

CITATION: Khasanah U., Huang W., C., & Asmara, R. (2019). Indonesia Frozen and Processed Crab Export Performance and Competitiveness Analysis. *Agricultural Socio-Economics Journal*, 19(3), 165-171.
DOI: <http://dx.doi.org/10.21776/ub.agrise.2019.019.3.5>

were indirectly involved in this industry (Supartono, 2013).

Growth of export value in 2016-2017, shrimp is Indonesia's most successful fishery product after that TTC or Cakalang tuna take second place and crabs are in third position. The highest increase in export value was crabs by 27.8%, while other trades fell by 10.03%. Crab takes the top position after shrimp and TTC shows that crabs have high export potential because Indonesia as a maritime country with extensive competitive regions can produce high-quality crabs. Crabs are the most significant among the others. Increasing the volume of Indonesian crab export supply will affect Indonesia's growth, and increase Indonesia's foreign exchange. For this reason, it is necessary to know the factors that will affect the demand for commodity exports of crabs in the international market.

The top 3 main destinations in crab exports include the United States, China, Hong Kong. While competing top 3 countries are Vietnam, Philippines, Korea. Even though Indonesia has the competitiveness of crab exports, there are some whose values are below competing countries (BPS, 2019).

This study used two codes for the crab products: the first is frozen crab (HS 303614) and the second is processed crabs in cans (HS 160510).

The issue of export performance of Indonesian crabs is investigated in this study.

RESEARCH METHODS

This study uses annual time series data for 18 years, from 2000 to 2017. The data analyzed consisted of export volume, the exports value, and imports of frozen crabs (HS 030614) and processed crabs in cans (HS 160510) of main exporter countries (Indonesia, Philippines, Vietnam, China, Korea).

Data sources were obtained from the Central Statistics Agency (BPS), Cultivation Fisheries Statistics (Directorate General of Aquaculture, KKP), United Nation Commodity Trade (UN COMTRADE), Trade Map / ITC, Trading Economics, Ministry of Trade, Bank Indonesia and other agencies.

This study uses the quantitative method with the Normalized Revealed Comparative Advantage (NRCA) approach is used to analyze comparative advantage and to find out whether these specialized commodities are analyzed by the Export Performance Comparative (CEP) Index, to analyze the performance of crab product exports using the Trade Balance Index (TBI). Data used and analysis show in Table 1.

Table 1. Data and analysis

Objective	Data Type	Data analysis	Output
Analyzing the performance of exports of Indonesian crab products on the international market	Data on export and import of crab products from 2000-2017	Trade Balance Index (TBI)	The trading position of Indonesian crab products
Analyze the competitiveness through a comparative advantage approach	Data on Indonesia's total crab exports and in 2000 – 2017	Normalized Revealed Comparative Advantage (NRCA). Comparative Export Performance (CEP)	The NRCA value of Indonesian crab products in international markets indicates market share, and CEP to know specialization product

Normalized Revealed Comparative Advantage (NRCA)

This study, the modified RCA method is *Normalized Revealed Comparative Advantage* (NRCA) where this method has several advantages including the ability of comparability between

space and time, where the addition of NRCA is stable and equal to zero between time and space and stable at the flat. This explains the meaning of the *zero-sum imbedded in comparative advantage*: if a country gains 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:

$$NRCA = \frac{\Delta X_{ij}}{X_w} = \frac{X_{ij}}{X_w} - \frac{X_{wj}X_i}{X_wX_w}$$

Where X represents the export value, index *i*, *w*, and *j* each shows the aggregate of exports at the state, regional or world level, and commodities. The range of NRCA values is (-0.25) -(0.25) with Comparative Advantage Neutral (CAN) being zero. As an illustration, $-0.25 < NRCA_{ij} < 0$ indicates that the actual export of country *i* for commodity *j* is lower than the comparative advantage-neutral point, while $0 < NRCA_{ij} < 0.25$ 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, it is calculated using the Comparative Export Performance (CEP). If a country has a CEP value greater than one, the country has a relative advantage in its exports. Fortunately, the formula used is calculated as follows:

$$CEP = \ln \left(\frac{X_{ij}}{X_j} \right) / \left(\frac{X_{iA}}{XA} \right)$$

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, XA is the Value of Total World Export, State *j* includes 1) Indonesia, 2) Philippines 3) China, 4) Korea 5) Vietnam as for the Total World Exports it is only limited to the scope of Asia which is represented by only four countries, namely Indonesia, the Philippines, China, Korea, Vietnam.

Trade Balance Index (TBI)

TBI is a measure used to analyze the position or stage of development of a product so that it can be seen the tendency of a country as an exporter or importer. TBI is simply formulated as follows:

$$TBI = (X - M) / (X + M)$$

Where:

TBI = Trade balance index for Indonesian crab products

X = Value of export of Indonesian crab products

M = Import value of 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, so that the performance of the commodity can be measured. 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.

According to the Ministry of Trade in (Lubis, 2013) specifically TBI will identify the growth rate of a product in trade into the following 5 stages:

- The introduction stage, if the TBI value is between -1 and -0.50. A product can be introduced into a country through imports, domestic consumption develops slowly and domestic products are still simple.
- Import substitution stage, if the TBI value is between -0.50 to 0.00. Domestic products began to replace imported goods, the value of imports began to decrease, exports began to increase.
- Growth stage, if the TBI value is between 0.01 and 0.80. at this stage export competition becomes tighter.
- Maturity stage, if the TBI value is between 0.81 to 1.00. at this stage exports have high competitiveness.

RESULTS AND DISCUSSION

The main exporting country is the export of product processed crab in cans (HS 160510), are China, Indonesia and Philippines. As for frozen crab products (HS 030614), are Canada, Russia and China. Indonesia is not in the top 3 frozen export crab countries; this is because the Indonesian processing industry already has a market share of 90% of processed product exports. Table 2 is the biggest crab export country in 2017 (Uncomtrade, 2019).

Table 2. Top three crabs export countries in 2017

Processed crab in cans-(HS 160510)		Frozen crab (HS 030614),	
Countries	Value (USD)	Countries	Value (USD)
China	736,999,612	Canada	1,017,672,232
Indonesia	197,634,344	Russia	556,322,407
Vietnam	68,909,168	China	317,335,415

Balance of trade in Indonesian crab products

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, then this situation is called the trade balance deficit (Basri, 2010). Since 2016 until 2018 the trade balance of crab products has fluctuated as illustrated in Table 3 (Uncomtrade, 2019).

Table 3. Export and Import Volume of crab products

HS Code	Information	Volume (Kg)		
		2016	2017	2018
160510	Export	17,039,194	10,324,000	13,546,894
	Import	419,697	102,800	50,040
030614	Export	3,296,040	2,210,187	1,249,786
	Import	4,602,253	4,631,431	5,516,558

Source: UN Comtrade, 2019

From Table 3, it shows that the number of exports of processed crab in cans products increased in 2018 and is greater than frozen products, and also the number of imported processed crab in cans products is smaller than frozen. Decreasing frozen crab exports and Increasing imports of frozen crab products indicate that consumption of frozen crabs in Indonesia is increasing.

Trade position of processed crab in cans products and frozen Indonesian crabs

Indonesian crab processed products crab in cans tend to be exporters. While frozen crab products tend to be importers. The TBI value of frozen crab products tends to decrease from 2009. It can be seen in Figure 2.

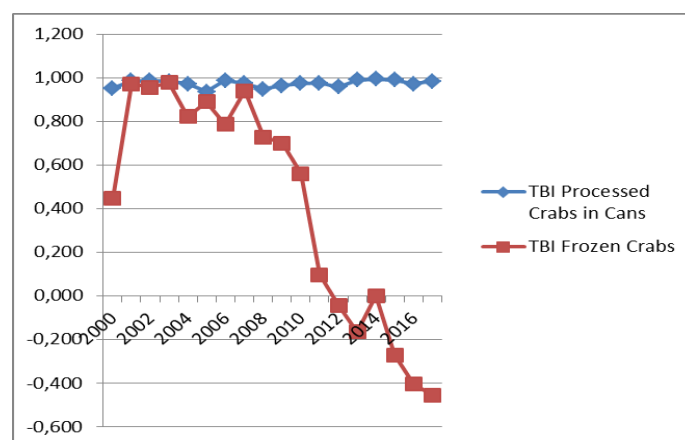


Figure 2. Trade Balance Index (TBI) of Indonesian crab products

Figure 2 show about value TBI of crab in cans product and frozen crab product. The value of crab in cans is stable around 0.9, indicate Indonesia in maturity stage and this stage exports have high competitiveness.

Comparative Advantage of Indonesian crabs

Comparative advantages Indonesian processed crab in cans products (HS 160510)

Countries with the highest export value of HS 160510 in 2017 are Indonesia, China and Vietnam. The NRCA value of Indonesian processed crab in cans products tends to be larger than other countries. The following is the calculation of the NRCA value of Indonesian crab processed products shown in Figure 3.

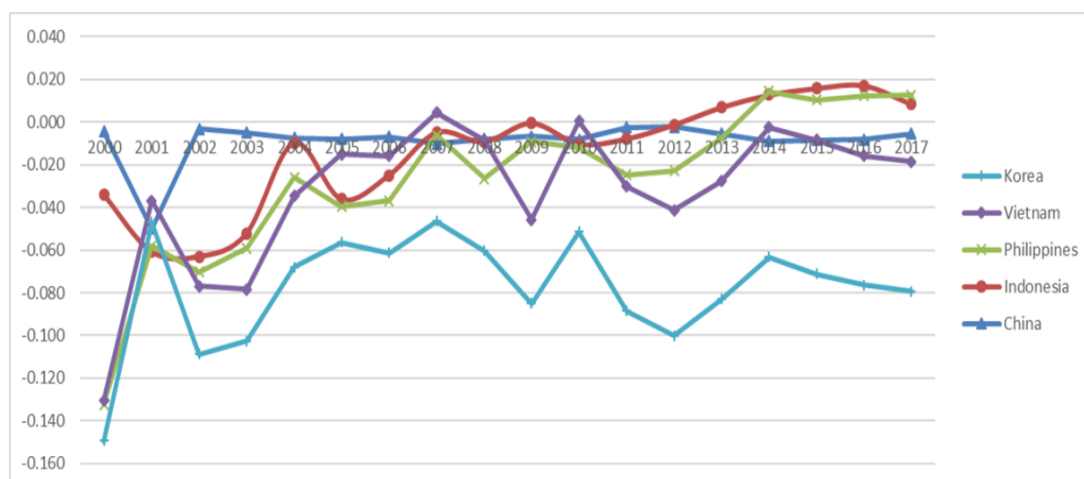


Figure 3. NRCA value of Indonesian processed crab in cans products

The NRCA value of Indonesian processed crab in cans products tends to increase and above zero (0), indicating that processed crab in cans products have comparative advantages. However, the value of the NRCA of Indonesian crabs in Figure 3 is still low and needs to be increased again with more sales and quality. Quality improvement will increase the selling price per kilogram of processed crabs. Thus, the price offered is higher and the export value is higher. The increase in export value will increase the comparative advantage of these commodities. Indonesia's opportunity to improve the comparative advantage of crabs is very large because Indonesia still has not maximized the management of crabs. Distribution of crab product as shown in figure 4:

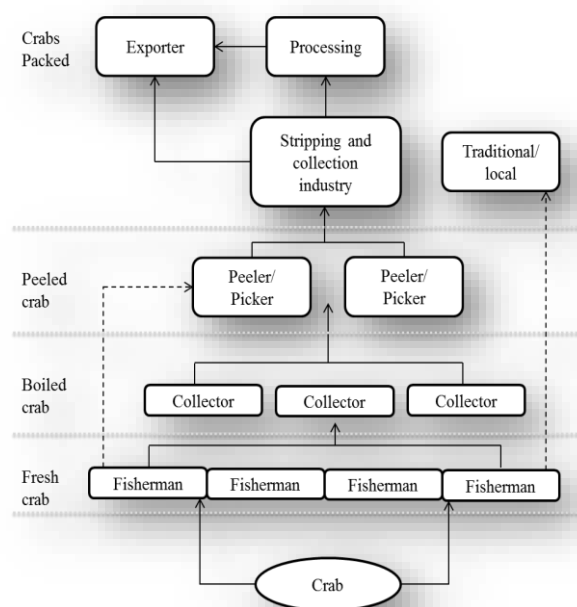


Figure 4. Distribution of crab product Source. Minister of Marine and Fisheries of The Republic of Indonesia, 2015

Table 4. CEP value of Indonesian crab processed products

Year	China	Indonesia	Philippines	Vietnam	Korea
2013	-0,057	1,151	0,697	0,307	-1,112
2014	-0,160	1,431	1,145	0,368	-1,274
2015	-0,147	1,539	0,942	0,284	-1,310
2016	-0,138	1,555	0,953	-0,034	-1,253
2017	-0,055	1,225	1,193	-0,144	-1,276

From the table above, showing the CEP value of Indonesia from 2013-2017 which is above 1, it can be explained that Indonesia is a country that is specialized in managing the production and export of processed crab products.

Comparative advantages Indonesian frozen crab products (HS 030614).

The NRCA value of China tends to be more stable compared to Indonesia. The NRCA value of Indonesia's frozen crabs tends to decline from 2014. The decline in frozen crab exports is due to the import value of frozen crabs higher than the value of exports in recent years. The NRCA value of frozen crabs can be seen in Figure 5.

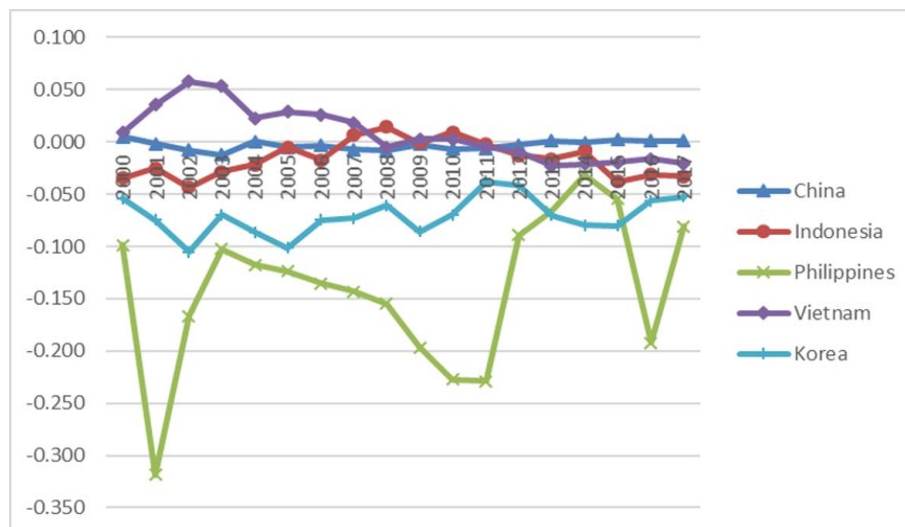


Figure 5. NRCA value of Indonesian frozen crab products

Figure 5 show about value NRCA of Indonesia frozen crab is minus from 2011. That indicates that Indonesia is less competitive in frozen crab products. but this must be considered because the consumption of frozen crabs in Indonesia is increasing, as evidenced by the higher import value

each year. The specialization of frozen crab products shown in Table 5.

This table show about value of CEP Indonesia more less than China and Vietnam. Indonesia's CEP value is very volatile. Indicates that Indonesia is less specialized in frozen crab products.

Table 5. CEP value of Indonesian frozen crab products

Year	China	Indonesia	Philippines	Vietnam	Korea
2013	0,134	0,419	-0,656	0,322	-1,489
2014	0,093	0,650	0,330	0,334	-1,758
2015	0,167	-0,169	-0,364	0,336	-1,771
2016	0,128	0,036	-4,293	0,404	-1,065
2017	0,141	-0,014	-1,116	0,249	-0,961

CONCLUSION

The performance of trade in Indonesian crab commodities in international markets is seen through the trade balance and the Trade Balance Index. Based on the trade balance, the export growth of processed crab products per year has increased and conversely imports have decreased. While the frozen crab products exported by Indonesia have decreased. Furthermore, trade performance is seen from the position of trading in crab products using the TBI method. The results of the analysis state that of the two crab products, processed crabs are at the maturity stage. While frozen crabs are at the stage of growth.

The comparative advantage of crab commodities was analyzed using NRCA. The result of the analysis is that processed crabs in can have a comparative advantage of positive NRCA values of more than 0. However, the NRCA value of frozen crab products in the past few years is minus. Supported by the CEP value, from the two products only processed crab products with values above 1, which means Indonesia is specialized and more competitive in processed crab products.

REFERENCES

- Basri and Munandar. 2010. Fundamentals of International Economics: Introduction and Application of Quantitative Methods. Jakarta (ID): Kencana Prenada Media Group
- Bureau Central Statistic. 2019. *Data Statistical export by commodity*. <https://www.bps.go.id/statictable/2014/09/08/1020/ekspor-kepiting-dan-kerang-kerangan-menurut-negara-tujuan-utama-2002-2015.html> access on 11 march 2019.
- Faridah, S. 2016. Analysis of Performance and Competitiveness of Exports of Indonesian Seaweed on the World Market. Journal of Bogor Agricultural Institute.
- Lubis A. 2013. Competitiveness, trade performance, and the liberalization impact of forestry products. [internet]. [access on 11 march 2019]; 7(1): 37 – 53. Available: <http://www.kemendag.go.id/files/pdf/2014/04/08/-1396957677.pdf>
- Marine and Fisheries Ministry. 2017. Value Export Main Commodity. (online), <https://kkp.go.id/wp-content/uploads/2018/01/KKP-Dirjen-PDSPKP-FMB-Kominfo-19-Januari-2018.pdf> , access on 10 March 2019
- Supartono and Putri. 2015. *Analysis of Rejection of Indonesian Rajungan (Portunus pelagicus) and Crab (Scylla serrata) Export Products in the United States of America 2002-2013*. Proceedings of the Agro-Industry Seminar and FKPT-TPI National Workshop
- UN COMTRADE. 2019. *Statistical volume export-import by commodity 2016-2018*, (internet) <https://comtrade.un.org/data/> access on 10 march 2019.
- UN COMTRADE. 2019. *Statistical Year Book 2017 by commodity*. (internet), <https://comtrade.un.org/data/> access on 10 march 201