

Analysis of Trade Specialization and Competitiveness of Indonesian Coconut Oil in the International Market (2010-2020)

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Abstract

Processed coconut products are one of Indonesia's leading export commodities. Coconut can be processed into several products including coconut milk, copra, and coconut oil. In this study researchers focused on processed coconut products in the form of coconut oil, namely crude coconut oil with HS code 151311 and virgin coconut oil with HS code 151319. The researcher conducted an analysis of the trade specialization and competitiveness of Indonesian coconut oil in the international market. A quantitative research method was deployed in this study with secondary data obtained from several sources relevant to the topic of this research, such as the United Nations Commodity Trade, Statistics Indonesia, the Ministry of Agriculture of the Republic of Indonesia and the Ministry of Trade of the Republic of Indonesia. The data analysis method used in this study is the Trade Specialization Index (TSI) which is used to analyze the trade specifications of Indonesian coconut oil and Revealed Comparative Advantage (RCA) which is used to analyze the comparative competitiveness of Indonesian coconut oil. The results in this study are the trade specialization of Indonesian coconut oil is at the maturity stage which means Indonesia tends to be a coconut oil-exporting country, with a TSI value of Indonesian crude coconut oil (0.94) and Indonesian virgin coconut oil (0.99). The results of the RCA research also show positive things for Indonesian coconut oil, where crude coconut oil and virgin coconut oil get an RCA value of more than 1 which means Indonesian crude coconut oil and Indonesian virgin coconut oil have comparative advantages and strong competitiveness in the international market with the average RCA value of crude coconut oil (30.67) and virgin coconut oil (27.07).

Keywords

RCA, TSI, Competitiveness, Exports, Coconut Oil, Indonesia

1. Introduction

The development of the dynamics of people's lives and the economy of countries, causes every country to be integrated with each other without state territorial boundaries. The ease of exchanging information, exchanging services and goods, technology and science makes the countries of the world into a single entity, which needs each other. This process is also known as globalization. Globalization can occur in various fields such as the fields of culture, education, politics, and economics. One of the effects of globalization in the economic field is the development of a free trade system. Free trade is associated with the absence of quotas, tariffs, or other barriers in international trade. This allows each country to specialize in the goods produced, making it cheaper and more efficient than competing countries, thus allowing each country to get higher real income (Irwin, 2019). Indonesia is one of the countries that cannot be separated from international trade in its economy, becoming an agricultural country. The agricultural sector is one of the leading export products in Indonesian international trade and has a large contribution to Indonesia's GDP. The contribution of agriculture to GDP in the third quarter amounted to 571.87 trillion rupiahs, up 14.68% from the same period in the previous year. This cannot be separated from the export contribution of the Indonesian plantation sub-sector, recorded in the January-October 2020 period of 359.5 trillion rupiahs, an increase of 11.6% compared to the same period in 2019 of 322.1 trillion (Directorate General of Plantation, 2020). This is due to the large demand for plantation commodities such as palm oil, cocoa, rubber, cloves, and Indonesian coconut.

Indonesian coconut is one of the export commodities from the Indonesian plantation sub-sector. Coconut is processed into several products, one of which is crude coconut oil and virgin coconut oil. The trade balance of Indonesian crude coconut oil and virgin coconut oil is always a surplus every year. **Table 1**, describes the Indonesian crude coconut oil trade balance and the Indonesian Virgin Coconut Oil trade balance. In 2020 Indonesia's crude coconut oil exports were as follows, Malaysia amounted to 110,458,880 Kg (41%) of the total export of Indonesian crude coconut oil, Netherlands amounted to 82,075,480 Kg (31%), Sri Lanka at 29,660,610 Kg (11%), USA 28,002,070 Kg (10%), Thailand at 10,956.154 Kg (4%) and other importing countries of Indonesian crude coconut oil (2%). Meanwhile, the main export destination countries for virgin coconut oil are China at 87,378,730 Kg (28%), USA at 72,772,004 Kg (23%), Rep. of Korea by 33,695.874 Kg (11%), Singapore by 21,857,834 (7%), Russian Federation by 18,291,204 Kg (25%). Other importing countries of Indonesian virgin coconut oil are 77,060,582 Kg (25%) (Trade, 2021).

Based on **Table 1**, from 2016-2020 Indonesia's exports of crude coconut oil and virgin coconut oil are always more than the value of imports of crude coconut oil and virgin coconut oil or in other words, the trade balance of Indonesian crude coconut oil and virgin coconut oil is always in surplus every year. Even

Table 1. Indonesia's crude coconut oil and virgin coconut oil trade balance.

Indonesian Crude Coconut Oil			
Years	Indonesian crude coconut oil exports (USD)	Indonesian crude coconut oil imports (USD)	Crude coconut oil trade balance (USD)
2016	391,060,701	9,196,564	381,864,137
2017	359,974,956	12,782,396	347,192,560
2018	354,757,999	15,920,721	338,837,278
2019	188,135,258	20,229,843	167,905,415
2020	236,329,882	38,135,316	198,194,566
Indonesian Virgin Coconut Oil			
Years	Indonesian virgin coconut oil exports (USD)	Indonesian virgin coconut oil imports (USD)	Virgin coconut oil trade balance (USD)
2016	425,094,043	817,837	424,276,206
2017	456,990,573	1,365,280	455,625,293
2018	368,116,563	959,897	367,156,666
2019	255,130,693	4,927,840	250,202,853
2020	309,408,900	3,453,493	305,955,407

Source: UN Comtrade (Processed).

though the number of exports during the last five years has decreased, crude coconut oil from 2016 had a surplus of 381,864,137 USD, decreased to 198,194,566 USD in 2020 or decreased by -48% while virgin coconut oil in 2016 had a surplus of 424,276,206 USD and decreased to 305,955,407 USD in 2020 or decreased by -28% .

This should be a concern for the Indonesian government and the relevant policy-making actors, why the level of exports of these two commodities has tended to decline over the last five years. How is the competitive position of crude coconut oil and virgin coconut oil with other producing and exporting countries, whether these two commodities have the ability to compete in the international market and whether Indonesia tends to be an exporting or importing country for crude coconut oil and virgin coconut oil, this is what underlies researchers to conduct research on trade specialization and competitiveness of Indonesian coconut oil, this study contributes to providing analysis and discussion on trade specialization and the competitiveness of Indonesian coconut oil (crude coconut oil HS Code 151311 and virgin coconut oil HS Code 151319) by comparing trade specialization and competitiveness Indonesian coconut oil with some of the largest coconut oil producing and exporting countries in the world.

This research has a structure which is divided into 6 sections, each section has its own explanation and purpose. The first section is introduction. This section explains a little about Indonesian coconut oil and the reasons why researchers chose to analyze Indonesian coconut oil. The second section is overview of In-

donesian coconut oil, providing an overview of the area of Indonesian coconut plantations, coconut oil exports, and the price of Indonesian coconut oil in the international market. The third section, namely literature review, this section discusses several literatures from previous researchers that are relevant to this research. The fourth section, methodology and data, describes the sources of data obtained and the methodology used in the study. The fifth section, result and discussion, this section is the result of data analysis that has been processed and analyzed. The sixth conclusion and recommendation, this section is a conclusion from what has been analyzed previously, and suggestions from researchers for Indonesian coconut oil.

2. Overview of Indonesian Coconut Oil

2.1. Development of Indonesia's Coconut Plantation Area

Coconut plantations in Indonesia are divided into three based on their ownership, namely Householder Estate, Government Estate and Private Estate. On average, the largest contribution was owned by Householder Estate around 98.94%, the Private Estate at 0.95%, and Government Estate at 0.11% (*Indonesian Agricultural Data Center and Information System, 2019*). The area of Indonesian coconut plantations is spread across various provinces in Indonesia, based on Indonesian statistical data in 2020, Riau Province is the province with the largest coconut plantation area in Indonesia of around 417.296 Hectares, followed by North Sulawesi 272.277 Hectares and East Java around 251.169 Hectares (*Directorate General of Estate, 2021*). However, based on Statistics Indonesia, the total area of Indonesian coconut plantations tends to experience a downward trend which will be shown in **Figure 1**.

The land area of Indonesian coconut plantations tends to have a downward trend with the largest decline occurring in 2017 with an area of 3473.2 thousand hectares, a decrease of 5.2% from 2016 with a land area of 3653.7 thousand hectares, seen in total from 2011 to 2020 the decline reached 10% from 3767.7 thousand Hectares to 3396.8 thousand Hectares in 2020. This of course can affect the production volume of various types of processed coconut products, one of which is coconut oil, when production decreases, of course, will affect the volume of exports of various types of processed coconut products, so the Indonesian government must pay attention, evaluate and maintain coconut plantations so that coconut processed products can still compete and become Indonesia's leading export commodity.

2.2. Development of Indonesian Coconut Oil Exports

In this study, the coconut oil studied was crude coconut oil (HS Code 151311) and virgin coconut oil (HS Code 151319). **Figure 2** describes the development of Indonesia's exports of crude coconut oil and virgin coconut oil.

Based on **Figure 2**, Indonesia's exports of crude coconut oil 2010-2020 tend to fluctuate, the highest decline in Indonesia's crude coconut oil exports was in

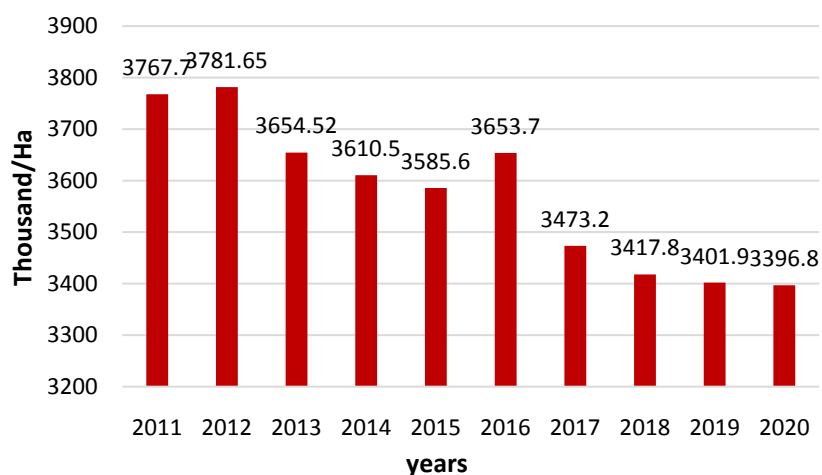


Figure 1. Indonesian coconut plantation area 2011-2020 (Thousand/Ha).

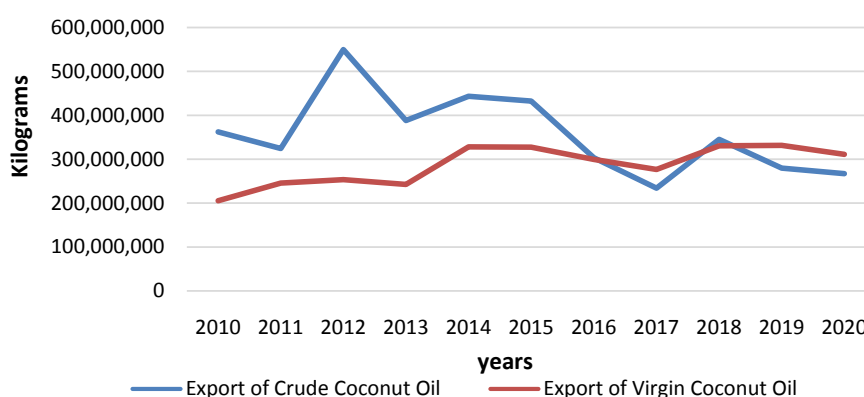


Figure 2. Export of Indonesia crude coconut oil and virgin coconut oil in 2010-2020 (Kilograms).

2013 which was -29% , from 2012 amounting to 549,577,914 Kg to 388,057,755 Kg, and the highest increase in exports occurred in 2012 amounting to 69% from 324,244,127 Kg in 2011 to 549,577,914 Kg in 2012 and this became the highest Indonesian crude coconut oil export during 2010-2020, and the lowest in 2020 Indonesia's crude coconut oil export was only 266,992,046 Kg. Indonesia's exports of virgin coconut oil 2010-2020 tend to fluctuate and tend to experience an upward trend, the highest increase in Indonesia's virgin coconut oil exports was in 2014 by 35% from 242,509,986 Kg in 2013 to 328,150,647 Kg in 2014 and a decline in exports for virgin coconut occurred, in 2016 which was -9% from 327,252,667 Kg in 2015 to 299,324,644 Kg in 2016. The highest export of virgin coconut oil occurred in 2014 at 328,150,647 Kg and the lowest occurred in 2010 at 205,308,700 Kg.

In comparison to Indonesia with other producing and exporting countries, the average number of exports of crude coconut oil and virgin coconut oil in 2010-2020 is in the second position after the Philippines with an average difference in exports of crude coconut oil of 175,699,403 Kg, and an average difference

of 175,699,403 Kg. The export of virgin coconut oil to the Philippines is 7,218,609 Kg, as shown in **Figure 3**.

2.3. The Development of Indonesian Coconut Oil Export Prices

From 2010 to 2020, the price of Indonesian coconut oil in the international market tends to fluctuate, for the export price of Indonesian crude coconut oil in the international market, the highest in 2011 was 1.64 USD/Kg and the lowest crude coconut oil price in 2019 was 0.67. USD/Kg with the lowest price decline occurred in 2018 with a difference in price decline of -51% from the previous year, and the highest price increase occurred in 2011 with a difference in price increases of 65% from the previous year. The highest export price of Indonesian Virgin coconut oil in the international market occurred in 2011 at 1.66 USD/Kg and the lowest in 2019 at 0.77 USD/Kg. The lowest decline in the export price of virgin coconut oil occurred in 2019 with a difference of -35% from the previous year, while the highest price increase was in 2011 with a difference of 66% increase from 2010. **Figure 4** describes the development export prices of crude coconut oil and virgin coconut oil in Indonesia.

If we compare the average price of Indonesia's exports with other coconut oil-producing and exporting countries, the average export price of Indonesian crude coconut oil is 1.08 USD/Kg, higher than Malaysia's 1.05 USD/Kg. however, the average value of the export price of Indonesian crude coconut oil is lower than Sri Lanka's 8.79 USD/Kg, the Philippines 1.38 USD/Kg and the Netherlands' 1.33 USD/Kg. If we compare the average price of the five producers and exporters of crude coconut oil, Sri Lanka has the highest average price, followed by the Philippines, Netherlands, Indonesia and Malaysia. The average export price of virgin coconut oil in 2010-2020, Indonesia is 1.18 USD/kg, the average export price of Indonesian virgin coconut oil is lower when compared to other producing and exporting countries. The first rank with the highest average price of virgin coconut oil is Sri Lanka with a price of 3.08 USD/Kg, followed by the Netherlands 1.45 USD/Kg, Philippines 1.39 USD/Kg and Malaysia with an average export price of 1.29 USD/Kg. in detail is described in **Figure 5**.

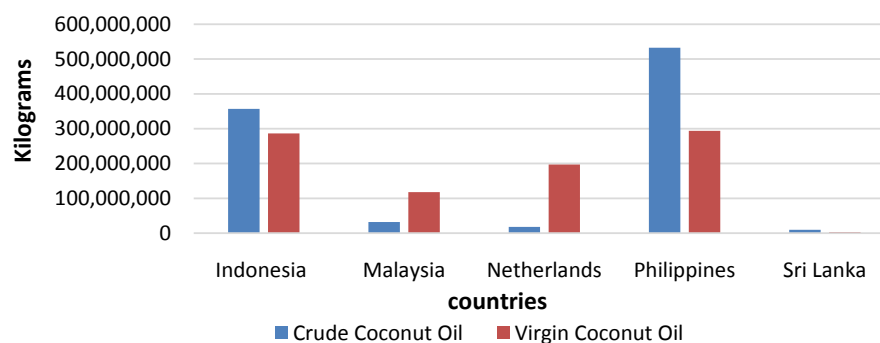


Figure 3. Comparison of average exports of Indonesian crude coconut oil and Indonesian virgin coconut oil with other producing and exporting countries (2010-2020).

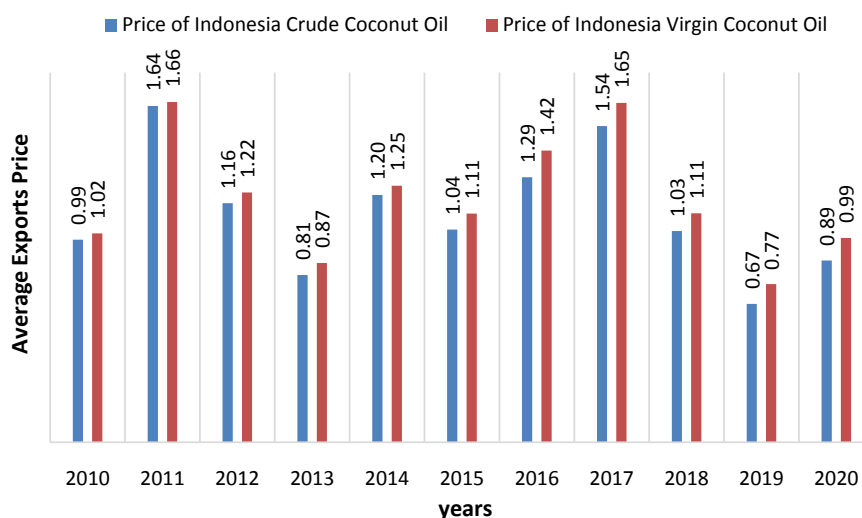


Figure 4. The development of the average exports price of Indonesian crude coconut oil and Indonesian virgin coconut oil in 2010-2020 (USD).

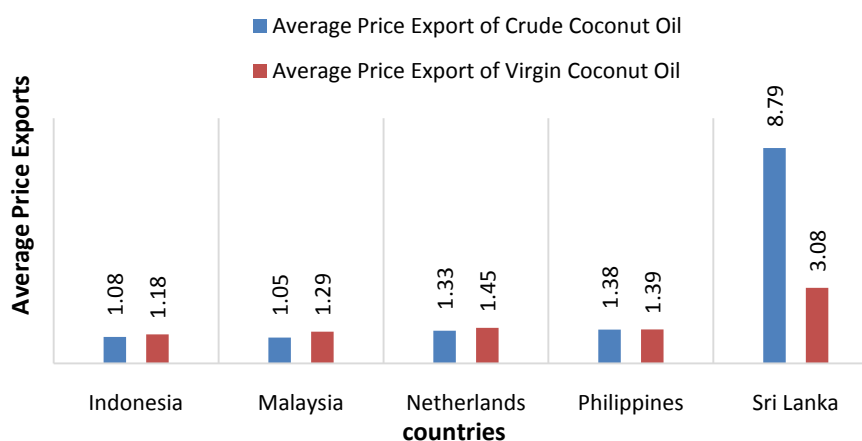


Figure 5. Comparison of average price exports of Indonesian crude coconut oil and Indonesian virgin coconut oil with other producing and exporting countries (2010-2020).

3. Literature Review

This study discusses the specialization of trade and the competitiveness of Indonesian coconut oil in the international market. Here's the domestic research on specialization of trade or competitiveness of certain commodities. Putri Daulika in 2020, conducted research on competitive analysis and factors affecting natural rubber export price in Indonesia, in this study researchers used Revealed Comparative Advantage (RCA), Trade Specialization Index Approach (TSI) and multiple regression to analyze natural rubber in Indonesia, The results of the study on the competitiveness of Indonesian natural rubber from 1995-2017 showed an average value of more than 1 ($RCA > 1$), and a Trade Specialization Index of 0.98 or more than 1 ($TSI > 1$) so that the competitiveness of Indonesia's natural rubber exports entered into the maturation stage, and the factors that affect the export price of Indonesian natural rubber are the exchange rate, international

rubber price, domestic consumption and international rubber price (Daulika, Peng, & Hanani, 2020). The same as the previous researcher Puspi Eko Wiranthi in 2017 carried out an analysis of competitiveness and Factors Affecting Export of the Indonesia Canned Pineapple in the World and the Destination Countries, research using several methods, Revealed Competitive Advantage (RCA) shows the results of Indonesia canned pineapple has a comparative advantage in Indonesia's export destination countries, Export Product Dynamics (EPD) shows that Indonesia is in a rising star position for the international market and export destination countries, the factors affecting exports are pineapple export price, real GDP, and population of destination countries (Wiranthi & Mubarok, 2017), and the last researcher, Esti Sri Luhur, in 2019, analyzing the competitiveness of Indonesian fishery in the ASEAN and Canadian markets, researchers used Revealed Comparative Advantage (RCA) Methods, Export Product Dynamic (EPD), and X-Model product export potential in their research. The results of this study that Indonesia faces high competition with Vietnam and Canada in the international market, Indonesian fishery products show strong competitiveness in the international market except for the Philippines and Canada. The market position of Indonesian fishery products is in a rising star position and a lost opportunity for the Philippines, Canada and Thailand markets (Luhur, Mulatsih, & Puspitawati, 2019).

The following is foreign research on specialization of trade or competitiveness of certain commodities. Shi Zhe Feng in 2017 conducted a study on a comparative analysis on the export competitiveness between Korea and China, the research was conducted in 2011-2015, the results of this research RCA from Korea China has strong competitiveness with an RCA value > 1 , and TSI shows positive results and tends to become an export country. The same results are shown in exports from China to Korea, the RCA value is more than 1 and the TSI shows a positive result which means specialization in export (Shen, Kim, & Gu, 2017). Furthermore, a research conducted by Sevcan in 2017, conducted a study entitled Static and Dynamic Revealed Comparative Advantage: A Comparative Analysis of Turkey and Russia, calculating the RCA of 14 general sectors, and the results of Turkey's research have a comparative advantage of 6 sectors, while Russia has a comparative advantage of 11 sectors (Güneş & Tan, 2017).

The current study fills the analytical gap by providing analysis using the Revealed Competitive Advantage and Trade Specialization Index models. Indonesia coconut oil has received less attention from researchers, many researchers focus on Indonesia's main export commodities such as crude palm oil and natural rubber. This paper focuses on trade specialization and competitiveness of Indonesian coconut oil to fill the literature that will be useful for governments or countries that will formulate policies, academics, and researchers.

4. Methodology and Data

This study aims to analyze trade specialization and competitiveness of Indone-

sian coconut oil in the international market. In this study, the coconut oil studied was crude coconut oil with HS code 151311 and virgin coconut oil with HS code 151319 by using this type of quantitative research, quantitative is research which is generally analyzed using descriptive statistics that produce data in the form of numbers (Silaen, 2018). When researchers use quantitative methods to develop their knowledge, they generally use a post-positivist approach, using experiments and surveys for investigative strategies and to generate statistical data by collecting data on a predetermined instrument (Creswell, 2003). The data used in this study is secondary data, Existing data sets were accessed on United Nations Commodity Trade (UN COMTRADE), which is a repository of official international trade statistics provided by The United National Statistics Division (UNSD), users can obtain annual international trade statistics, detailed by commodity category and partner country. In this study the data obtained from UN COMTRADE are export value crude coconut oil and virgin coconut oil from five largest producing and exporting countries, import value crude coconut oil and virgin coconut oil from five largest producing and exporting countries, total export value from country five largest producing and exporting countries, the world export value of crude coconut oil and virgin coconut oil, and the world export value, all data were taken during the period 2010-2020.

The data analysis method used in this study is the Trade Specialization Index (TSI) and Revealed Comparative Advantage (RCA), TSI for measuring trade specialization Indonesian crude coconut oil and virgin coconut oil in the international market, in addition to measuring trade specialization, TSI can be used to determine Indonesia's position as an exporting or importing country for crude coconut oil and Indonesian virgin coconut oil commodities. RCA is used to determine the comparative advantage or competitiveness of the export commodities of Indonesian crude coconut oil and Indonesian virgin coconut oil in the international market.

4.1. Trade Specialization Index

The Trade Specialization Index (TSI) is used to analyze the position and stages of development of a product, the results from this TSI can also describe a commodity produced by a country whether it makes the country tend to be an exporter or importer country, the TSI is formulated as follows (Ministry of Trade, 2008):

$$TSI = \frac{(X_{ia} - M_{ia})}{(X_{ia} + M_{ia})} \quad (1)$$

Description:

TSI: Trade specialization index

X_{ia} : Export Value Crude coconut oil and virgin coconut oil from country i (USD)

M_{ia} : Import Value Crude coconut oil and virgin coconut oil from country i (USD)

The criteria for determining whether a country is an exporting country or an importing country are as follows (Ningrum, 2013b):

1) If the value is positive, above 0 to 1, then the country tends to be an exporting country for crude coconut oil and virgin coconut oil.

2) If the value is negative, below 0 to -1, then the country tends to be an importing country for crude coconut oil and virgin coconut oil.

The TSI index can also be used to measure the growth rate of crude coconut oil and virgin coconut oil in international trade which is divided into the following five stages:

1) Introduction Stage

TSI index value -1.00 to -0.50, at this stage an industry (forerunner) from a new country (A) exports its new products to the importing country.

2) Import Substitution Stage

TSI index value -0.051 to 0.00, at this stage, a country (B) imports more certain commodities than exports, because of low domestic productivity which is smaller than domestic demand.

3) Growth Stage

The TSI index value is in the range of 0.01 to 0.80, at this stage a country (B) begins to increase its export production, so that the supply for that commodity is greater than the demand for A in the domestic market.

4) Maturity Stage

The index value is in the range of 0.81 to 1.00, at this stage, country (B) can already be called a net exporter.

5) Steps back to Import

TSI index value again decreased in the range 1.00 to 0.00, at this stage, the commodity produced by a country (B) is unable to compete in the domestic market with the same commodity from country (A), domestic production is even less than domestic demand.

4.2. Revealed Comparative Advantage (RCA)

Revealed Comparative Advantage (RCA) is used to measure the comparative competitiveness of a country's commodities with other producing and exporting countries. According to the Indonesian Ministry of Trade, RCA is a method used to measure the comparative advantage of regions, provinces and countries, by calculating the share of the export value of a commodity to the total exports of that commodity compared to the share of the value of the product in world trade, or formulated as follows (Tambunan, 2004):

$$RCA = \frac{X_{oi}/X_{ti}}{X_{woi}/X_{wt}} \quad (2)$$

Description:

RCA: Revealed Comparative Advantage

X_{oi} : Export Value of crude coconut oil and virgin coconut oil from country i

(USD)

X_{it} : Total export value from country i (USD)

X_{woi} : The world export value of crude coconut oil and virgin coconut oil (USD)

X_{wt} : Total world export value (USD)

5. Results and Discussion

5.1. The Results of the Analysis Trade Specialization Index (TSI)

5.1.1. The Results of the Analysis of the Crude Coconut Oil Trade Specialization Index

The average TSI value for Indonesian crude coconut oil from 2010-2020 is 0.94. The average TSI value for Indonesian crude coconut oil when compared to the three other producing and exporting countries is higher but is the same as the Philippines at 0.94. Meanwhile, Sri Lanka has an average TSI score of 0.83, followed by Malaysia with an average TSI score of -0.67 , and the last position is the Netherlands with an average TSI score of -0.89 . **Table 2** describes the trade specialization index to five producing and exporting countries.

Indonesia and the Philippines are ranked one of the highest TSI values among other producers, this is because the average value of Indonesian and Philippines crude coconut oil exports is greater than imports of crude coconut oil or in other words the trade balance of crude coconut oil commodities is surplus, the average trade balance of Indonesian crude coconut oil in 2010-2020 was a surplus of 387,043,794 USD and the Philippines had an average trade balance of crude coconut oil surplus of 688,762,911 USD, Sri Lanka had a surplus of 81,263,801 USD.

Table 2. Trade specialization index of the five producing and exporting countries of crude coconut oil in international markets 2010-2020.

Years	Indonesia	Malaysia	Netherlands	Philippines	Sri Lanka
2010	1.00	-0.80	-0.75	1.00	0.66
2011	1.00	-0.63	-0.82	1.00	0.60
2012	1.00	-0.67	-0.92	1.00	0.78
2013	0.99	-0.84	-0.94	1.00	0.98
2014	1.00	-0.64	-0.93	1.00	0.99
2015	1.00	-0.74	-0.90	1.00	0.91
2016	0.95	-0.78	-0.90	1.00	0.99
2017	0.93	-0.64	-0.89	0.36	0.94
2018	0.91	-0.68	-0.94	1.00	1.00
2019	0.81	-0.34	-0.91	1.00	0.94
2020	0.72	-0.64	-0.83	1.00	0.29
Average	0.94	-0.67	-0.89	0.94	0.83

Source: Authors Research.

Meanwhile, Malaysia and the Netherlands have a deficit in the trade balance of crude coconut oil, because the average value of their imports is greater than the average value of exports of crude coconut oil, Malaysia has a deficit of -132,828,060 USD while the Netherlands has a deficit of -373,626,670 USD, Based on this, it can be concluded that the negative trade balance for the commodity of crude coconut oil, Malaysia and the Netherlands is one of the causes of the two countries having a negative TSI.

The TSI is also used to measure the growth rate of a commodity which is divided into five stages, five producing and exporting countries of crude coconut oil that can enter the maturity stage or have a TSI value score between 0.81 to 1.00, Indonesia with a TSI value of 0.94, Philippines with a TSI value of 0.94 and Sri Lanka with a TSI value of 0.83. This maturity stage means that the three countries are net exporters of crude coconut oil that have strong competitiveness in the international market. Furthermore, Malaysia and the Netherlands, these two countries enter the import substitution stage because they have a TSI value between -0.51 to 0.00, Malaysia has a TSI value of -0.67 and the Netherlands has a TSI value of -0.89. This Import Substitution Stage means that Malaysia and Netherlands crude coconut oil has very low competitiveness, the export value is lower than the import value. So that Malaysia and the Netherlands import crude coconut oil more than they export.

5.1.2. The Results of the Analysis of the Virgin Coconut Oil Trade Specialization Index

The five producer and exporting countries of virgin coconut oil in 2010-2020 had a positive TSI value between 0.00 - 1.00, the average TSI value of Indonesian virgin coconut oil from 2010-2020 was 0.99 making Indonesia in second position with the highest TSI value after the Philippines with an average TSI value of virgin coconut oil of 1.00, in third position the Netherlands with an average TSI value of 0.89, in fourth position Malaysia with an average TSI value of 0.61 and in lastly Sri Lanka with an average TSI value of 0.29. **Table 3** will describe the TSI of the five producing and exporting countries of virgin coconut oil from 2010-2020.

The average value of Indonesia's TSI is below the Philippines but still has a trade balance surplus of Virgin coconut oil of 337,238,974 USD, with an average TSI value of 0.99, the Philippines as the country with the highest TSI value experienced a trade balance surplus of virgin coconut oil of 406,567,496 USD, with TSI value of 1.00, Netherland was in third position with an average TSI value of 0.89 and experienced a trade balance surplus of virgin coconut oil of 267,946,246 USD. Looking at the TSI values of the three countries, Indonesia, the Philippines and the Netherlands, which are around 0.81 to 1.00, it indicates that these three producing countries are entering the maturity stage, which means that these three countries have strong competitiveness in the international market and are net exporters of virgin coconut oil. In the fourth and fifth positions, namely Malaysia and Sri Lanka, Malaysia has an average TSI value of 0.61 and has a trade

Table 3. Trade specialization index of the five producing and exporting countries of virgin coconut oil in international markets 2010-2020.

Years	Indonesia	Malaysia	Netherlands	Philippines	Sri Lanka
2010	1.00	0.45	0.78	1.00	-0.41
2011	1.00	0.42	0.81	1.00	-0.58
2012	0.99	0.49	0.95	1.00	0.04
2013	0.99	0.79	0.98	1.00	0.12
2014	1.00	0.57	0.98	0.99	0.78
2015	1.00	0.60	0.94	0.99	0.87
2016	1.00	0.62	0.90	1.00	0.83
2017	0.99	0.41	0.87	1.00	0.57
2018	0.99	0.64	0.88	1.00	1.00
2019	0.96	0.88	0.84	1.00	0.56
2020	0.98	0.81	0.84	0.99	-0.61
Average	0.99	0.61	0.89	1.00	0.29

Source: Authors Research.

balance surplus of virgin coconut oil of 112,060,321 USD. Lastly, Sri Lanka has an average TSI value of 0.29 with a trade balance surplus of virgin coconut oil of 2,274,453 USD. The average value of TSI Malaysia and Sri Lanka which is at 0.01 to 0.80 makes these two countries enter the growth stage, the growth stage means Malaysia and Sri Lanka are in the stage of increasing exports in the international market and in the domestic market supply virgin coconut oil is greater than the demand.

5.2. The Results of the Revealed Comparative Advantage (RCA)

5.2.1. The Results of the Revealed Comparative Advantage (RCA) Analysis of Indonesian Crude Coconut Oil

The RCA value in **Table 4**, shows the competitiveness of Indonesia's Crude coconut oil compared to other Crude coconut oil producing countries, the results of the average RCA index value of crude coconut oil of the five largest exporting countries in the world show that of the five countries only one does not have a comparative advantage because have an average RCA value below 1, namely the Netherlands, while other countries Indonesia, Malaysia, Philippines, Sri Lanka have a comparative advantage with an average RCA value above 1.

Based on **Table 4**, the average value of the RCA index of Indonesian Crude coconut oil is 30.67. This makes Indonesia in the third position after the Philippines with an average RCA index value of 166.36 which puts the Philippines in the first position and has the strongest comparative advantage and competitiveness compared to other producing countries and Sri Lanka in the second position with an average RCA index value of 62.71, below Indonesia, there is Malaysia with an average RCA index value of 2.15 and the Netherlands with an average

Table 4. RCA index of five crude coconut oil producing and exporting countries 2010-2020 in the international market.

Years	Indonesia	Malaysia	Netherlands	Philippines	Sri Lanka
2010	23.46	0.89	0.94	196.95	8.31
2011	26.65	1.90	0.83	204.64	6.54
2012	43.27	2.06	0.46	159.18	12.06
2013	33.68	0.90	0.41	196.00	25.26
2014	39.40	1.98	0.31	160.65	56.06
2015	35.88	1.65	0.50	140.25	108.42
2016	30.92	1.31	0.54	154.78	83.28
2017	23.87	1.64	0.68	153.66	79.31
2018	33.53	2.21	0.37	162.50	105.36
2019	21.36	5.82	0.44	156.21	85.40
2020	25.30	3.28	0.80	145.15	119.78
Average	30.67	2.15	0.57	166.36	62.71

Source: Authors Research.

RCA index value of 0.57. During 2010-2020, the Philippines consistently has the highest RCA value every year among the five other crude coconut oil producing countries, this can be due to the fact that the Philippines has the highest export market share compared to other countries, as follows: oil in the total exports of five producing countries. **Table 5**, the export market share of crude coconut oil from the five largest producing and exporting countries in the international market in 2010-2020.

This export market share is obtained from the comparison of the average export value of commodity *i* (Crude Coconut Oil) of a country with the average value of a country's total exports (Ningrum, 2013a). If we look at the average value of Indonesian crude coconut oil exports, it has a high value compared to Sri Lanka, but the results of the average RCA value for Indonesia are lower than Sri Lanka. This is in accordance with the statement from Azizon (2013) which says that a high RCA value cannot indicate a high export value in nominal terms as well (Ningrum, 2013a).

The Philippines has the strongest competitiveness compared to Indonesia with an average RCA Crude coconut oil value of 135.69. This high difference was due to the higher average value of Philippines crude coconut oil exports by 733,199,797 USD and the export market share of 1229%. Compared to Indonesia, the average export value of crude coconut oil was 395,940,470 USD and the contribution of crude coconut oil export value to total exports was 0.231%. Sri Lanka occupies the second position and has the strongest competitiveness, with an average RCA difference of 32.64 with Indonesia. Sri Lanka's second highest market share is 0.463, this shows that high market share affects the value of

Table 5. Market share of crude coconut oil exports from the five largest producing and exporting countries in the international market (2010-2020).

Countries	Average Export Value of Crude Coconut Oil (USD)	Average Total Export Value (USD)	Export Share of Crude Coconut Oil (%)
Indonesia	395,940,470	171,342,377,134	0.231
Malaysia	33,803,762	222,034,064,882	0.015
Netherlands	23,792,275	540,191,516,070	0.004
Philippines	733,199,797	59,637,239,978	1.229
Sri Lanka	48,873,920	10,563,014,213	0.463

Source: UN Comtrade (Processed).

RCA. The higher the market share of crude coconut oil in total exports, the higher the RCA value. Under Indonesia, there are Malaysia and the Netherlands, with market shares of 0.015 and 0.004, respectively, Malaysia is in fourth position after Indonesia with an average export value of Crude coconut oil of 33,803,762 USD and a difference of -28.52 with an average value of Indonesia's RCA index average, in the last position is the Netherlands with an average export value of crude coconut oil of 23,792.275 USD and a difference of -30.1 with Indonesia.

5.2.2. The Results of the Revealed Comparative Advantage (RCA) Analysis of Indonesian Virgin Coconut Oil

The average RCA value of virgin coconut oil from the five largest producing and exporting countries in the world is shown in **Table 6**, showing that the five countries have an average score of more than one means that the five countries have a strong comparative advantage and competitiveness in the virgin coconut oil commodity.

Based on **Table 6**, Indonesia is in second position which has an average RCA index value of 27.07, in first place is the Philippines with an average RCA index value of 93.59, below Indonesia there is Sri Lanka in third position with an average index value. The RCA is 11.53, in fourth place is Malaysia with an average RCA index value of 9.33 and the last is the Netherlands with an average RCA index value of 7.25.

The Philippines was able to rank number one in both Virgin coconut oil and crude coconut oil in 2010-2020, while Indonesia has a better comparative competitiveness position in virgin coconut oil, which is in the second position of the five largest producing and exporting countries in the international market. The following is the market share of Indonesia and other producing countries exporting virgin coconut oil in the total exports of each producer or exporting country (**Table 7**).

The Philippines is ranked number one in the export market share of virgin coconut oil in total exports with a value of 0.683%, and is the highest exporting country in the international market with an average value from 2010-2020 of

Table 6. RCA index of five virgin coconut oil producer and exporting countries 2010-2020 in the international market.

Years	Indonesia	Malaysia	Netherlands	Philippines	Sri Lanka
2010	13.72	6.58	3.60	57.73	0.78
2011	20.42	9.83	5.78	98.44	1.34
2012	20.84	8.17	6.59	92.02	1.67
2013	22.56	10.20	8.92	149.19	8.08
2014	30.26	11.24	5.91	122.30	11.16
2015	29.21	9.18	6.97	90.03	30.81
2016	33.61	8.84	8.16	77.46	18.53
2017	30.30	7.91	9.09	93.69	10.78
2018	34.79	8.86	9.84	103.64	13.71
2019	28.96	9.39	7.26	78.22	11.30
2020	33.13	12.44	7.65	66.75	18.67
Average	27.07	9.33	7.25	93.59	11.53

Source: Authors Research.

Table 7. Market share of virgin coconut oil exports from the five largest producing and exporting countries in the international market (2010-2020).

Countries	Average Export Value of Virgin Coconut Oil (US\$)	Average Total Export Value (US\$)	Export Share of Virgin Coconut Oil (%)
Indonesia	338,581,513	171,342,377,134	0.198
Malaysia	152,455,225	222,034,064,882	0.069
Netherlands	285,007,194	540,191,516,070	0.053
Philippines	407,229,146	59,637,239,978	0.683
Sri Lanka	9,104,715	10,563,014,213	0.086

Source: UN Comtrade (Processed).

407,229,146 USD The difference between the average RCA index value of 66.52 with Indonesia. Meanwhile, Indonesia is in the second position with a market share of virgin coconut oil exports in total exports of 0.198% and an average export value of virgin coconut oil of 338,581,513 USD.

Below Indonesia, there is Sri Lanka with a market share of virgin coconut oil exports in total exports with a value of 0.086% with an average export value of virgin coconut oil of 9,104,715 USD, the difference in the average value of Sri Lanka's RCA with Indonesia is -15.54, in the fourth position, namely Malaysia with a market share of virgin coconut oil exports in total exports with a value of 0.069%, the average value of Malaysian virgin coconut oil exports of 152,455,225 USD, the difference between the average RCA value of Malaysia and Indonesia is -17.74. And finally, the Netherlands, the export market share of virgin coconut

oil in total exports is 0.053% with an average export value of virgin coconut oil of 285.007.194 USD, as explained previously, although the average export value of virgin coconut oil in the Netherlands is higher in the Netherlands. Compared to Malaysia, it does not affect the RCA value of the Netherlands. Because a high RCA value cannot be shown by a high commodity export value as well.

6. Conclusion and Recommendation

This study analyzes the Trade Specialization and Competitiveness of Indonesian Coconut Oil in the International Market, with a focus on processed coconut products in the form of Indonesian crude coconut oil with HS code 151311 and Indonesian virgin coconut oil with HS code 151319. This study uses two data analysis methods, namely Trade Specialization Index (TSI), Revealed Comparative Advantage (RCA). Based on the results of the trade specialization index of crude coconut oil and virgin coconut oil, it shows that Indonesia is entering the maturity stage or has a TSI score from 0.81 to 1.0. For Indonesian crude coconut oil, it has an average TSI score of 0.94 and Indonesian virgin coconut oil has an average TSI score of 0.99, making Indonesia an exporting country for crude coconut oil and virgin coconut oil in the international market. And the RCA results from this study show that Indonesian crude coconut oil has a strong comparative advantage and competitiveness with an average value of $RCA > 1$, crude coconut oil has an average RCA value of 30.67 and is in the third position after the Philippines with the average RCA value of 166.36 and Sri Lanka with an average RCA value of 62.71. While the RCA results from Indonesian virgin coconut oil are in the second position with an average RCA value of 27.07, and the Philippines is in the first position with an average RCA value of 93.59.

However, what needs to be considered is the area of coconut plantations in Indonesia which continues to decline every year, from 2011 to 2020 a decrease of 10% from 3767.7 thousand hectares to 3396.8 thousand hectares. The decline in plantation land area will greatly affect the production of processed products coconut and will have an impact on the export value and competitiveness of processed coconut products such as crude coconut oil and virgin coconut oil in the international market. The researcher hopes that this problem will be a concern for the Indonesian government or related agencies to make policies that can protect and preserve coconut plantations because plantation areas are an important factor to increase exports and have an impact on increasing state income.

Limitation of the Research

Indonesian coconut oil exported to the international market has several types with different HS Codes. Therefore, we have narrowed this research and focused on two main points, namely:

First, this research is limited to crude coconut oil (HS Code 151311) and virgin coconut oil (HS Code 151319).

Second, the coconut oil trading period from 2010 to 2020.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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