APPROVAL PAGE

PUBLICATION MANUSCRIPT

COMPARATIVE ADVANTAGES OF INDONESIAN AGRICULTURAL EXPORT COMMODITIES IN ASEAN MARKET 2007-2016

Compiled by:

Yudani Alamsyah Harahap 20150220148

This manuscript has been accepted at the date of July 24th, 2019

Supervisor I,

Heri Akhmadi, S.P., M.A NIK. 19820126 201602 133 064

Yogyakarta, July 24th, 2019

Supervisor II,

Dr. Aris Slamet Widodo, S.P., M.Sc. NIK. 19770125 200104133 056

Has been approved by:



COMPARATIVE ADVANTAGES OF INDONESIAN AGRICULTURAL EXPORT COMMODITIES IN ASEAN MARKET 2007-2016

Yudani Alamsyah Harahap / 20150220148 Heri Akhmadi, S.P., M.A / Dr. Aris Slamet Widodo, S.P., M.Sc. Department of Agribusiness Faculty of Agriculture Universitas Muhammadiyah Yogyakarta

INTRODUCTION

Indonesia is the largest country in term of land and agriculture in ASEAN (ASEAN, 2017). The total of agricultural areas in Indonesia are reached up to 57 million hectares in 2014. While Indonesia has the largest agricultural area, the percentage of agricultural area to land area is not as big as the percentage of the Philippines, Thailand and Vietnam. Therefore, Indonesia should expand in agricultural sector to get more productivity of the land.

Improving Indonesia's comparativeness is about being different. It means deliberately choosing a different set of activities to deliver a unique mix of value. Indonesia has a wide array of potential clusters, especially in natural resources-related fields. Indonesia would face a simple imperative- win the race to discover and preempt it. The essence of comparativeness is to choose activities that are different from another country, especially in this case the comparative in ASEAN (Porter, 2009).

Under the ASEAN Free Trade Area, all members of ASEAN are free trade started by 2015. It's meant that no charge barriers on cross border transaction between countries in ASEAN. The Indonesian membership on AFTA is expected to boost trade among parties due to decreasing trading cost and removing trade barrier. This policy ultimately could enhance market size and increase the competitiveness of countries product, which is in the end could increase economic growth and welfare (Akhmadi, 2017). There are several main agricultural products and inputs that have a large amount of export and import value in ASEAN. These commodities are rice, banana, pineapple, mango, palm oil, coconut oil, cake of coconut, soybean, sugar and honey, coffee, and tobacco and rubber.

METHODOLOGY

The analysis method used in this study was a descriptive analysis. The trade data covering the period between 2007-2016 was gathered from the ten annual data ASEAN Statistical Yearbook period 2007 until 2016. In the data, there are 12 commodities from 2007-2016. The ASEAN Selected Agricultural Commodities for the 2007-2016 showed in Table 1.

Table 1. The ASEAN Selected Agricultural Commodities and the HS Code

No	Products and input	HS code
1	Rice, Including Husked and Broken Rice	10.06
2	Banana Fresh	08.03
3	Pineapple Production Excluding Fresh	08.04.30
4	Mangoes Pineapple Fresh, Including Guava, Mangosteen, Etc	08.05
5	Palm oil	15.11
6	Coconut Oil	15.13
7	Cake of Coconuts	19.05
8	Soybeans	12.01
9	Sugar and Honey	17.01/17.02
10	Coffee, Green, Husk, Roasted	09.01
11	Tobacco	24.01
12	Crude Rubber	40.01

The performance of major agricultural commodities in the last decade has been quite good in some commodities. The Indonesian agricultural export commodities, however, remains facing various challenges, most of them are very structural in nature, such as low-yielding smallholder crop systems, sustainability pressures, low-quality of production, underinvestment, inadequate infrastructure, underdeveloped agricultural practices and restrictive government policies. Indonesian Agricultural Export Commodities to ASEAN shown in Table 8.

Table 2. Indonesian Agricultural Export Commodities to ASEAN 2007-2016 (in million US)

No	No Products and input	Years									
NO		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Rice	0.5	0.86	1.81	0.45	0.84	1.19	1.2	0.8	1	1
2	Fresh Banana	0.9	0.99	0.2	0,05	1.01	0.87	3	16.2	13	11
3	Pineapple	71.3	204.4	138.8	114.8	169.4	176	134	165	192	152
4	Mangoes, Etc	6.8	7.86	8.03	10.08	12.38	19.9	7.7	8.6	20	23
5	Palm oil	7869	12375	10367	13469	17261	17602	15838	17464	15385	14367
6	Coconut Oil	570	769.1	387.3	566.1	937.8	947	572	943	812	816
7	Cake of Coconuts	36.4	34.41	24.77	25.49	33.66	61.4	46.7	61	46	39
8	Soybeans	2.3	1.41	0,34	0.34	0.44	1.59	0.5	24.4	1	0
9	Sugar and Honey	93.9	150.9	166.0	176.2	194.7	206	235	284	219	225
10	Coffee	636	990.8	823.9	814.3	1036	1249	1173	1039	1198	1008
11	Tobacco	424.7	508.8	595	672.6	710	793	914	999	958	947
12	Crude Rubber	4870	6058	3243	7329	11766	7864	6910	4744	3701	3373

The theory of data processing is to use Revealed Comparative Advantage (RCA) theory. Processed data is the export data of Indonesian countries and all countries in ASEAN. (Bella Balassa, 1965) derived an index that measures a country's revealed comparative advantage in the trade of a particular product or industry by calculating the share of that product/industry in the country's total exports relative to the

product/industry's share in total world export. The RCA concept that was promoted by Balassa is calculated as:

$$(xij/xin)$$

$$RCAij = -----(1)$$

In equation (1), x_{ij} the total export of country *i* for the product classification, x_{in} the total value of export from country *i*, minus the total export of product. Meanwhile, x_{rj} is the total export from the rest of the world (world) for the product *j* minus the value of export with similar from country *i*. Next, *n* is the total export of the world minus the total export value of country *i*.

The calculation of RCA will be interpreted on the classifications of RCA value. There are 4 classes of interpretation included class A, class B, class C, and class D (Hinloopen & Marrewijk, 2001). These classifications are shown in Table 3.

 Table 3. The Classification of RCA Index Values

Class A	$0 < Balassa Index \le 1$	Revealed Comparative	
		Disadvantage	
Class B	$1 < Balassa Index \le 2$	Weak Comparative Advantage	
Class C	$2 < Balassa Index \leq 4$	Medium Comparative Advantage	
Class D	4 < Balassa Index	Strong Comparative Advantage	

As shown in Table 3. Class A includes all the products or industries/sectors for which a country does not have a revealed comparative advantage; the other three classes (B, C, D) approximately divide the products or industries/sectors related to the

revealed comparative advantage into three levels: weak comparative advantage-Class B, medium comparative advantage -Class C and strong comparative advantage-Class D.

RESULT AND ANALYSIS

1. Revealed Comparative Advantage of Rice (HS.10.06)

Rice is staple food for more than 80% of the people and also major source of income for majority of the grass-root farmers; therefore, paddy is the most important food crop grown in Indonesia. The Revealed Comparative Advantage (RCA) value of rice, including husked and broken rice (HS. 10.06) are shown in Figure 1.



Figure 1. RCA Value of Rice

The Figure 1 showed that the competitiveness of rice, including husked and broken rice in Indonesia is quite low. The average of RCA of this product is 0.000238074 which is in Balassa index called as Revealed Comparative Disadvantage. This is due to the rice production in Indonesia is mostly consumed by domestic demand. That way, Indonesia is including the largest rice consuming country in southeast Asia. According to data (KEMENPAN, 2012), Indonesians consumed rice up to 107.71 kg per capita per year. The value is almost double that of world rice consumption, which is only 60 kg per capita per year. Meanwhile, in other countries the rice consumption such as in Korea reached up 40 kg per capita per year, Japan 50 kg per year, Malaysia 80 kg per year, and Thailand 70 kg per year.

2. Revealed Comparative Advantage of Fresh Banana (HS. 08.03)

Banana is a horticultural crop that has a high level of production in Indonesia because of the suitability of land, climate, and the support of human resources. Bananas are known as tolerant of various heights, from areas with lowland as well as with highaltitude areas. The Revealed Comparative Advantage (RCA) value of Fresh Banana (HS. 08.03) are shown in Figure 2.



Figure 2 . RCA Value of Fresh Banana

The Figure 2 showed that the average of RCA of this product is 0.000116978 which is in Balassa index called Revealed Comparative Disadvantage. Banana already showed the increase since 2013 to 2014, but it is going down slowly in 2015 and 2016. The Philippines is the number one banana producing country in ASEAN (KEMENTAN, 2016a). According to the FAO data of 2008-2012, the average production of bananas from the Philippines reached 9.04 million tons with the contribution in ASEAN countries by 47.90%. Some factors that influence the

comparative advantages of Indonesian bananas include: (1) natural resources, (2) biological factors, (3) input prices, (4) technology and (5) transportation.

3. Revealed Comparative Advantage of Pineapple Excluding Fresh (HS. 08.04.30)

Nearly 70% of the pineapple is consumed as fresh fruit in producing countries. Its origin has been traced to Brazil and Paraguay in the Amazon Basin where the fruit was domesticated. The Revealed Comparative Advantage (RCA) value of Pineapple Production Excluding Fresh (08.04.30.00) are shown in Figure 3.



Figure 3 RCA Value of Pineapple Production Excluding Fresh

The Figure 3 showed that the competitiveness of pineapple in ASEAN market still far away from the good index to be a major exporter. The highest RCA point showed in 2008 and then going down slowly and get increased in 2015 and back to down in 2016. The average of RCA of this product is 0.004036737 which is in Balassa index called as Revealed Comparative Disadvantage. Marketing of overseas pineapple is faced with some problems such as the product cannot as good as the quality standards of the world market, continuity and the amount of supply is not guaranteed (KEMENTAN, 2016b). Philippines dominates as the largest exporter country of South

East Asia, even the year 2009-2013 fresh export of pineapple from the Philippines accounted for more than 93% of the volume of export of pineapple from ASEAN countries (KEMENTAN, 2016b).

4. Revealed Comparative Advantage of Mangoes, Guava, and Mangosteen (HS. 08.05)

In fact, Indonesians consume fewer fruits and vegetables than another country such as Cambodia (Kundhavi Kadiresan, 2017). The Revealed Comparative Advantage (RCA) value of Mangoes, Guava, and Mangosteen, (HS. 08.05) are shown in Figure 4.



Figure 4 RCA of Mangoes, Guava, and Mangosteen

The Figure 4 showed that the competitiveness of mangoes, guava, and mangosteen in Indonesia is quite low. However, from the bar we found that RCA index is not stabilized. The average of RCA of this product is 0.077013989 which is in Balassa index called Revealed Comparative Disadvantage. The competitiveness of mango industry in Indonesia is quite low, mostly because mango production fluctuates depending on the seasonal patterns of production. Domestic demand for mango has increased significantly as many societal efforts to promote local fruits in recent years.

5. Revealed Comparative Advantage of Palm Oil (HS. 15.11)

From 1997–2017, Indonesian palm oil production increased from five to over forty million metric tons (Thom Wright, 2017). More than 85% is exported and palm has been Indonesia's largest agricultural export for the last two decades, accounting for more than 55 per cent of the 65 million metric tons produced globally in 2017. The Revealed Comparative Advantage (RCA) value of Palm Oil (15.11) are shown in Figure 5.



Figure 5. RCA Value of Palm Oil

The figure showed that the competitiveness of Palm Oil in ASEAN market is in the good index to be a major exporter. The average of RCA in this product is 5.250077458 which is in Balassa index called Strong Comparative Advantage. The highest RCA point showed in 2016 with value was more than 7. The Palm oil was among the leading exporting commodities for the whole period in terms of competitiveness and export share. The export markets for these products are not only in ASEAN (Malaysia, Myanmar, Singapura, Filipina, Vietnam, Thailand), but also in Asian economies (China, Japan, Korea,), and some European countries like Austria, Belgium, Bulgaria, France, Ireland, Italy and the UK. This industry has maintained high competitiveness with its RCA index varying between 3.31 and 7.20.

6. Revealed Comparative Advantage of Coconut Oil (HS. 15.13)

Indonesia's coconut production is currently concentrated on several major islands namely Sumatra, Java, and Sulawesi with an average productivity in the year 2014 of 11.36 tons/hectare (KEMENTAN, 2014). The Revealed Comparative Advantage (RCA) value of Coconut Oil (HS. 15.13) are shown in Figure 6.



Figure 6. RCA Value of Coconut Oil

The Figure 6 showed that the competitiveness of Coconut Oil in ASEAN market is in the weak index to be a major exporter. The average of RCA in this product is 1.117319439 which is in Balassa index called Weak Comparative Advantage. The highest RCA point showed in 2012 with value 1.5. The oil production Center in the world based on FAO data in 2008-2012 is in five countries namely Indonesia, Philippines, India, Brazil, and Sri Lanka (KEMENTAN, 2014). Indonesia ranked first as a country of coconut producers in the world with an average production of 18.09 million tons of coconut grains or contributed 30.12% to world coconut production. The second order was occupied by the Philippines with a contribution of 25.85% followed

by India (17.54%), Brazil (4.95%), and Sri Lanka (3.47%). But the market share of Indonesian palm coconut in international market was the second largest after the Philippines (Sukmaya, 2017).

7. Revealed Comparative Advantage of Cake of Coconuts (HS. 19.05)

During the year 1980-1997, the average growth of coconut production rose by 3% per year whereas during 1998-2013 its growth average of 0.85% per year. In general, there is a total increase in coconut production in Indonesia from 1,666,073 tons in 1980 to 3,067,980 tons in 2013, where the highest production of coconut achieved in 2009 is 3,257,969 tons or up 0.56% for the year 2008 (KEMENTAN, 2016b). The Revealed Comparative Advantage (RCA) value of Cake of Coconut (HS.19.05) are shown in Figure 7.



Figure 7. RCA Value of Cake of Coconuts

The Figure 7 showed that the competitiveness of Cake of Coconuts in ASEAN market is mostly low and unstable. The average value of Revealed Comparative Advantage of Coconuts cake is only 0.95 which classified on class A in RCA index or in Balassa index called Revealed Comparative Disadvantage. The main producer of

copra and coconut oil is the Philippines (42% of the oil production in 2009), followed by Indonesia (25%) and India (12%). Half of the production of copra meal is sold for export and the Philippines alone exports 0.5 million tons (62.5% of its production).

8. Revealed Comparative Advantage of Soybeans (HS. 12.01)

Indonesia is the largest soybean producer in the world and the largest soy market in Asia. The results of SUSENAS conducted in 2015, showing average Tempe consumption per person per year in Indonesia amounted to 6.99 kg and know 7.51 kg. Ironically, fulfillment of the need for soy which is the main raw material of Tempe and tofu, 67.28% or as much as 1.96 million tons should be imported from abroad. This happens because domestic production is not able to adequately demand for Tempe and tofu producers in the country (Ir. Dyah Riniarsi T., 2016). The Revealed Comparative Advantage (RCA) value of Soybeans (12.01) are shown in Figure 8.



Figure 8. RCA Value of Soybeans

The Figure 8 showed that the competitiveness of Soybeans in ASEAN market is in the bad index to be a major exporter. The highest RCA point showed in 2014 with value 1.6. The average of RCA in this product is 0.224756933 which is in Balassa index called Revealed Comparative Disadvantage. One of the factors causing low production of white soy in Indonesia, is the raw material of Tempe and tofu, not the original tropical plants so that the results are always lower than in Japan and China. Breeding and domestication have not fully changed the photosensitive properties of white soybeans. On the other hand, non-photosensitive black soy is less concerned with the breeding, although in terms of adaptation is more suitable for Indonesia.

9. Revealed Comparative Advantage of Sugar and Honey (HS. 17.01/17.02)

Sugarcane plantations in Indonesia are cultivated by the people's farmers, state owned enterprises (companies) and private companies. Sugar needs in Indonesia both white and refined crystals sugar are often higher than the production of sugar in Indonesia. There is a gap or difference between production and consumption causing Indonesia to always import to meet the shortage of domestic sugar consumption. The Revealed Comparative Advantage (RCA) value of Sugar and Honey (HS. 17.01/17.02) are shown in Figure 9.



Figure 9. RCA Value of Sugar and Honey

Based on Figure 9, the value of RCA can be explained that Indonesian sugar and honey from 2007-2016 has bad competitiveness due to the value of RCA less than one in ASEAN market. The average of RCA in this product is 0.14142879 which is in Balassa index called as Revealed Comparative Disadvantage. This condition competitiveness of sugar commodities due to the inability of the national sugar industry in fulfilling the needs of domestic sugar so that the import of white sugar is relatively high. The low level of sugar factory efficiency is caused by the high cost of production and the old Sugar mill machine.

10. Revealed Comparative Advantage of Coffee (HS. 09.01)

Indonesia is the largest producer of coffee after Brazil, Vietnam, and Columbia. In other word Indonesia is the second largest Robusta coffee producer after Vietnam. Among ASEAN countries, Vietnam ranks first as the country with the largest coffee production in the ASEAN region with an average production of 1,668,396 tons or contributing 68.26% to the total coffee production in the ASEAN region. Indonesia on average produces 572,460 tons of coffee in 2011-2015. The contribution of Indonesian coffee production in the ASEAN region only reached 23.42%. The next largest coffee producing country in ASEAN is Malaysia with an average coffee production of 94,800 tons and contributing 3.88% (KEMENTAN, 2016c). The Revealed Comparative Advantage (RCA) value of Coffee, Green, Husk, and Roasted (HS. 09.01) are shown in Figure 10.



Figure 10. RCA Value of Coffee

From the Figure 10, Indonesia has weak comparative advantage since 2007 until 2011. The average of RCA in this product is 0.983540642 which is in Balassa index called Revealed Comparative Disadvantage. The highest RCA happened in 2009 which is almost 1.6 because the production in Indonesia is high. However, Coffee production in 2010 was estimated to about 658 thousand tons, a significant decline from 2009, this is because of the long rainy seasons in Indonesia. Indonesian coffee export destination in the form of fresh and processed total with the largest export volume in 2015 was the USA at 65,509 tons (13.05%). The next export destination countries that contributed significantly were Germany at 47,664 tons (9.49%), Italy 43,048 tons (8.58%), Japan 41,241 tons (8.21%), Malaysia 39,394 tons (7.85%), Thailand 29,305 tons (5.84%), and Russia 26,940 tons (5.37%) (KEMENTAN, 2016c).

11. Revealed Comparative Advantage of Tobacco (HS. 24.01)

Tobacco products have a very important position in the economy and trade of the world. Commodity tobacco is a big business in international trade. The industry plays a big role in providing employment opportunities and resources for the world's people. Not only that, tobacco and cigarette industry has made a big contribution to the revenue of the country, both developed and developing countries. The Revealed Comparative Advantage (RCA) value of Tobacco (HS. 24.01) are shown in Figure 11.



Figure 11. RCA Value of Tobacco

Based on Figure 11 the value of RCA can be explained that Indonesian Tobacco has bad competitiveness due to the value of RCA less than one in ASEAN market. The average of RCA in this product is 0.863190285 which is in Balassa index called Revealed Comparative Disadvantage. Indonesian tobacco is mostly exported to the European Union. In 2011, it reached 15,698 tons or valued at USD 85.3 million. This value increased by 52.13% compared to 2007. Meanwhile, in period of January-May 2012, tobacco exports reached 6,409 tons or worth 34.3 million, a decrease of 8% in 2011 in the same period (KEMENDAG, 2012).

12. Revealed Comparative Advantage of Crude Rubber (HS. 40.01)

Indonesia is the second largest natural rubber producer behind Thailand, but ahead of Malaysia since the last decades. In 2010, the rubber production of Indonesian was over 2.6 million ton or about one million ton lower than the rubber production in Thailand. The Revealed Comparative Advantage (RCA) value of Crude Rubber (HS. 40.01) are shown in Figure 12.



Figure 12. RCA Value of Crude Rubber

The Figure 12 showed that Indonesia has competitive advantage on crude rubber product. The RCA number mostly more than 1, but since 2011, the RCA number was going down slowly. The average of RCA in this product is 1.295242238 which is in Balassa index called Weak Revealed Comparative Advantage. The growth of rubber production in Indonesia is depend on the plantation area. While the world demand of natural rubber is growing so fast, but Indonesia cannot effort. However, the quality of rubber from Indonesia is generally not as good as the natural rubber from Malaysian and Thailand. In Indonesia there are no incentive systems and quality controls for smallholder growers to produce good quality rubber. Rubber buyers such as traders and processing factories do not treat significant price differences between good and bad quality rubber from rubber growers or share tappers.

CONCLUSION AND SUGGESTIONS

The findings of this study demonstrated that palm oil was indicated in Class D of RCA index with the highest revealed comparative advantage than others. This sector was the strongest and the most competitive commodities in Indonesia's agriculture export commodities. In class B of RCA index there were coconut oil and crude rubber. in class a of RCA index there were rice, banana, pineapple, mangoes, sugar and honey, soybeans, tobacco, cake of coconuts, and coffee.

Optimizing the competitiveness of palm oil needs to grow constantly. Facing the hard competition in economy especially for palm oil should be handle-well. The global issues about palm oil such as deforestation, habitat degradation, and climate changes must be managed as good as possible. In order to sustain the competitive position in ASEAN market, Indonesia must optimize and adopt strategic approach in superior agricultural commodities include technology, policy change, and industrial development.

REFERENCES

- Akhmadi, H. (2017). Assessment the Impact Of Asean Free Trade Area (AFTA) on Exports of Indonesian Agricultural Com- modity. *Journal of Agribusiness and Rural Development Research*, 3(No. 1). https://doi.org/10.18196/agr.3139
- ASEAN. (2017). ASEAN Economic Progress 1967-2017. 7398234. ASEAN Secretariat Jakarta
- Bella Balassa. (1965). Trade Liberalization and Revealed Comparative Advantage," Manchester School of Economic and Social Studies. In *The Manchester School* (Vol. 33).

Hinloopen, J., & Marrewijk, C. Van. (2001). On the Empirical Distribution of the

Balassa Index. 0–49.

- Ir. Dyah Riniarsi T., Ms. (2016). *Outlook Kedelai Indonesia*. Pusat Data dan Sistem Informasi Pertanian Kementerian Pertanian 2016.
- KEMENDAG. (2012). Berita PerdaganganTembakau Indonesia Mendunia. (5).
- KEMENPAN. (2012). Kementerian Pertanian. "Laporan Kinerja Kementerian Pertanian Tahun 2011",.
- KEMENTAN. (2014). Outlook Komoditi Kelapa.
- KEMENTAN. (2016a). Komoditas Pertanian Sub Sektor Hortikultura.
- KEMENTAN. (2016b). Outlook Komoditas Hortikultura Nenas.
- KEMENTAN. (2016c). Outlook Kopi Komoditass Pertanian Subsektor Perkebunan.
- Kundhavi Kadiresan. (2017). *nutrition farmers can help*. Retrieved from https://www.un.or.id/blog/81-op-eds/118-indonesians-need-better-nutritionfarmers-can-help%0D
- Porter, M. E. (2009). Improving Indonesia 's Competitiveness Presentation to President Susilo Bambang Yudhoyono Agenda for the Second Term • Improving macroeconomic foundations.
- Sukmaya, S. G. (2017). Analisis Permintaan Minyak Kelapa (Coconut Crude Oil) Indonesia di Pasar Internasional. AGRARIS: Journal of Agribusiness and Rural Development Research, 3, 1–8. https://doi.org/10.18196/agr.3138
- Thom Wright, A. R. (2017). Indonesia Oilseeds and Products Update Indonesia Oilseeds and Products Update July 2017. USDA Foreign Agricultural Services, (May).