Egyptian Journal of Aquatic Biology & Fisheries
Zoology Department, Faculty of Science,
Ain Shams University, Cairo, Egypt.
ISSN 1110 – 6131
Vol. 28(3): 1063 – 1072 (2024)
www.ejabf.journals.ekb.eg

Opportunities for Frozen and Processed Shrimps to Enter the Singaporian and Malaysian Markets

Muhammad Yusuf[1, *], Hardiwinoto[2], Torbjørn Trondsen[3], Diode Yonata[1], Boby Pranata[1], Nurul Puspita[2]

[1]University of Muhammadiyah Semarang, Faculty of Science and Agricultural Technology
[2]University of Muhammadiyah Semarang, Faculty of Economics and Business
[3]SIFT Group AS – Germany

***Corresponding Author: m.yusuf@unimus.ac.id**

ARTICLE INFO

Article History:
Received: May 29, 2024
Accepted: June 6, 2024
Online: June 21, 2024

Keywords:
Asean markets,
Frozen shrimp,
Opportunity processed shrimp

ABSTRACT

The primary export from the Indonesian fisheries sector is shrimp. Numerous shrimp businesses have established export destination markets in ASEAN nations, including Malaysia and Singapore, since their potential is comparable to that of the USA or Japan. This study was conducted from 2018 to 2022 to ascertain the Indonesia's competitiveness regarding shrimp export commodities in the Malaysian and Singaporean markets, in addition to enhancing the strategies with the aim of augmenting the competitiveness of Indonesian shrimp in international markets, particularly those of Malaysia and Singapore. The analysis techniques employed were the trade balance index (TBI), market size, and market share index to assess opportunity, and normalized revealed comparative advantage (NRCA) and comparative export performance (CEP) to assess competitiveness. The results showed that the Indonesian shrimps are competitive in the Singaporian and Malaysian markets but need improvement due to the intense rival competition.

INTRODUCTION

Products from the fishing industry are crucial to the development of the Indonesian economy. Due to its abundant fisheries resources and status as a maritime nation, Indonesia has prioritized the marine and fisheries industry for its economic growth. The demand for the Indonesian fisheries goods in the international market is positively impacted by the annually rising global consumption of fisheries products **(Yusuf *et al.*, 2018; Luhur *et al.*, 2019)**.

Shrimp is the leading export commodity for the Indonesian fishery products, with exports accounting for 35.84% of all fisheries products exported from Indonesia. Additionally, Indonesia's shrimp export performance increased between 2014 and 2018. While most commodities had a reduced and even negative export trend, the volume of shrimp exports climbed by 4.81%, just less than that of the cuttlefish-octopus commodity,

which surged by 18.92% **(MMAF, 2019)**. Currently, the USA and Japan are Indonesia's top export markets for shrimp **(UN Comtrade, 2020)**. Indonesia is a significant shrimp producer worldwide and is second behind China as the world's largest fishery-producing nation **(FAO, 2020)**. The export value of shrimp to the two largest destination countries, the United States and Japan, decreased significantly between 2017 and 2019 **(UN Comtrade, 2020)**. Low value-added products and more dynamic and competitive market conditions in terms of quality and quantity have contributed to the decline in the value of the Indonesian shrimp exports to significant countries **(Chasanah *et al.*, 2017; Ciffolilli & Muscio, 2018; Luhur *et al.*, 2019)**. This is in addition to the economic crisis currently affecting these countries, which has significantly impacted Indonesia's shrimp export performance.

In order to sustain the upward trajectory of Indonesia's shrimp export performance, it is imperative to expand into prospective markets and augment the quantity of high-value items offered. Expanding their markets to include the ASEAN area offers many lucrative trade and economic prospects for more all-encompassing and integrated businesses. The Indonesian shrimp goods are more straightforward to sell because of the economic connectivity among ASEAN member states. According to the data published by **UN Comtrade (2020)**, over the past five years, the US and Japan were formerly the main markets for the Indonesian fisheries exports; now, ASEAN countries like Malaysia and Singapore, together with many other East Asian countries, are the main buyers. The shrimp items are included in this **(Apridar, 2014)**.

Competitive nations control the market due to the free commerce in the international marketplaces **(Peneder & Streicher, 2018)**. A nation with high competition will have a higher chance of surviving and dominating the market. A competitiveness study is required to ascertain the status of the Indonesian shrimp exports. The tightening export rivalry is because other nations are manufacturing the same product with an equivalent quality.

Numerous research works have examined the competitiveness of various fisheries goods, including the tuna **(Apridar, 2014)**, live fish, frozen fish, and chilled fish **(Luhur *et al.*, 2019)**. These studies aimed to evaluate the products' standing in the ASEAN market. Regarding the Indonesian shrimp goods' competitiveness in the ASEAN market, especially in Malaysia and Singapore, not much information is accessible. Since shrimp is the main export commodity for the Indonesian fisheries products and Malaysia and Singapore are ASEAN countries with enormous potential, this study aimed to determine the competitiveness of the Indonesian shrimp commodities in the Malaysian and Singaporean markets.

MATERIALS AND METHODS

Data collection

This study used quantitative data from the United Nations Commodity Trade of export volume, the exports value, and imports of frozen shrimps (HS 030617) and processed shrimps (HS 160521) of Indonesia from 2018 to 2022.

Trade balance index (TBI)

TBI is a measure used to analyze the position or stage of development of a product, indicating the tendency of a country as an exporter or importer. TBI was simply formulated as follows:

$TBI = (X – M) / (X + M)$

Where, TBI= Trade balance index for the Indonesian crab products; X= Value of export of the Indonesian crab products; and M= Import value of the Indonesian crab products

TBI is an indicator to find out the pattern of trade and the stage of industrialization of a commodity based on the period. It aims to measure the performance of the commodity. The index value varies from -1 to +1. In extreme terms, TBI is equal to -1 if a country only imports, and vice versa; TBI is equal to +1 if a country exports and imports commodities simultaneously. A country is a net importer of certain products if the TBI value is negative, and as a net exporter if the TBI value is positive.

Normalized revealed comparative advantage (NRCA)

In this study, the modified RCA method is normalized revealed comparative advantage (NRCA). This method has several advantages including the ability of comparability between space and time. Additionally, the addition of NRCA results in stability, with values remaining consistent and equal to zero across different time periods and locations. This explains the meaning of the zero-sum imbedded in a comparative advantage: if a country gains a comparative advantage in one sector, the country will experience a loss of comparative advantage in other sectors; and if one country gains a comparative advantage in one sector, then another country will suffer a comparative advantage in the same sector. NRCA has the following formula:

$$NRCA = [E_{ij}/E_{REF}] – [(E_i \times E_{REFj}) / (E_{REF} \times E_{REF})]$$

Where, E_{ij}= denotes an export value of country i for commodity j; E_i= denotes total export value (of all "j") of country I; E_{REFj}= denotes export value of commodity j of the group of reference countries; and E_{REF}= denotes total export value (of all "j") of the group of reference countries.

The range of NRCA values is -0.25- 0.25, with a comparative advantage neutral (CAN) being zero. As an illustration, -0.25 < NRCAij < 0 indicates that the actual export of country i for commodity j is lower than the comparative advantage-neutral point, while 0 < NRCAij < 0.25 indicates that country i has a comparative advantage in commodity exports j **(Faridah, 2016)**.

Comperative export performance (CEP)

To evaluate a country's export specialization for a particular product, the comparative export performance (CEP) was used. If a country has a CEP value greater than one, the country has a relative advantage in its exports. The formula used for calculation is as follows:

$CEP = \ln (X_{ij}/X_j) / (X_{iA}/X_A)$

Where, X_{ij} is the export value of the country's crab commodity j (US $); X_j is the value of total country exports j; X_{iA} is the value of total world export of crab commodity; and X_A is the value of total world export.

Market size

To analyze the market size bottom-up approach was used. The bottom-up approach sizes a market using the projections of individual clusters. The first step was to identify the customer segments intended to reach, followed by making the estimates of their size and growth. The formula used for the calculation of the market size formula is as follows:

Market size = N x MS x P x Q

Where, N= total of potential consumers; MS= market share of potential consumers; P= average selling price, and Q= average product consumption/product purchases in a year.

Market share index (MSI)

MSI is the relative percentage of imports from several countries in a more specific sector with values ranging from 0- 100. The formula used for the calculation of MSI is as follows:

$MSI = (X_{iB}/M_{iw})$

Where, XiB is the country B's exports of product I, and Miw is the total imports of product i in the destination country. If a country does not have an export quantity of the product then it is valued at 0, but the value will reach 100 if only that country is the sole exporter of a product. A higher MSI reflects a larger market share controlled by the country.

Table 1. Data and analysis

Objective	Data type	Data analysis	Output
Analyzing the performance of exports of the Indonesian frozen shrimps and processed shrimps on the international market	Data on export and import of the Indonesian frozen shrimp and processed shrimp from 2018-2022	Trade balance index (TBI)	The trading position of the Indonesian frozen shrimp and processed shrimp
Analyze the competitiveness through a comparative advantage approach	Data on Indonesian frozen shrimp and processed shrimp exports in 2018 – 2022	Normalized Revealed Comparative Advantage (NRCA). Comparative Export Performance (CEP)	The NRCA value of Indonesian frozen shrimp and processed shrimp in international markets indicates market share, and CEP to know specialization product
Analyze the market size to enter Singaporean and Malaysian Markets	Data on Singapore and Malaysia of frozen shrimp and processed shrimp in 2018 – 2022	Market size and Market share Index	Opportunities for Indonesian frozen shrimp and processed shrimp to enter Singapore and Malaysia markets

RESULTS AND DISCUSSION

1. Trade position of the Indonesian frozen shrimp and processed shrimp

The food trade poses an interesting case study of unit values with its diverse array of products and associated varying levels of quality. The trade balance includes exports and imports of goods. If the export of goods is greater than the import of goods, then the trade balance surplus is said to occur. Conversely, if the import of goods is greater than the export of goods, this is called the trade balance deficit **(Gehlhar & Pick, 2001; Basri, 2010)**. From 2018 until 2022, the trade balance of the Indonesian frozen shrimps (HS 030617) and processed shrimps (HS 160521) has fluctuated, as seen in Table (2).

Table (2) shows that Indonesia exports large quantities of frozen shrimp and processed shrimp, reaching an average of 154 million and 38 million kilograms per year, respectively. The number of exports also shows very rapid development of these two products, increasing by 25 million kg each from 2018 to 2022. It can be concluded that Indonesia is experiencing a trade balance surplus in the frozen shrimp and processed shrimp products since the amount of imports is far less than the number of exports (Table 2). Given that the domestic shrimp consumption is barely 5% of the country's total

production **(Wati, 2017)**, Indonesian shrimp export operations are positively impacted by the country's continued growth in the shrimp production.

Table 2. Export and import volume of the Indonesian frozen shrimp and processed shrimp

Year	Volume (Kg)			
	HS 030617		HS 160521	
	Export	Import	Export	Import
2018	142,374,145	1,111,742	26,178,501	38,591
2019	148,507,595	636,481	29,777,102	45,996
2020	149,146,196	2,086,391	34,525,634	82,803
2021	163,941,006	2,373,712	48,615,054	86,633
2022	167,124,206	4,506,151	52,983,677	39,059

Source: **UN Comtrade, 2022**.

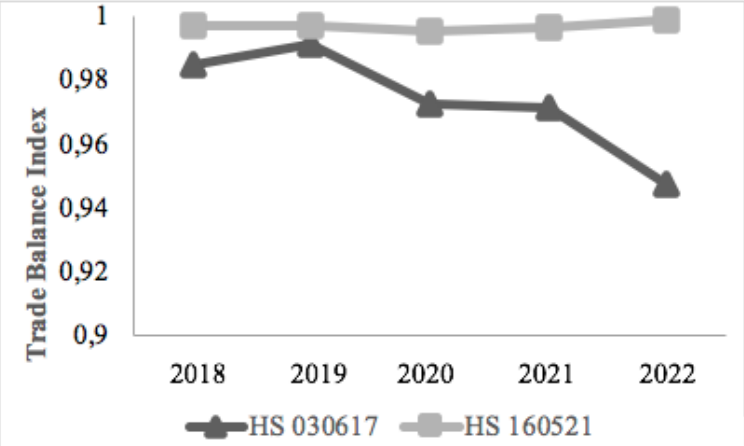

Fig. 1. Trade balance index (TBI) of the Indonesian frozen shrimp and processed shrimp

The TBI value of the Indonesian frozen and processed shrimp products remained stable at 0.9, which indicates that these two products are highly competitive in the international market. If the TBI value is between 0.8 and 1, it can be concluded that the product is in the maturity stage and has high export competitiveness **(Lubis, 2013)**.

2. Comperative advantage of the Indonesian frozen shrimps and processed shrimps

Indonesia is one of the leading exporters of frozen and processed shrimp products to various countries worldwide, especially for products with HS 030617 and HS 160521 codes. Indonesia always occupies the top 5 positions in the exports of these two products. Indonesia's comparative values are illustrated in Fig. (2).

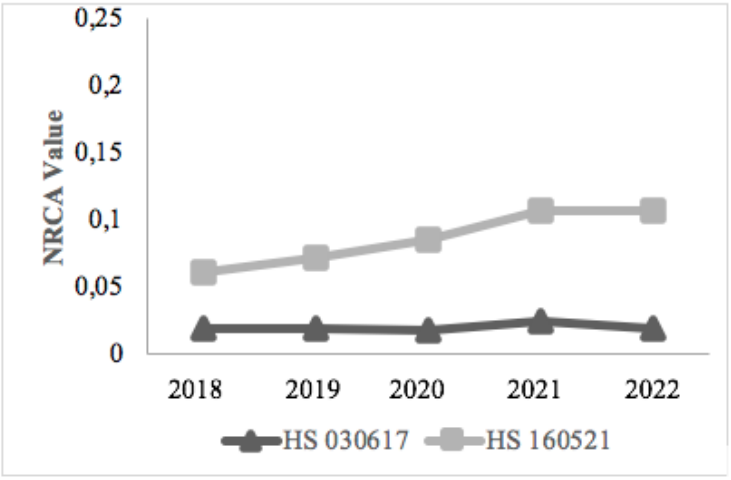

Fig. 2. NRCA value of the Indonesian frozen shrimp and processed shrimp

The NRCA value of the Indonesian processed shrimp products has increased every year. For the frozen shrimp products, although they did not increase, they tended to be stable at above 0. It can be concluded that the frozen shrimp and processed shrimp products have a comparative advantage. Nevertheless, the comparative advantage of the frozen shrimp products needs attention, especially from the government, which has an important role in export policy **(Tuna, 2016)**. The government must prepare a program to increase innovation, adoption, and technology to improve shrimp production and quality. Improved quality will increase the selling price per kilogram of the processed crab. Consequently, a higher price is offered, resulting in an increase in the export value. Increasing the value of exports will increase the comparative advantage of these commodities **(Khasanah *et al.*, 2019)**.

Table 3. CEP value of Indonesian frozen shrimp and processed shrimp

Year	CEP	
	HS 030617	**HS 160521**
2018	1.163	1.714
2019	1.155	1.998
2020	1.151	2.151
2021	1.182	2.499
2022	1.157	2.419

Table (3) shows that the CEP value of the Indonesian frozen shrimp products ranges from 1.151 to 1.182, while for processed shrimp products, it ranges from 1.714 to 2.499. The CEP value of these two products also shows a very good value (> 1), which can be interpreted as indicating that Indonesia has a competitive value and specializes in the export of the frozen and processed shrimp products.

3. Oppotunities of the Indonesian frozen shrimp and processed shrimp to entering the Singaporian and Malaysian markets

Singapore is a potential destination for shrimp exports. Its average market size is USD 98 million for the frozen shrimp products and USD 45 million for the processed shrimp products. Malaysia is also a potential export destination for the frozen shrimp, with an average market size of USD 41 million. However, Malaysia's market size is only USD 1 million for the processed shrimp products. For a more complete market size, data for Singapore and Malaysia are shown in Table (4).

Table 4. Market size of the frozen shrimp and processed shrimp

Year	Market size (USD)			
	Singapore		**Malaysia**	
	HS 030617	**HS 160521**	**HS 030617**	**HS 160521**
2018	100,382,753	59,475,831	33,415,813	4,634,056
2019	97,550,057	53,393,657	37,284,075	1,825,921
2020	100,141,714	46,423,600	48,629,626	655,238
2021	80,813,107	32,667,652	40,798,949	240,749
2022	113,948,241	36,024,038	46,573,449	52,686

The market share for the Indonesian shrimp products in Singapore still has the opportunity to increase due to the enormous market potential. Indonesia currently controls a market share ranging between 13.477 and 15.688% for the frozen shrimp products, and between 4.925 and 13.898% for the processed shrimp products. Apart from that, for the Malaysian market, the frozen shrimp products still have the potential to be increased since they only control 8.281– 12.046% of the market shares. For the processed shrimp products, Indonesia has managed to dominate Malaysia's market share. It was even recorded that in 2021, Indonesia was almost the sole exporter with a very high MSI value of 90.893. The market share index of the Indonesian frozen shrimp and processed shrimp can be seen in Table (5).

Table 5. Market share index of Indonesian frozen shrimp and processed shrimp

Year	Market share index			
	Singapore		**Malaysia**	
	HS 030617	**HS 160521**	**HS 030617**	**HS 160521**
2018	15.411	4.925	9.169	62.445
2019	14.760	6.372	12.046	52.365
2020	13.447	7.576	8.280	64.543
2021	15.688	13.482	9.550	90.893
2022	12.506	13.898	8.281	55.355

CONCLUSION

The shrimp products with the HS codes 030617 and 160521 exhibit significant competitiveness, indicated by the TBI, NRCA, and CEP index study. The market share and size indexes of Singapore and Malaysia indicate significant potential for the Indonesian shrimp exports to these countries. Considering its favorable competitive position, it is quite possible that Indonesia will start to turn to ASEAN nations, particularly Malaysia and Singapore, to become important export destinations, particularly for the shrimp exports.

ACKNOWLEDGEMENTS

The research team would like to thank the Institute for Research and Community Service at the Universitas Muhammadiyah Semarang for funding this research.

REFERENCES

Apridar. (2014). The Competitiveness of Indonesian Tuna Export Facing The ASEAN Economic Community. Aceh International Journal of Social Sciences. 3(1): 1-13

Basri and **Munandar.** (2010). Fundamentals of International Economics: Introduction and Application of Quantitative Methods. Jakarta (ID): Kencana Prenada Media Group

Chasanah, N.; Mulyo, J. H. and **Darwanto, D. H.** (2017). Competitiveness and Export Similitary of Indonesian Horticulture in the ASEAN. Agro Ekonomi. 28(1): 32-47

Ciffolilli, A., and **Muscio.** (2018). An Industry 4.0: National and Regional Comparative Advantages in Key Enabling Technologies. European Planning Studies. 26(12): 2323-2343.

Faridah, S. (2016). Analysis of Performance and Competitiveness of Exports of Indonesian Seaweed on the World Market. Journal of Bogor Agricultural Institute.

Food Agriculture Organization. (2020). The State of World Fisheries and Aquaculture. Sustainability in Action. Rome. https://doi.org/10.4060/ca9229en. (accessed January 2020)

Gehlhar, M. and **Pick, D.** (2001). Food trade balances and unit values: What can they reveal about price competition?. Agribusiness. 18. 61-79. 10.1002/agr.10007.

Khasanah, U.; Huang, W. C. and **Asmara, R.** (2019). Indonesia Frozen and Processed Crab Export Performance and Competitiveness Analysis. Agricultural Socio-Economics Journal. 19(3): 165-171.

Lubis, A. (2013). Competitiveness, trade performance, and the liberalization impact of forestry products. 7(1): 37 –53.

Luhur, E. S.; Mulatsih, S. and **Puspitawati, E.** (2019). Competitiveness Analysis of Indonesian Fishery Products in The ASEAN and Canada Markets. Signifikan: Jurnal Ilmu Ekonomi. 8(1): 105-120.

MMAF (Ministry of Marine Affairs and Fisheries). (2019). Annual report of Ministry of Marine Affairs and Fisheries 2019. (accessed on July 2022)

Peneder, M. and **Streicher, G.** (2018). De-Industrialization and Comparative Advantage in the Global Value Chain. Economic System Research. 30(1): 85-104.

Tuna, E. (2006). The Tobacco Sector in The Republic of Macedonian-Competitiveness Analysis. Degree Thesis, Business Administration, Sveriges Lantbruksuniversitet.

UN Comtrade (United Nations Commodity Trade Statistics Databes). https://comtrade.un.org. (accessed May 2022).

Yusuf, M.; Legowo, A. and Agustini, T. W. (2018). Analysis Five Competitive Forces Model: Study Fisheries Industry in Semarang and Jepara – Indonesia. International Journal of Management and Applied Science., 4(7): 90-94.