Competitiveness Analyses between Indonesian & Malaysian Palm Oil Exports with Special Focus on Five Major Importing Countries from 2001 to 2014

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DECLARATION OF AUTHENTICITY

I hereby declare the authenticity of the thesis: I have not presented any other individual's work to obtain my university degree, nor have I presented words, ideas or expression ever written or published by others, except that in writing referred in the text and mentioned in the reference.

If in the future there is evident that this statement is not true then I am willing to accept the punishment/sanctions whatsoever in accordance with applicable regulations.

Yogyakarta, May 26, 2017



Tri Nugraha Ramadhani

MOTTO

"*Bukanlah kesulitan yang membuat kita takut tetapi ketakutanlah yang membuat kita sulit"* – Ali Bin Abi Thalib

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I am afraid that unintentionally I may have been forgotten to mention my individuals or parties who have been involved in the completion process. Thus my

deepest apologies are credited to them. I realize that this thesis is still far from perfection due the limited ability and knowledge that the writer had.

Wassalamualaikum Wr.Wb,

Yogyakarta, May 26, 2017

Tri Nugraha Ramadhani

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ABSTRACT

This study investigates the competitiveness of Indonesian and Malaysian palm oil export with special focus on five major importing countries, namely China, Singapore, India, Pakistan and Netherlands, from 2001 to 2014. The methods used are Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA) and Constant Market Share (CMS). Based on RCA and RSCA calculation, the results show that Indonesia and Malaysia have positive result. This is self-explanatory because Indonesia and Malaysia are the world's biggest palm oil producers. Yet, Indonesia's RCA and RSCA indices during 2001 to 2014 are higher than Malaysia's. It demonstrates that Indonesia's palm oil is more competitive than Malaysia. Based on CMS calculation, the findings are: Firstly, palm oil commodity is influenced by high demand during 2001 to 2014 in five major importing countries. Secondly, both countries had concentrated on the export commodity whose markets were growing relatively fast. Thirdly, Indonesia's palm oil commodity experiences a rapid growth in the selected markets while Malaysia experiences a stagnant growth. Fourthly, Indonesia's palm oil competitiveness is higher than Malaysia in five major importing countries.

Keywords: Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), Constant Market Share (CMS), competitiveness, palm oil

ABSTRAK

Studi ini meneliti daya saing ekspor minyak kelapa sawit Indonesia dan Malaysia dengan fokus khusus pada lima negara pengimpor utama, yaitu Cina, Singapura, India, Pakistan dan Belanda, dari tahun 2001 sampai dengan tahun 2014. Metode yang digunakan adalah Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA) dan Constant Market Share (CMS). Berdasarkan hasil perhitungan menggunakan RCA dan RSCA, menunjukan bahwa Indonesia dan Malaysia mempunyai hasil nilai yang positif. Hal ini karena Indonesia dan Malaysia adalah penghasil minyak kelapa sawit terbesar di dunia. Namun, indeks RCA dan RSCA milik Indonesia dari tahun 2001 sampai 2014 lebih besar dari Malaysia. Ini menunjukkan bahwa minyak kelapa sawit Indonesia lebih kompetitif daripada Malaysia. Berdasarkan perhitungan CMS, temuan menunjukkan hal berikut: Pertama, komoditas minyak sawit dipengaruhi oleh tingginya permintaan selama tahun 2001 sampai 2014 di lima negara pengimpor utama. Kedua, kedua negara telah berkonsentrasi pada komoditas ekspor yang pasarnya tumbuh relatif cepat. Ketiga, komoditas minyak sawit Indonesia mengalami pertumbuhan yang cepat di pasar yang dipilih sementara Malaysia mengalami pertumbuhan yang stagnan. Keempat, daya saing minyak kelapa sawit Indonesia lebih tinggi dari Malaysia di lima negara pengimpor utama.

Kata kunci: Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), Constant Market Share (CMS), daya saing, minyak kelapa sawit

CHAPTER I
INTRODUCTION

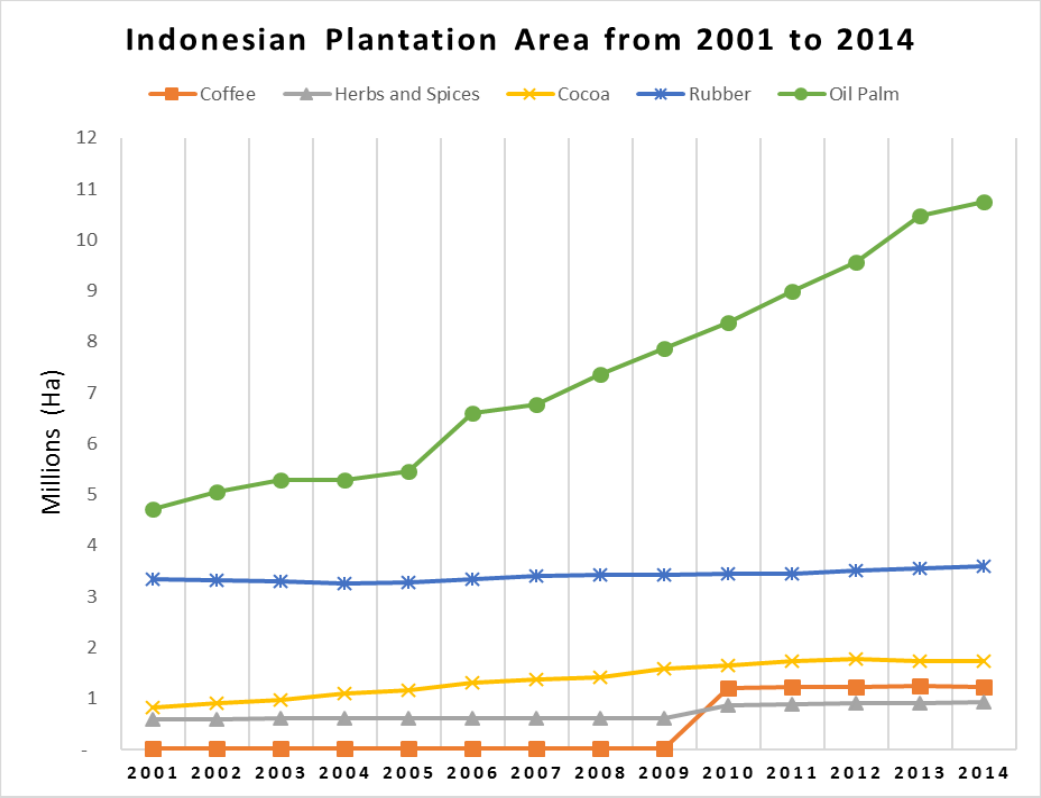
1.1 Background of the Study

During the past few decades, the Dutch colonial first introduced the oil palm to Indonesia in the 20th century. The industry of palm oil continues to grow since then. Budidarsono, Susanti and Zoomers (2013) stated that during the Dutch colonial era, oil palms were first cultivated in the east coast area of Sumatra for commercial production since 1911. USDA-FAS (as cited in Rist, Feintrenie, & Levang, 2010) asserted that under the Dutch colonial oil palms continue to increase for about 80% of total Indonesian production. A rapid growing of oil palms during the Dutch occupation in Indonesia was able to dominate the world market and it was able to shift the export capacity of African countries, which is incidentally the native habitat of oil palm. The climatic tropical condition of Indonesia support the basic requirements for the habitat environment of oil palm.

The area of oil palm plantations in Indonesia from 2001 to 2014 as shown in Figure 1.1 tends to show a fast growing increase. For 14 years, the area of oil palm plantation shows a big significance change. In 2001, the plantations for oil palm recorded covering an area of 4.71 million hectares. It increases into a whopping 10.75 million hectares in 2014 or an increase of 128 percent. The area of oil palm plantation is growing much bigger than four other superior plantation commodity exports. It indicates that the world demand for palm oil is growing rapidly due to increasing uses of palm oil products. The plantations area of oil palm

spread in some regions of Indonesia. Rianto, Pratikto, Santoso and Ponnusamy (2010) claimed that the distribution of plantation areas in 2009 was located in Kalimantan for 26%, 3% for other regions in Indonesia such as Sulawesi, Java and Papua while the most concentrated area is Sumatra for 65% of total plantation area.

Figure 1.1 Indonesian Plantation Area 2001-2014



Source: *Ministry of Agriculture Republic of Indonesia*

As shown in Table 1.1. According to the category of producer, most of the production of palm oil in 2014 produced by private estates for 16.48 million tons (57.53%). While the production of smallholder is 2.23 million tons (7.61%) and government estates produces 10.20 million tons (34.86%). The development of crude palm oil from 2007 to 2014 grows for about 6.42 percent every year. In 2007, the production of crude palm oil (CPO) is 17.80 million tons. It increases to be

29.28 million tons in 2014 or it significantly increases for 64.50 percent for seven years.

Table 1.1 Production of Oil Palm Plantation by Category of Producers in Indonesia (Tons), 2007-2014

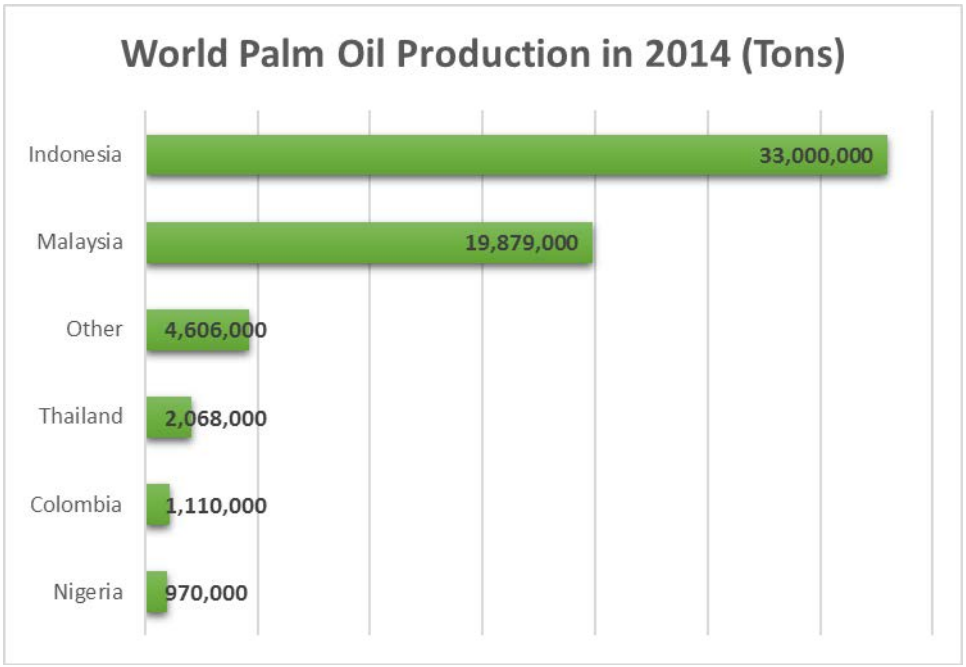
Years	Category of Producers			Production of Crude Palm Oil (CPO)
	Smallholders	Government Estates	Private Estates	
2007	6,358,388	2,174,897	9,263,089	17,796,374
2008	6,923,042	1,820,594	10,657,158	19,400,794
2009	7,517,724	1,943,212	11,929,390	21,390,326
2010	8,458,709	1,921,660	12,116,488	22,496,857
2011	8,797,925	2,154,218	13,043,830	23,995,973
2012	9,197,729	2,133,007	14,684,783	26,015,519
2013	10,010,728	2,144,651	15,626,625	27,782,004
2014	10,205,395	2,229,336	16,843,458	29,278,189

Source: *BPS-Statistics Indonesia (2016)*

Indonesia is the largest producer and consumer of palm oil in the world followed by Malaysia. Palm oil is one of plantation commodity, which has an important role for Indonesian economic activity. It is one of Indonesian export commodity, which is also important to generate foreign exchange other than oil and gas. Indonesia contributes for roughly half of world's supply of palm oil. According to Paoli et al. (2013), Indonesia generates billions of dollar in foreign exchange income annually from palm oil export as an economic engine. FAOSTAT (as cited in Petrenko, Paltseva, & Searle, 2016) claimed that Indonesia contributes for almost

half of palm oil exports in the world and become the world's number one producer of palm oil.

Figure 1.2 World Palm Oil Production in 2014 (Tons)

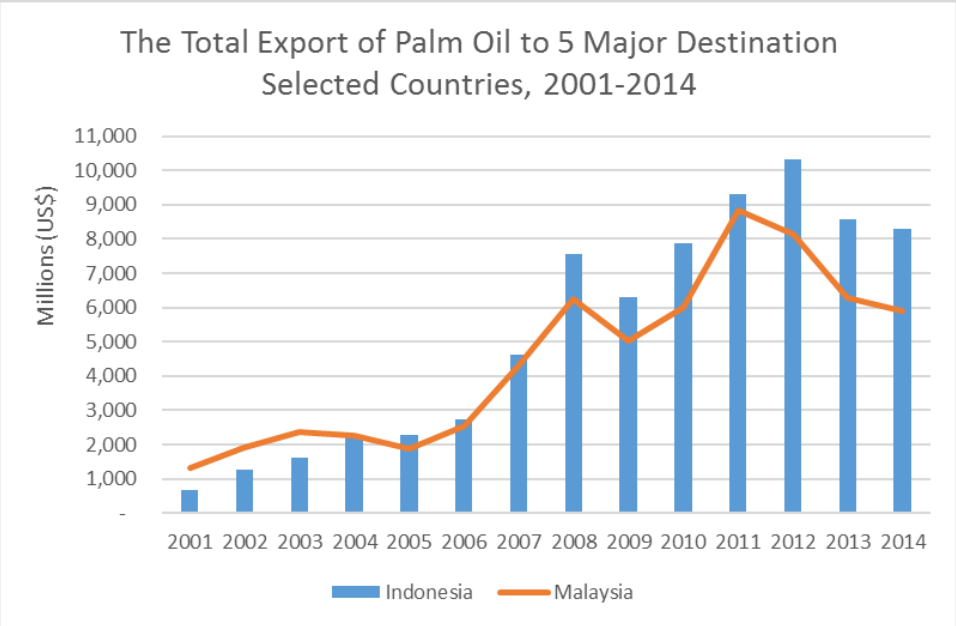


Source: (USDA Foreign Agricultural Services, 2017)

In becoming the world's king palm oil producer and exporter, Indonesia must compete with the neighboring country Malaysia that also has a positive record with palm oil exports. Indonesia and Malaysia are the two world's major countries in producing and exporting palm oil. Indonesia and Malaysia generate 86% of palm oil production globally in 2012 to 2013 (Pittman, Carlson, Curran, & Ponette-Gonzalez, 2013). As shown in Figure 1.2, Indonesia is the world's top producer of palm oil. Indonesia reached to 33 Million tons of production volume, which dominated 53.54% of world palm oil production. While Malaysia ranks second that produce only 19.88 million tons of production volume and it represents 32.25% of world palm oil production supply. Based on the report data USDA Foreign

Agricultural Services (2017), Indonesia ranks at the top in 2014 with an export volume of 25.96 million tons amounted for 54.70% of world palm oil export, while Malaysia exported 17.38 million tons and it represents 36.61% of total palm oil export in the world.

Figure 1.3 Total Export of Palm Oil to Five Major Destination Countries, 2001-2014



Source: *UN Comtrade Database*

Figure 1.3 shows a comparison of total palm oil export between Indonesia and Malaysia. In the competition to become the king of world palm oil exporter, Malaysia always shadows Indonesia especially in five major market countries, they are China, Singapore, India, Pakistan, and Netherlands. If Indonesia do not improve its marketing strategy Malaysia will surpass Indonesia. Asian countries like China, India, and Pakistan have a better prospect for palm oil, the consumption of palm oil is high due to the large population and large use of palm oil as cooking oil.

The competition is getting tighter for palm oil between Indonesia and Malaysia because the palm oil consumption in the world is increasing. The demand for palm oil is rising over the year, many products are derived from the palm oil. World Growth (2011) has given a description of the use of palm oil for edible and non-edible products. For edible products, palm oil is used to make cooking oil, margarine, noodles, baked goods, etc., while for non-edible products, palm oil is used as an ingredient in the production of biofuel, soaps, detergent and surfactants, cosmetic, pharmaceutical, and other variety of household and industrial products.

Indonesia and Malaysia now are racing to produce palm oil in high quantity amount. The high demand of palm oil use is related to consumer attention of *trans*-fat use in a food product, which increases health adverse over the year and some world organization recommend to decrease *trans*-fat consumption and substitute it with palm oil. World Health Organization (2015) claimed that there is an evidence that *trans*-fat can cause a health risk, *trans*-fat consumption increase the probability risk of coronary heart disease (CHD). Because of this reason Sanders, Balagtas, & Gruere (2013) stated that there is a change of health food policy in Europe from using *trans*-fat to switch to use palm oil in the production of food companies. Therefore, the demand for palm oil in Europe is increasing continuously for the use of food company and some countries in Europe use palm oil as an ingredient in biofuel production.

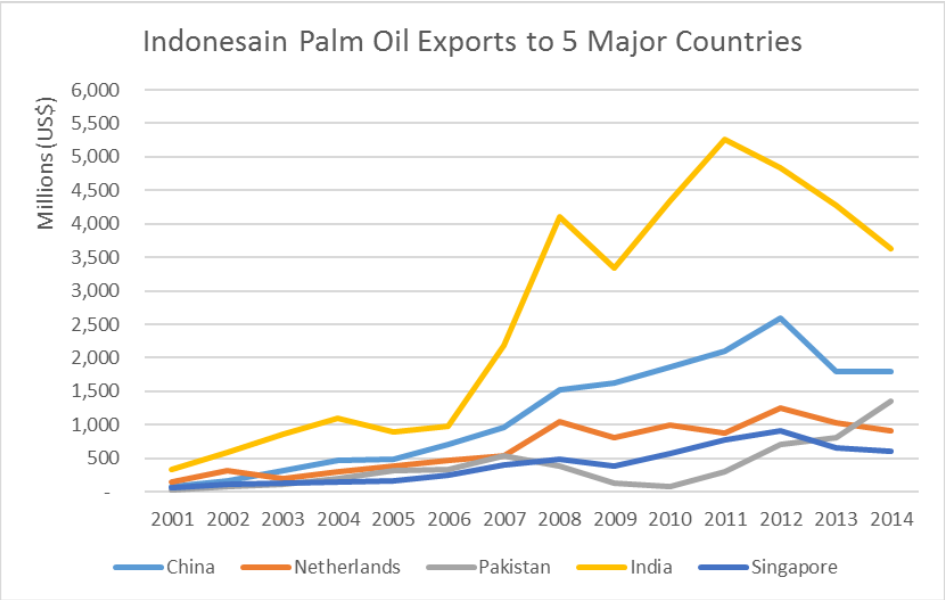
Compared to Malaysia, Indonesia has comparative advantages in exporting palm oil. First, Indonesia has an abundance of land use and labor. Now Indonesia has 10.75 million hectares area of oil palm plantation and it will expand more in the

future while the expansion of plantation area for Malaysia is limited. Second, the production cost of Indonesian crude palm oil (CPO) is much cheaper than Malaysia. A previous study conducted by Sinaga (as cited in Dewanta, Arfani, & Erfita, 2016) claimed that even though both Indonesian and Malaysian palm oil has high competitiveness in the Chinese market, the performance of the competitiveness of Indonesian palm oil is less than Malaysia. Dewanta et al. (2016) claimed that comparative advantage of Indonesian palm oil in Indian market experience a decline during the period 1990-2014. Rifin (2010) found that in the European market Malaysian crude palm oil (CPO) win its competitiveness against Indonesian CPO, Indonesia lost its competitiveness due to the black campaign by NGO in Europe. Previous research studies have motivated the researcher to undertake the study to analyze the competitiveness of Indonesian and Malaysian palm oil export in five major importing countries. The research study is formulated from the title as follows: **"Competitiveness Analyses between Indonesian & Malaysian Palm Oil Exports with Special Focus on 5 Major Importing Countries From 2001 to 2014"**

1.2 Problem Identification

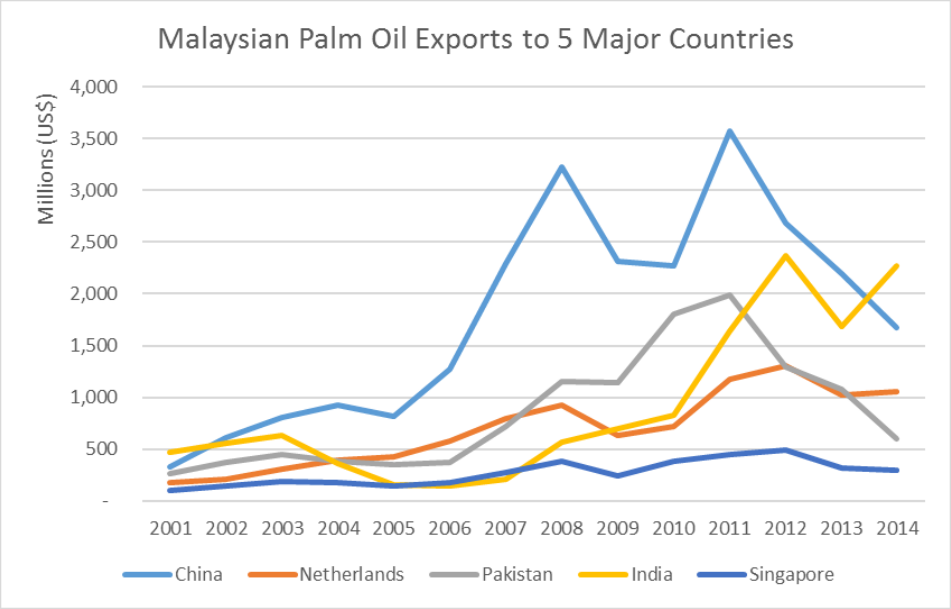
The five selected major export destination countries are China, Singapore, India, Pakistan, and Netherlands. As shown in Figure 1.4 and 1.5, the trade value export of Indonesia and Malaysia experiences a fluctuation over the years. For Indonesia, there is a decline of palm oil export in India market from 2011 to 2014 while in contrast, Malaysia experiences an increase from 2013 to 2014. For Pakistan market, Indonesia experience an increase in trade value from 2010 to 2014, on the contrary, Malaysia have a decline in trade value from 2011 to 2014. This research focused on the competitiveness between Indonesian and Malaysian palm oil export in foreign markets. The research was conducted to see the fluctuations of palm oil export value between Indonesia and Malaysia to the five major importing countries and the data was analyzed to measure the competitiveness between Indonesian and Malaysian palm oil export.

Figure 1.4 Indonesian Palm Oil Exports to Five Major Countries



Source: *UN Comtrade Database*

Figure 1.5 Malaysian Palm Oil Export to Five Major Countries



Source: *UN Comtrade Database*

1.3 Problem Formulation

Based on the background description of problem identification, the researcher raises an issue as follow: What is the competitiveness of Indonesian and Malaysian palm oil export in the five major importing countries?

1.4 Problem Limitation

The researcher limits the scope of the research on the competitiveness of Indonesian and Malaysian palm oil export in five major importing countries, namely China, Singapore, India, Pakistan, and Netherlands.

1.5 Research Objective

The research Objective is to analyze the competitiveness of Indonesian and Malaysian palm oil export in the five major importing countries.

1.6 Research Contributions

The benefits of this research, in general, is to provide an analysis of empirical evidence on the competitiveness of Indonesian and Malaysian palm oil export in the five major importing countries.

The specified benefits of this research are as follow:

1. For the government, this research can be used as an analysis to generate policy decision in the future to improve the performance of the competitiveness of Indonesian palm oil in fulfilling the world consumption of palm oil. Besides that, this research can be used to demonstrate the competitiveness between Indonesia and Malaysia so that the government can have a better insight to take future action to compete with Malaysia.
2. For the producers of palm oil that consist of smallholder, government and private estates. The need of this research is to provide information related to the performance of palm oil production, so that the producer can have estimation to utilize better technology in producing palm oil.
3. For the academician, this research can be used as a reference for academic purpose and help undergraduate students who have a similar topic of study to give additional information or knowledge for future research.

1.7 Systematics of writing

Systematic of writing describe a brief description of each chapter in the thesis. The description is as follows:

CHAPTER I: INTRODUCTION

The chapter contains Background of the research, Problem Identification, Problem Formulation, Research Objective, Research Contributions and Systematics of Writing.

CHAPTER II: REVIEW OF RELATED LITERATURE

This chapter contains theoretical review, theoretical framework, and Hypotheses formulation.

CHAPTER III: RESEARCH METHOD

This chapter describes the research method used that consist of the type of study, population and sample, data collection method, research variables and analysis technique.

CHAPTER IV: DATA ANALYSIS AND DISCUSSIONS

This chapter contains data analysis and discussions. Statistic descriptive reliability and validity test, hypothesis testing, discussion.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

This chapter contains conclusions, research limitations and recommendations.

CHAPTER II
REVIEW OF RELATED LITERATURE

2.1 Literature Review

This section explains about the previous research and aspects of various associated topics in the literature that are directly related to the researcher's study.

A previous study conducted by Arip, Yee, & Feng (2013), showed the competitiveness of downstream palm oil products in Malaysia and Indonesia. The type of export data was SITC revision 3 from 1989 until 2010, it was measured using RCA (Revealed Comparative Advantage) method. The result of the research study stated that Malaysia has been more competitive in almost all the downstream product of palm oil than Indonesia. It means that even though Indonesia has more competitiveness in its upstream product such as in S3-42221 (palm oil, crude), S3-42231 (coconut (copra) oil, crude) and S3-42241 (palm kernel or babassu oil, crude). Malaysia has more diversified product derived from palm oil and it influences the result of RCA indices in the downstream product. The result of the study also stated that both countries Indonesia and Malaysia experience a transition process according to product life cycle theory for palm oil industry.

Based on product life-cycle theory, the early stage is producing palm oil, then the palm oil started to be exported to the world market with a small amount of export volume. The oil commodity which is exported, is new product since it is still in the onset stage with high production cost because the plantation area is still limited. As a result, the economies of scale is still not achieved and inadequacy of

technology exists. The next stage is growth stage. The export volume of palm oil is increasing due to high demand for palm oil in the world and the world has recognized the product well. In this stage, the competitor starts penetrating the market with the result that the competition is getting tighter (in this case the competition is between Indonesia and Malaysia). To cope with that, the producer of palm oil broadens and increases the distribution by lowering the price. In this case, Indonesia has low production cost in result with the low price of palm oil than Malaysia. In the maturity stage, the export volume is still increasing. In this stage, the income of producer starts to decline. The price competition is very tight and the producer needs to introduce the product with the new model. Malaysia realizes that Indonesia produces and export palm oil more than they do in term of upstream product, then, Malaysia uses another strategy by producing more of downstream product derived from palm oil to make the product more diversified. While Indonesia, use defensive strategy to maintain the market for the upstream product of palm oil.

Other study conducted by Dewanta et al. (2016) analyzed the elasticity and competitiveness of Indonesian palm oil export in India market. The method used Two Step Engle-Granger Error Correction Model (ECM) using three variables, which are price, GDP, and exchange rate to measure elasticity and Revealed Comparative Advantage (RCA) method to measure the competitiveness of Indonesian palm oil Export in India market from 1995 to 2014. From the result, estimation of ECM stated that in the short term, the price factor is inelastic but in the long term, the price is elastic. It means the price of palm oil influences the

demand for Indonesian palm oil export. In the short term, the estimated price elasticity is inelastic with the result 0.86. It reflects a change in demand for palm oil equal with 0.86 times change in price. In other words, if there is 1% change in price, the demand for Indonesian palm oil will decline for 0.86%. While in the long run, the price elasticity is elastic with the result 1.14. It reflects a change in demand for palm oil is equal with 1.14 times change in price. In other words, if there is 1% change in price, the demand for Indonesian palm oil will increase by 1.14%. Moreover, the exchange rate factor also influences the demand for palm oil export in the long run. The demand elasticity of palm oil for the exchange rate is 1.34, which is elastic. The exchange rate of rupiah against the dollar determines the demand for Indonesian palm oil export in India market. If rupiah depreciates against US dollar for 1%, the demand for palm oil in India market will increase 1.34%. When rupiah depreciates, the price in a foreign market will decline and it influences the demand for palm oil to increase.

For the estimation result of RCA, Indonesian comparative advantage for palm oil in India market experiences a decline. The decline can be caused by the fluctuation of rupiah against the US dollar and another factor is because the vegetable oil price in the world is unstable. When the price of palm oil rises, it influences the demand for palm oil to be lower and it influences the volume export of Indonesian palm oil to be lower in India market. Therefore, the fluctuation of Indonesia RCA in India market resulted by two factors, which are vegetable oil price and the rupiah exchange rate against US dollar.

A similar study conducted by Rifin (2010), about the competitiveness of Indonesia's palm oil product compared to Malaysia in three region countries: Asia, Europe, and Africa for two periods 1999-2001 and 2005-2007. The method used two-step analyses: the first method was calculating the market share of Indonesia and Malaysia's palm oil product in the three regions; the second method used Constant Market Share Analyses (CMSA) to measure source of growth of palm oil using two products, which are crude palm oil (CPO) and refined palm oil. The type of export data was SITC Revision 3. The result stated that in Asian market Indonesia win its competitiveness against Malaysia for crude palm oil and refined palm oil, in European market Indonesian crude palm oil (CPO) lost its competitiveness against Malaysia but for refined palm oil, Indonesia gains competitiveness from the competitor Malaysia. Meanwhile, for African market, Indonesia win its competitiveness for both product of CPO and refined palm oil.

Furthermore Rifin (2010) explained that in three region market countries, the increasing demand for palm oil is triggered by two reasons: first, palm oil is cheaper than any other vegetable oil. In Europe, the local vegetable oil such as sunflower oil and rapeseed oil experience a poor performance which lead to a decrease production and causes the price to be higher, so the consumers prefer to buy palm oil product; second, some countries serves as a hub for other countries. The country imports the palm oil product and then re-export it to other countries. For example, in the Asian market, Pakistan serves as a hub for Kyrgyzstan, Afghanistan, Kazakhstan and other countries (Pahnoilhq, 2009, as cited in Rifin, 2010). In Europe, the Netherlands serves as a hub for other European countries

(Rifin, 2010). In Africa, Benin serves as re-export point for the neighboring countries located in western part of Africa (MPOC, 2007d, as cited in Rifin, 2010).

For the Asian and African market, the factor that mostly causes Malaysian palm oil lost its competitiveness is because Indonesian palm oil price is much cheaper than the price of Malaysian palm oil. For Asian markets, the markets are price sensitive and if there is a difference in price, the consumer will response quickly to shift or move to another supplier for palm oil. In African market, Malaysian CPO lost its competitiveness to Indonesia but in Uganda, Indonesia lost its competitiveness to Singapore. In Uganda, the only supplier of palm oil is Singapore. Singapore is not a producer of palm oil but it serves as a re-export point for Uganda, which the supply of palm oil come from Indonesia and Malaysia. Another factor is trade liberalization. In trade liberalization, Malaysia and Indonesia have an agreement with importing countries of palm oil to eliminate trade barriers such as tariff and import duty.

Other study conducted by Mohd, Ahmad, & Mohd (2011) analyzed Malaysian export competitiveness in Arab Gulf market. The type of data used was SITC data at a 3-digit level from 1998 until 2007 and the measurement of analysis used RCA index method. The study revealed that Malaysia had an advantage over Indonesia in exporting palm oil and its fraction (SITC 4222) in GCC (Gulf Cooperation Council) market. The exporters of palm oil to GCC market are Malaysia, Indonesia, and Singapore. Since Singapore is not the producer of palm oil, it can be concluded from the previous study conducted by Rifin (2010) that Singapore serves as re-export country of palm oil. Among those three countries,

Malaysia has the highest RCA index throughout the ten-year period. Despite the fact that Malaysia has an advantage over Indonesia, Indonesia's RCA index suddenly increased in 2006 and 2007 for 26.27 and 22.12 respectively. Since the previous years, Indonesia's RCA index were below two-digit number. While Malaysia's RCA index from 1998 to 2007 had two-digit value number but it experienced a decline over the year. Unlike Malaysia and Indonesia, since Singapore does not produce palm oil products its RCA index is not as great as Malaysia and its rise is not as big as Indonesia. Singapore's RCA index was one-digit value number throughout the ten-year period. Thus, the study implies that Indonesia is the nearest competitor of Malaysia among the Asian countries in the Gulf market.

Sari (2010) measured the RCA index and Constant Market Share (CMS) of Indonesian palm oil in ASEAN market. The data based on HS-Code 6 digits from 2004 until 2008. The data used was: palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm kernel oil or Babassu oil and their fractions, crude, not chemically modified; and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329). The result of the study shows that the palm oil commodity 151110 has high RCA value since Indonesia mainly focus on CPO but for commodity 151190, the RCA value was low in starting point 2004 and 2005. It can be inferred that the RCA value is low in 2004 and 2005 might be the effect of starting point of oil palm cultivation, the next year 2006, 2007 and 2008 the RCA value increase because of the expansion of oil palm plantation area. For commodity

151321 and 151329, the RCA values are higher. The high RCA value indicated that the demand for palm oil is increasing due to production use for biodiesel and other oleochemical materials.

Constant Market Share (CMS) analysis revealed that there is a positive effect, the world export growth and competitiveness toward all commodity types of palm oil exported during 2004 until 2008. It implies that Indonesian palm oil can respond to the demand in the market since it has abundance supply of palm oil commodities and it was boosted by a large plantation of oil palm during 2004-2008. Thus, Indonesia was able to adapt and respond to the supply situation in the changing market to the ASEAN condition.

Obado (2008) studied the competitiveness of Indonesian crude palm oil in the world market. One of the measurement tools used was RCA index. The result of the study revealed that Indonesia had high competitiveness in China and India markets in 2004 until 2005. The RCA of Malaysia also showed high value in those two markets, it indicated that Indonesian CPO had a strong competition against Malaysian CPO. Meanwhile for other competitors such as Thailand and Hong Kong had low RCA value in those two markets, it demonstrated that Thailand and Hong Kong did not jeopardize Indonesian CPO competitiveness in the two markets. Therefore, in China and India markets, Malaysia alongside Indonesia are highly competing.

Sulistyanto & Akyuwen (2011) analyzed the factors affecting the Indonesia's performance of CPO export using multiple regression as a main analyzing tool with 38 years data. The data used were Indonesia's CPO export value

and volume. The result showed that from 1987 to 2007, the production of Indonesian CPO has increased from 1,380,000 tons to 16,800,000 tons, while Malaysia's production of CPO increased from 4,533,000 tons to 15,740,000 tons. Despite the fact that Indonesia's production of CPO is higher than Malaysia, Indonesia's productivity of palm oil plant is still lower compared to other countries. The productivity of palm oil plant for Indonesia is 3.70 tons in 2007 while Malaysia is 4,15 tons per hectares and Columbia is 3.90 tons per hectares. Other result revealed that in European market, Indonesia's share of CPO experiences a decline to only 9% in 2008, of which share previously was 15% in 2005. The decline is due to black campaign in Europe that influence the export volume of Indonesian CPO.

2.2 Theoretical Framework

2.2.1 Theory of International Trade

International trade is an economic activity related to export and import for goods and services with foreign countries (Rugman, Collinson, & Hodgetts, 2006). By this definition, International trade is a trade between two parties that come from the different country under the agreement, which has been agreed together. The party that engages in international trade can be individual, company or government. Many countries engage in international trade because they cannot fulfill the domestic demand for certain goods and services, the only way to fulfill the domestic demand of certain goods is importing goods from foreign countries, which is not available in the domestic country.

Hill (2013) stated that economic well-being of a country might increase if the country import products from a foreign country, since international trade enables countries to specialize in exporting a certain products that they are good at and abundant and importing products which other countries are best at. Vijayasri (2013) asserted that the economic growth of a country can be positively affected by international trade in the following ways:

1. Entrepreneurs who engage in the global economy are likely to have an easy access for managerial technological know-how to improve their productivity.
2. International trade enables to decrease the poverty level in the way that international trade generate financial resources to be utilized for better economic well-being, health, and education aimed for the poor people.

2.2.2 Absolute Advantage Theory

Theory of absolute advantage is a theory that explains that a nation will gain the benefit of international trade if the country specialized in a product which produces more efficiently than any other country (Rugman et al., 2006). According to the theory, a country can gain an absolute advantage from another country if the country produces goods or services that any other country cannot produce. For instance, Indonesia produces batik clothes and it does not produce automobiles. Conversely, Japan produces automobile but they do not produce batik clothes. Therefore, international trade occurs in both country between Indonesia and Japan if they are willing to exchange batik clothes and automobiles.

Table 2.1 Illustration of Theory of Absolute Advantage

Labor cost (hours) of production for one unit

	Cloth	Grain
North	10	20
South	20	10

Source: Rugman et al. (2006)

Another example as illustrated in Table 2.1 assume that there are two countries, they are North and South. Both countries produce two goods, they are cloth and grain. Lower labor-hours per unit of production means lower production cost and higher labor productivity. It means that the country with lower labor-hours is having an efficiency in production. As shown by the data in Table 2.1, North has an absolute advantage in cloth since the cost only required 10 labor-hours, compared to the south the cost is 20 labor-hours. While South has an absolute advantage in grain since the cost only required 10 labor-hour, compared North that cost for 20 labor-hour. The gain in international trade occurs if both countries specialized and exchange cloth and grain.

2.2.3 Comparative Advantage Theory

Gupta (2009) stated that unlike the theory of absolute advantage, the theory of comparative advantage only needs higher relative productivity than absolute productivity in producing a commodity. Based on the theory, international trade happens if two countries have a different comparative advantage. A country has a comparative advantage in producing goods if the opportunity cost is low than another country (Krugman, Obstfeld, & Melitz, 2012). The theory implies that a comparative advantage will be achieved if a country is able to produce more goods

and services with lower cost than another country. For example, Indonesia and Malaysia produce the same goods such as palm oil and coffee. Indonesia can produce palm oil more efficient with low cost but it cannot produce coffee with low cost. Conversely, Malaysia is able to produce coffee with lower cost but it cannot produce palm oil efficiently. Therefore, Indonesia has a comparative advantage in producing palm oil and Malaysia has a comparative advantage in producing coffee. Both countries will gain in trade if they exchange palm oil and coffee.

Table 2.2 Illustration of Theory of comparative advantage

Labor cost (hours) of production for one unit

	Cloth	Grain
North	50	100
South	200	200

Source: Rugman et al. (2006*)*

Another example is presented in Table 2.2, which gives an illustration of the theory of comparative advantage. As shown in the table, North has an absolute advantage in both commodity products which are cloth and grain. According to the theory of absolute advantage, the trade will not occur because South does not have an absolute advantage at all. In comparative advantage theory, the trade can still occur considering the difference in relative cost of production. The cost for one unit cloth in the north is 0.5 (50 cloth/100 grain) hours of grain, one unit of cloth can be exchanged for a half unit of grain. In South, one unit of cloth cost 1 (200 cloth/200 grain) hours of grain, or one grain unit. The trade will gain if North can import more than a half unit of grain for 1 unit of cloth. Similarly, if the South can import one

unit of cloth for less than 1 unit of grain, the south also gain from trade. Therefore, each country will gain from trade if there is an agreement to export more than a half unit of grain in return for importing 1 unit of cloth and export 1 unit of cloth in return for importing less than 1 unit of grain.

2.2.4 Heckscher-Ohlin Theory

Rugman et al. (2006) explained that the Heckscher-Ohlin theory is a continuation theory from comparative advantage theory that states a nation with relatively high labor or capital intensive is determined by its factor endowment and cost of factor of production. This theory implies that every country will specialize in product, export the commodity product which uses a large amount of production factor with relatively cheap and abundant in the country, and import the commodity product which relatively expensive and scarce in the country. Hill (2013) explained about the factor endowment that every country is endowed with varying resources such as land, labor and capital and every country has different cost of factor endowment, the more abundant the factor the lower its cost. Therefore, Hecksher-Ohlin theory alleges that the international trade is influenced by the differences of country's' factor endowment instead of differences in productivity.

2.2.5 Leontief Paradox Theory

Wassily Leontief, a noble prize economist, found Leontief paradox theory, which the Hecksher-Ohlin theory is contradicted with the empirical study of which shows that the United States exports relatively more labor-intensive goods and imports capital intensive goods (Rugman et al., 2006). Based on the Leontief theory, United States has abundant in capital compared to other countries, the

United States should export more in capital-intensive goods and import labor-intensive goods but shockingly, he found that United State exports are less capital-intensive than import. Since the Hecksher-Ohlin theory is different with the reality of U.S, it is now known as Leontief Paradox.

2.3 Hypothesis Formulation

The research hypothesis is: Indonesian palm oil more competitive against Malaysian palm oil in five major importing countries.

CHAPTER III
RESEARCH METHOD

3.1 Type of Study

The type of study used for this research is the quantitative approach. The quantitative research uses numerical data or the data that can be converted into useable statistics. It is used to simplify the complex reality problem into a model. The type of data used in this research is secondary data. Secondary data is a source of data which is obtained by the researcher through the intermediary medium. The researcher used secondary data because it is time and cost saving and it is easily accessible.

3.2 Data Collection Method

This research used HS Code data at a 4-digit level which is 1511 (palm oil and its fractions, whether or not refined, but not chemically modified). Data were obtained online from UNCOMTRADE and it was analyzed purposely for this study. The analysis is taken between 2001 and 2014. The specified data are:

1. Indonesian data:
    a. Indonesian palm oil export (1511) to China, Netherlands, Pakistan, India and Singapore in US$.
    b. Total Indonesia's all commodities export to China, Netherlands, Pakistan, India and Singapore in US$.

2. Malaysian data:
    a. Malaysian palm oil export (1511) to China, Netherlands, Pakistan, India and Singapore in US$.
    b. Total Malaysia's all commodities export to China, Netherlands, Pakistan, India and Singapore in US$.
3. World data:
    a. World palm oil export (1511) to China, Netherlands, Pakistan, India and Singapore in US$
    b. Total world's all commodities export to China, Netherlands, Pakistan, India and Singapore in US$.

3.3 Analysis Technique

3.3.1 Revealed Comparative Advantage (RCA)

Arip, Yee, and Feng (2013) claimed that the researchers analyze the export share of certain country's product in the market mostly use Revealed Comparative Advantage (RCA). According to Balassa (1965) cited in Arip, Yee, and Feng (2013) RCA is a tool to measure a country's comparative advantage based on the ratio of the country's of certain commodity export over the worlds' export. International economics use RCA to calculate the relative advantage or disadvantage of a product in a certain class of goods or services (Granabetter, 2016). The formula for Balassa's index of RCA is as follows (Abu Hatab & Romstad, 2014):

$$\boldsymbol{RCA_{ad}} = \frac{(\boldsymbol{X_{ad}/X_a})}{(\boldsymbol{X_{wd}/X_w})}$$

Where RCA_{ad} is revealed comparative advantage for commodity d of country a; X_{ad} is the export commodity d of country a; X_a is the total export of country a; X_{wd} is total world export of commodity d; X_w is the total world export.

Therefore, the RCA for this research is defined as follow:

RCA_{ad}: Revealed comparative advantage for palm oil commodity of Indonesia or Malaysia.

X_{ad} : Indonesian or Malaysian export of palm oil to five major importing countries

X_a : Total Indonesian or Malaysian export of all commodities to five major importing countries

X_{wd} : World palm oil export to five major importing countries

X_w : Total world's export of all commodities to five major importing countries.

The country has a revealed comparative advantage if the ratio is more than one but if the value of RCA index is less than one, it indicates that the country has revealed comparative disadvantage.

3.3.2 Revealed Symmetric Comparative Advantage (RSCA)

According to Amir et al. (2016), the value between zero and one of RCA calculation is a lack of specialization, it has a risk of non-normality and regression analysis using RCA gives too much weight value more than one. Since the distribution of RCA is not symmetrical, Laursen (cited in Amir, et al., 2016) suggested a simple transformation of RCA called Revealed Symmetric Comparative Advantage (RSCA) as follows:

$$\boldsymbol{RSCA} = \frac{\boldsymbol{RCA} - \mathbf{1}}{\boldsymbol{RCA} + \mathbf{1}}$$

The interval result of RSCA is between -1 to 1. The result of ratio analysis is the same as the old RCA. If the ratio is greater than zero, it indicates that the country has revealed comparative advantage. Conversely, if the result is less than zero, the country has revealed comparative disadvantage.

3.3.3 Normality Test

Normality test was conducted with the purpose of assessing the data distribution in a data set or variable, whether the data is normally distributed or not with the result that the data is usable in statistics. Jarque-Bera method is widely used to conduct normality test on the observation data (Hakim, 2014, p. 59). Jarque-Bera method used skewness and kurtosis calculation based on a big sample, which is assumed asymptotic (Widarjono, 2016, p. 49).

The hypotheses used are as follow:

H_0: Data are normally distributed

H_1: Data are not normally distributed

The critical value is $\varkappa^2$ and the degree of freedom is 2. The value test can be calculated using the formula as follows:

$$JB = n\left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right]$$

Where:

n: Number of samples

S: Skewness

K: Kurtosis

The decision to reject or accept H_0 is as follow:

If JB value > critical value or chi-squares table. Then, reject H_0

If JB value < critical value or chi-squares table. Then, accept H_0

3.3.4 Sample Paired T-Test

Sample paired T-test is used to compare the average of two variables for a single sample group. This test calculates the difference between the values of two variables for each case and examines whether the average difference is zero.

Criteria data for paired sample T-test are:

1. Data for each pair tested in the interval or ratio scale.
2. The data is normally distributed
3. The variant value can be the same or not the same.

Paired T-test, in general, is to examine the differences between the two observations. The test is conducted on tested subject in the situation before and after the process, or paired subjects, or similar. For instance, we want to test the height of a person before taking the supplement nor after taking the supplement.

The formula used to find the t value in sample paired T-test is as follows:

$$t = (\overline{X} - \overline{Y}) \sqrt{\frac{n(n-1)}{\sum_{i=1}^{n} (\hat{X}_i - \hat{Y}_i)^2}}$$

Sample paired T-test use the degree of freedom n-1, where n is a number of samples. The hypotheses used in sample paired T-test are:

H_0: $\mu_{Indonesia} \leq \mu_{Malaysia}$

H_1: $\mu_{Indonesia} > \mu_{Malaysia}$

The decision to reject or accept H_0 is as follows:

If t value > t critical or t table. Then, reject H_0

If t value < t critical or t table. Then, accept H_0

3.3.5 Constant Market Share Analysis

Constant Market Share Analysis is a measurement tool to measure the dynamic of competitiveness level of a country's product (Tambunan & Tulus, 2000, as cited in Suhana, Kusumastanto, Adrianto, & Fahrudin, 2016). Constant Market Share is used as an analysis model to determine competitive advantage or export competitiveness in the world market. According to Leamer & Stern (1970), the method of CMS analysis is based on the assumption that the market share of a country in the world market is constant all the time. Following Leamer & Stern

(1970) the export analysis of a country between two periods is broken down into the following parts:

$$V' - V \equiv \underbrace{\sum_i rV_{.j}}_{(1)} + \underbrace{\sum_i (r_i - r)\, V_{.j}}_{(2)} + \underbrace{\sum_i \sum_j (r_{ij} - r_i) V_{ij}}_{(3)} + \underbrace{\sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} V_{ij})}_{(4)}$$

Where *V'* is the value of *A*'s export in period 2; *V* is the value of *A*'s export in period 1; *r* is percentage increase in total world exports from period 1 to 2; $V_{.j}$ is the value of *A*'s export to country *j* in period 1; r_i is percentage increase in world exports of commodity *i* from period 1 to period 2; r_{ij} is percentage increase in world exports of commodity *i* to country *j* from period 1 to period 2; V_{ij} is the value of *A*'s export of commodity *i* to country *j* in period 1; V'_{ij} is the value of *A*'s export of commodity *i* to country *j* in period 2.

Therefore, the definition related to Constant Market Share for this research is defined as follows:

V' = value of Indonesia's export in period 2 (2014);

V = value of Indonesia's export in period 1 (2001);

r = percentage increase in total world exports from period 1 (2001) to period 2 (2014);

V_j = value of Indonesia's export to five major importing countries (China, Netherlands, Pakistan, India and Singapore) in period 1 (2001);

r_i = percentage increase in world exports of palm oil and its fractions, not chemically modified (HS 1511) from period 1 (2001) to period 2 (2014);

r_{ij} = percentage increase in world exports of palm oil and its fractions, not chemically modified (HS 1511) to five major importing countries (China, Netherlands, Pakistan, India and Singapore) from period 1 (2001) to period 2 (2014);

V_{ij} = value of Indonesia's exports of palm oil and its fractions, not chemically modified (HS 1511) to five major importing countries (China, Netherlands, Pakistan, India and Singapore) in period 1 (2001);

V'_{ij} = value of Indonesia's exports of palm oil and its fractions, not chemically modified (HS 1511) to five major importing countries (China, Netherlands, Pakistan, India and Singapore) in period 1 (2014).

The four parts of Constant Market Share identity decompose a country's exports into four effects, they are:

(1). World trade effect, which relates any change to *A*'s actual export to a general rise in world exports.

(2). Commodity composition effect, which indicates the extent to which *A*'s exports differential because of specialization in a specific commodity where its export demand is growing faster than the world average.

(3). Market distribution effect, which measures whether country *A*'s export concentration in the destination market is experiencing relatively rapid growth than the world average.

(4). Competitiveness effect, which reflects the difference between the actual export growth and the growth that would have occurred if *A* had maintained its share of the exports of each commodity to each country.

Leamer & Stern (1970) explained the interpretation of commodity composition effect that if the result is positive, it means that *A* had concentrated on the export commodities whose markets were growing relatively fast and if the result is negative, it means that *A* had concentrated in slowly growing commodity markets. Aswicahyono and Pangestu (as cited in Suhana et al., 2016) give additional information that if the result is positive, it indicates that the country's export of certain commodity increases due to increasing demand for the commodity.

Furthermore, Leamer & Stern (1970) has also given an interpretation of market distribution effect, if the result is positive, it means that *A* had concentrated its exports in markets that were experiencing rapid growth while the result will be negative if *A* had concentrated in more stagnant regions. Aswicahyono and Pangestu (as cited in Suhana et al., 2016) also added that the positive result indicates that the growth of export of a certain country results from the right market selection. On the other hand, a negative result indicates that the country's export in the selected markets does not grow as fast as the growth of the world.

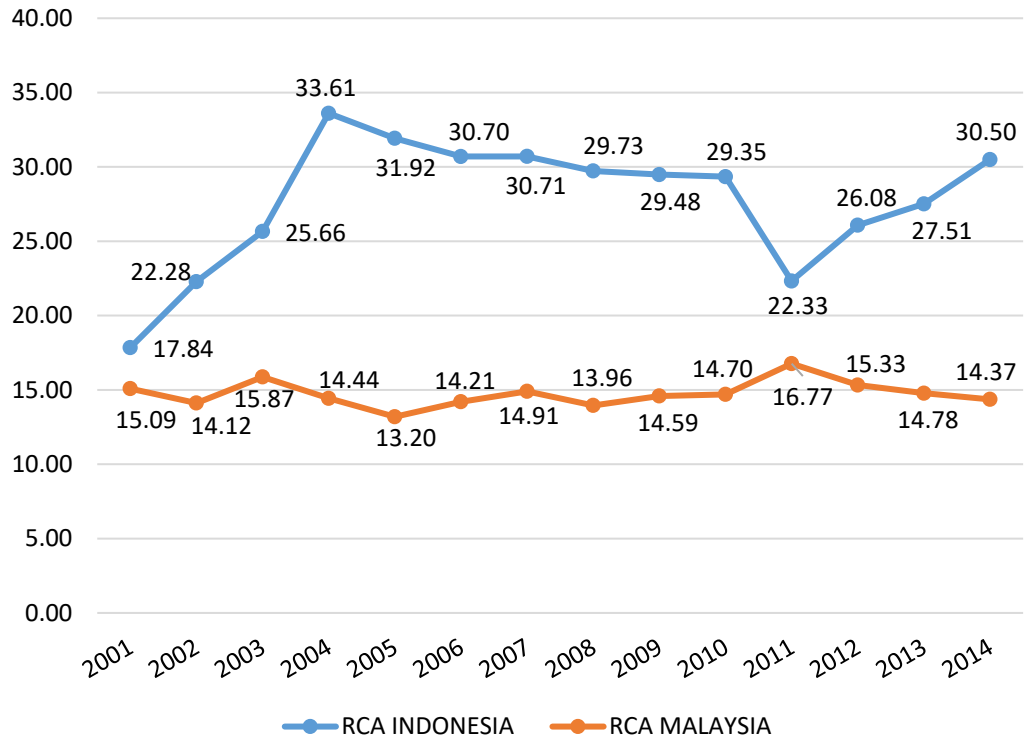
The interpretation of the competitiveness effect according to Leamer & Stern (1970) is that a negative result is reflecting a failure to maintain the market share where it is necessarily associated with a rise in relative prices. Aswicahyono and Pangestu (as cited in Suhana et al., 2016) stated that if exports by country *A* of product *i* to country *J* is experiencing a rapid growth than other countries' exports to certain countries, it leads to an increase in *A*'s market share in the country *J*. It means that a certain commodity of country *A* has higher competitiveness.

CHAPTER IV
DATA ANALYSIS AND DISCUSSIONS

4.1 The Analysis of export competitiveness

4.1.1 Revealed Comparative Advantage (RCA) Result Analysis

Figure 4.1 RCA Indices of Indonesian & Malaysian Palm Oil Export to Five Major Importing Countries, 2001-2014



Source: Author's calculation (see Appendix C: Table C1)

Figure 4.1 shows estimated result for Revealed Comparative Advantage (RCA) indices for Indonesia and Malaysia. The result shows that for the last fourteen years, Indonesia and Malaysia recorded high RCA indices in five major importing countries, they are, China, Netherlands, Pakistan, India, and Singapore. This is self-explanatory because Indonesia and Malaysia are the world's biggest

palm oil producers. Indonesia won its competitiveness over Malaysia during 2001 to 2014, which is shown by the value of Indonesia's RCA indices that is higher than Malaysia. Yet, Malaysia also recorded to have more stable RCA indices during 2001 to 2014 in the same market. It has proven that Malaysia is also competitive in the market alongside Indonesia.

From 2001 to 2004, Indonesia's RCA increased into a whopping from the value 17,84 to 33,61. While during those years, Malaysia did not show any significant increase for the RCA indices, its RCA value from 2001 to 2004 is 15.09 to 14.44. Malaysia's RCA indices experience a decrease to 0.65 points during those years. It might due to the massive expansion of oil palm plantation areas by Indonesia with the support of the government in many strategies to improve palm oil industry, while Malaysia has limited oil palm plantation areas.

Indonesia's RCA experienced a decrease during 2005 to 2010, which its RCA value respectively is 31.92 to 29.35. Indonesia's RCA decreases to 2.57 points. In contrast, Malaysia experienced an increase of 1.5 points for the RCA value, which its value from 2005 to 2010 respectively is 13.20 to 14.70. The decrease for Indonesia's RCA during those years might be due to the black campaign by NGO (Non Governmental Organization) in Europe especially in Netherlands. Firman Subagyo, Member of Commission IV of the House of Representatives, asserted that Mighty Earth (NGO from United States) and AidEnvironment (NGO from Europe or Netherlands) are two NGOs that actively attack indonesian palm oil industry by doing a black campaign about the industry (as cited in Novriansyah, 2017). The black campaign towards palm oil industry is

related to the environmental damage or deforestation that may threaten the habitat for many endangered species. Based on the previous research conducted by Rifin (2010), during 2005 until 2007, Indonesia experienced a decline in CPO market share in the western Europe due to the black campaign, in the European countries, such as Netherlands, Germany, Spain, France, and Belgium. Sulistyanto & Akyuwen (2011) also expressed the same idea that in European market Indonesia experienced a decline in crude palm oil started from 2005 to 2008. Thus, the black campaign in Europe such as in Netherlands has influenced the RCA value for Indonesia to decrease during 2005 to 2010. Even though during those years Malaysia did not need to compete with Indonesia, but Malaysia benefited from the loss of Indonesia's competitiveness in Netherlands to raise Malaysia's RCA value.

From 2011, Indonesia's RCA value experienced a decline for 7.02 points. The RCA value in 2011 is 22.33, in 2010 is 29.35. On the contrary, Malaysia experienced an increase to 16.77, the RCA value increased for 2.07 points. The decrease of RCA value for Indonesia was due to a decrease in export value in 2011 to five major importing countries that reached 1.45 billion US$. It is because there was a decline in Indonesian palm exports to Netherlands in that year. Malaysia, on the contrary, had an increasing exports value for palm oil in 2011, the increase amounts to 2.8 billion US$. This condition occurred because the exports performance of Malaysian palm oil to five major countries increased.

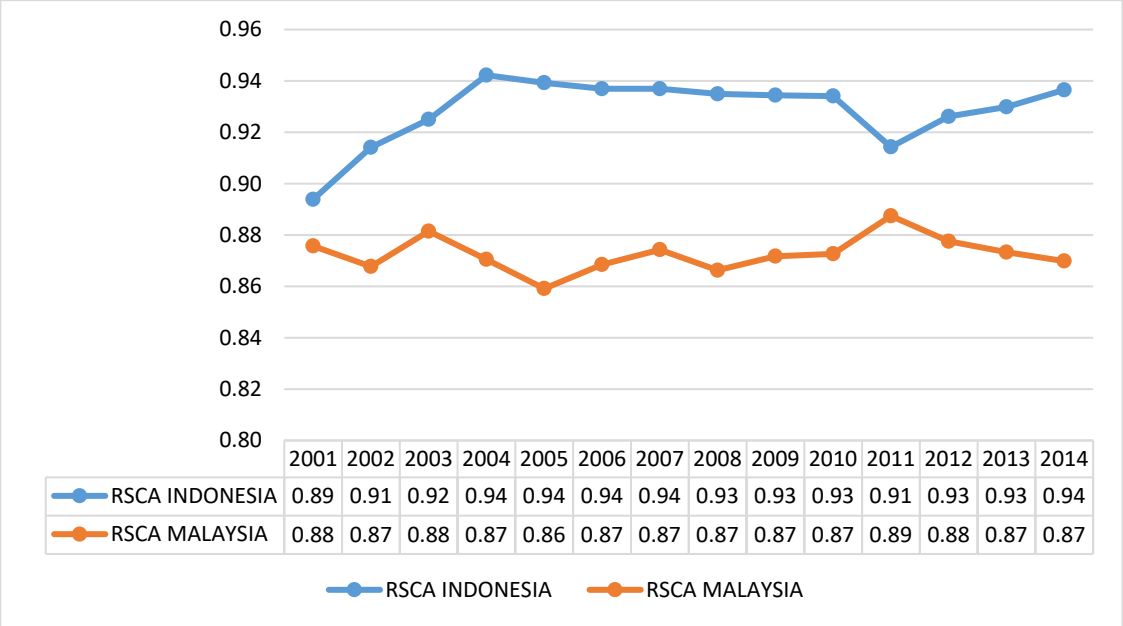
From 2012 to 2014, Indonesia's RCA value rose. The RCA value in 2012 to 2014 respectively was 26.08 to 30.50. After experienced a decline in 2011, Indonesia succeeded to reach its competitiveness to the high level in 2014 and

regained the trust from the market as the best palm oil producer in the world. Malaysia's RCA in 2012 to 2014 was 15.33 and 14.37. It means that Malaysia's competitiveness of palm oil was decreasing. As a matter of fact, the market recognizes palm oil product from Indonesia is better than Malaysia. It is because Indonesia has cheap labor cost and it causes the price of Indonesian palm oil is lower than its competitor, Malaysia. Not to mention, Indonesia has a vast oil palm plantation area scattered in many islands of Indonesia while Malaysia has limited plantation land.

4.1.2 Revealed Symmetric Comparative Advantage (RSCA) Result Analysis

Since the calculation of RCA has no absolute limit and it might suffer from non-normality risk, this research also uses another tool of analysis similar to RCA, which is RSCA, that may normalize estimated RCA results to be more symmetrical.

Figure 4.2 RSCA Indices of Indonesian & Malaysian Palm Oil Export to Five Major Importing Countries, 2001-2014



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RSCA INDONESIA	0.89	0.91	0.92	0.94	0.94	0.94	0.94	0.93	0.93	0.93	0.91	0.93	0.93	0.94
RSCA MALAYSIA	0.88	0.87	0.88	0.87	0.86	0.87	0.87	0.87	0.87	0.87	0.89	0.88	0.87	0.87

Source: Author's calculation (see Appendix C: Table C1)

Figure 4.2 shows the estimated result of RSCA for Indonesia and Malaysia from 2001 to 2014. The result shows that both Indonesia and Malaysia recorded positive value of RSCA, it means that both countries have competitiveness towards commodity 1511 (palm oil and its fractions, not chemically modified). The result of RSCA is in line with the result of RCA, which shows that Indonesia and Malaysia have positive value but in more symmetrical indices result. Indonesia has high competitiveness over Malaysia during 2001 to 2014 in five major importing countries. This finding is also the same as RCA calculation as shown in Figure 4.1.

From 2001 to 2004, the competitiveness level of Indonesian palm oil commodity increased. The competitiveness level of Malaysia's palm oil during this period still fluctuated with unstable RSCA indices result. Starting from 2005, Malaysia's RSCA value tended to decrease to the value 0.86 while Indonesia had

competitiveness against Malaysia with RSCA value 0.94. Starting from 2006 to 2007, Malaysia experienced an increase in competitiveness with RSCA value is 0.87 but Indonesia's palm oil competitiveness was still on top of Malaysia with the RSCA indices value that was stable during 2005 to 2007 which was 0.94.

From 2008 to 2010, the RSCA value of Indonesia and Malaysia were constant, the values of RSCA indices are 0.93 and 0.87 respectively. In 2011, the competitiveness level of Indonesian palm oil tended to decline to the value of 0.91 while Malaysia experienced an increase in RSCA indices to the value 0.89. On the contrary, compared to the period of 2012 to 2014, Indonesia's RSCA value experienced a steady grow with the value grew from 0.93 to 0.94 while Malaysia during that period experienced a decline indicating that the competitiveness for Malaysian Palm oil is decreasing.

4.1.3 Constant Market Share (CMS) Result Analysis

This analysis examines Constant Market Share of Indonesian and Malaysian Palm Oil Commodity (1511) within 2001-2014 to five major palm oil importing countries namely, China, Netherlands, Pakistan, India, and Singapore. The result of commodity examined is shown in Table 4.1.

Table 4.1 Constant Market Share (CMS) Analysis of Indonesian and Malaysian Palm Oil, 2001-2014

Value in thousand US$

	CMS Decomposition	Value	Share
		Indonesia	
I	World Trade Effect	2,352,505	31%
II	Commodity Composition Effect	377,643	5%
III	Market Distribution Effect	2,304,031	30%

	CMS Decomposition	Value	Share
		Indonesia	
IV	Competitiveness Effect	2,600,368	34%
	Change in Export (I + II + III + IV)	7,634,549	100%
		Malaysia	
I	World Trade Effect	14,899,620	326%
II	Commodity Composition Effect	10,268,457	225%
III	Market Distribution Effect	-17,072,478	-373%
IV	Competitiveness Effect	-3,522,472	-77%
	Change in Export (I + II + III + IV)	4,573,128	100%

Source: Author's calculation (see Appendix D: Table D2 & D3)

Based on Table 4.1, it is suggested that palm oil commodity was influenced by high demand in 2001-2014. This is seen from the positive result of world trade effect for Indonesian and Malaysian palm oil. The values of world trade effect of Indonesia and Malaysia were 2,352,505 (thousand US$) and 14,899,620 (thousand US$) during 2001-2014. It indicates that the increase of world exports give a positive impact on the increase of Indonesian and Malaysian Palm Oil commodity 1511 exports. Malaysia's world trade effect was higher than Indonesia because the portion of percentage increase in total world exports was bigger. The overall effect for both countries was dominated by the world growth effect, in the case of Malaysia, world trade effect is higher than the actual export growth. It is indicating that the relevant country is unable to take advantage of globalization effect efficiently because it has weaknesses in domestic policy (Mahmood, 2015).

Commodity composition effect for both Indonesia and Malaysia was positive. This trend highlights that both countries had concentrated on the export commodity whose markets were growing relatively fast. Other reason is both countries' export of palm oil commodity increased was due to the increasing

demand for the commodity. Palm oil commodity as shown in Figure 1.4 and 1.5 had a rapid growth for Indonesian and Malaysian export to five major importing countries. The increase of this commodity during 2001-2014 was mainly driven by palm oil usage as a cooking oil in Asian countries such as China, India, and Pakistan. Palm oil commodity experienced a rapid growth in China, India, and Pakistan due to steady economic growth that was supported by a large number of population (Rifin, 2010). While in Europe such as Netherlands, the demand for palm oil was likely used as a biofuel and vegetable oil for processed food items in food companies. Malaysia's commodity composition effect is higher than that of Indonesia due to higher growth rates than the average rate.

In market distribution effect, Indonesia had a positive result. The trend highlights that Indonesia had concentrated its exports in markets that were experiencing rapid growth. Other reason is because Indonesia's growth of export results from the right market selection. On the contrary, Malaysia has a negative effect, it indicated that Malaysia had concentrated in more stagnant regions. The trend is likely to happen because Malaysia's export in the selected markets did not grow as fast as the growth of the world.

The demand growth of Malaysia's palm oil was slower in the selected market countries (five major palm oil importing countries) than global average while Indonesian palm oil growth demand was higher in the selected market countries (five major palm oil importing countries) than the global average (see figure 1.3). Hence, the conclusion is drawn that the stagnancy in destination countries (namely, China, Netherlands, Pakistan, India, and Singapore) for

Malaysia's export palm oil commodity (1511) is lower than the world increase with the same commodity export to those countries (five major palm oil importing countries).

The competitiveness effect is positive for Indonesia. It implies that Indonesia succeeded to maintain its market share in the five major palm oil importing countries. This trend highlights the fact that Indonesia can respond to the changing world market situation and fulfill the amount of supply needed. Other reason is the massive expansion strategy of oil palm plantation area by Indonesian government (see Figure 1.1) to produce palm oil in a tremendous amount of quantity. On the contrary, Malaysia has a negative result of competitiveness effect. It indicates the fact that Malaysia failed to maintain the market share in the five major palm oil importing countries. This trend is associated with the rise of relative price (Leamer & Stern, 1970). The price of Indonesian palm is cheaper than that of its competitor Malaysia. Palm oil market in Asian countries such as China, India, and Pakistan is price sensitive, an increase in price will influence the buyer to purchase from another supplier (Rifin, 2010).

Based on the trend of competitiveness effect, Aswicahyono and Pangestu (as cited in Suhana et al., 2016) asserted that if exports by country *A* of product *i* to country *J* is experiencing a rapid growth than other countries' exports to certain countries, it leads to an increase in *A*'s market share in the country *J*. It means that a certain commodity of country *A* has higher competitiveness. In this case, Indonesian palm oil exports to five major palm oil importing countries experience a rapid growth than that of its competitor Malaysia. It highlights that Indonesia's

market share in five major palm oil countries increases. It means that Indonesian palm oil commodity (1511) has higher competitiveness over Malaysia.

The actual growth export (change in export) of Indonesia is higher than Malaysia because all components in constant market share show a positive result. While Malaysia's actual growth export is relatively small due to other components such as market distribution effect and competitiveness effect are negative. It shows that Malaysia concentrated on export while markets were growing relatively slow during 2001-2014 and Malaysian palm oil commodity lost its competitiveness against Indonesia.

4.2 Reliability and validity test

4.2.1 Testing for normally distributed error for RCA and RSCA

To test normal distributed errors, the researcher use Jarque-Bera test for normality, which is conducted using Eviews 9.0. The hypothesis of Jarque-Bera is as follows:

H_0: Data are normally distributed

H_1: Data are not normally distributed

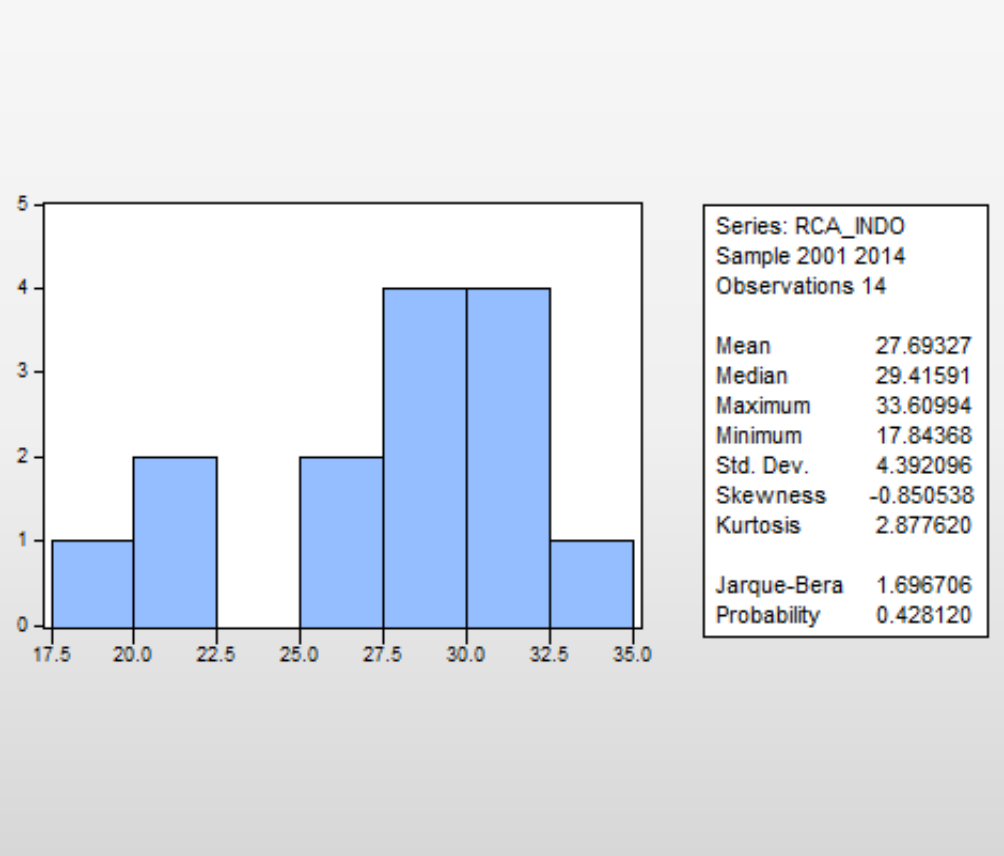
The decision to reject or accept H_0 is as follows:

If JB value > critical value or chi-squares table, then H_0 is rejected

If JB value < critical value or chi-squares table, then H_0 is accepted

A. Normality test result for Indonesia's RCA

Figure 4.3 Normality Test Result for Indonesia's RCA

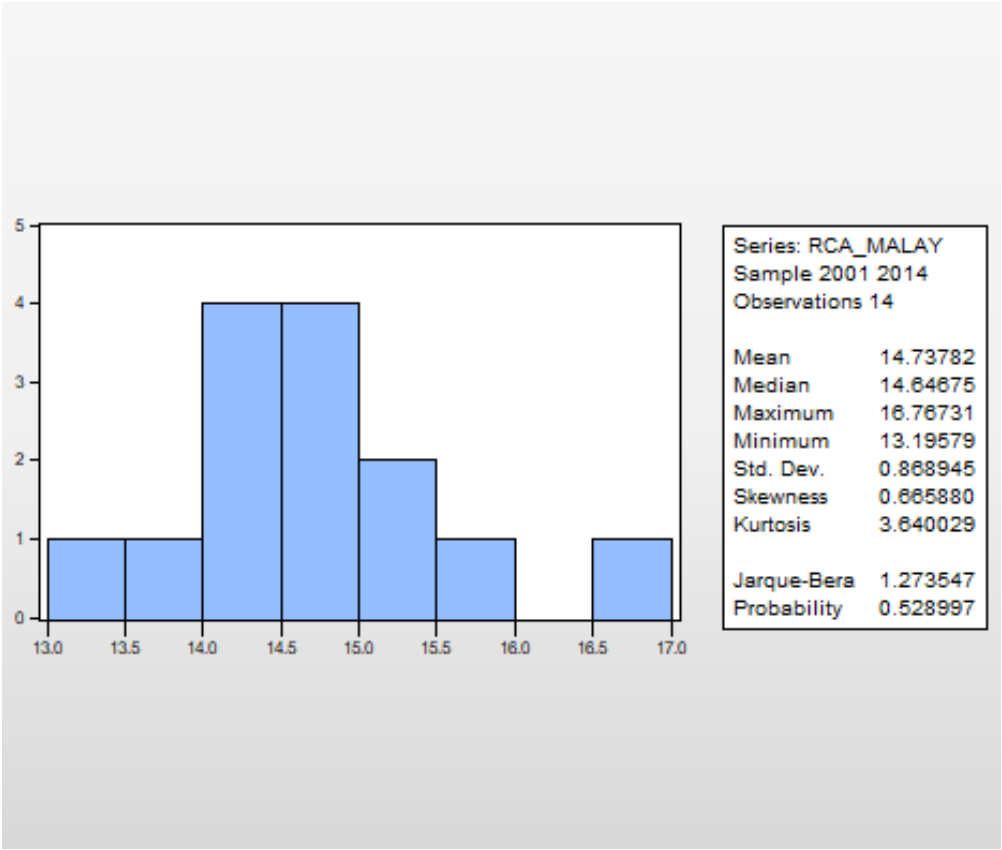


Source: Author's calculation conducted using Eviews 9.0 (Appendix E: Figure E1)

Based on Figure 4.3, to determine whether the assumption of normal distributed errors is satisfied or not, turn the attention to the test statistic and p-value. JB value is 1.696706 while the critical value with 2 degree of freedom and significance level is 5%, then chi-square value is 5.99146. Since, JB value is less than critical value (1.696706 < 5.99146) and p-value = 0.428120 > α = 5% (0.05) then the decision is to accept null hypothesis. It highlights the conclusion that the data do not suffer from non-normality risk. The data are distributed normally.

B. Normality test result for Malaysia's RCA

Figure 4.4 Normality Test Result for Malaysia's RCA

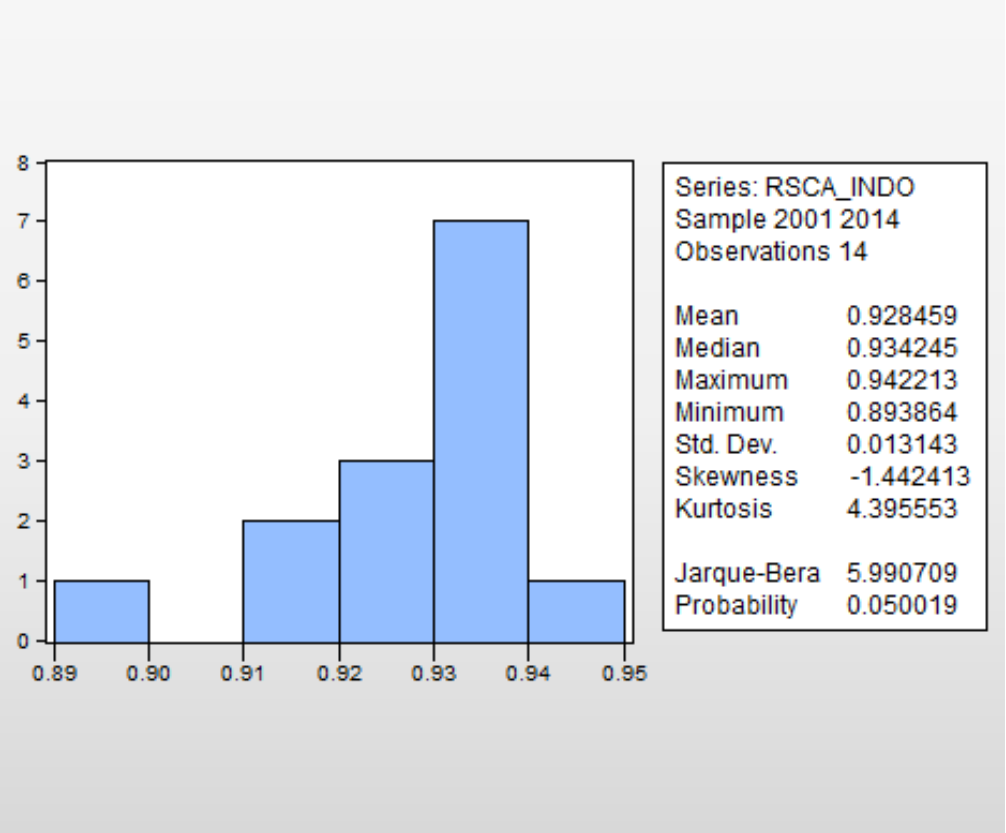


Source: Author's calculation conducted using Eviews 9.0 (Appendix E: Figure E2)

Based on Figure 4.4, to determine whether the assumption of normal distributed errors is satisfied or not, turn the attention to the test statistic and p-value. JB value is 1.273547 while the critical value with 2 degree of freedom and significance level is 5%, then chi-square value is 5.99146. Since, JB value is less than critical value (1.273547 < 5.99146) and p-value = 0.528997 > α = 5% (0.05) then the decision is to accept null hypothesis. It highlights the conclusion that the data do not suffer from non-normality risk. The data are distributed normally.

C. Normality test result for Indonesia's RSCA

Figure 4.5 Normality Test Result for Indonesia's RSCA

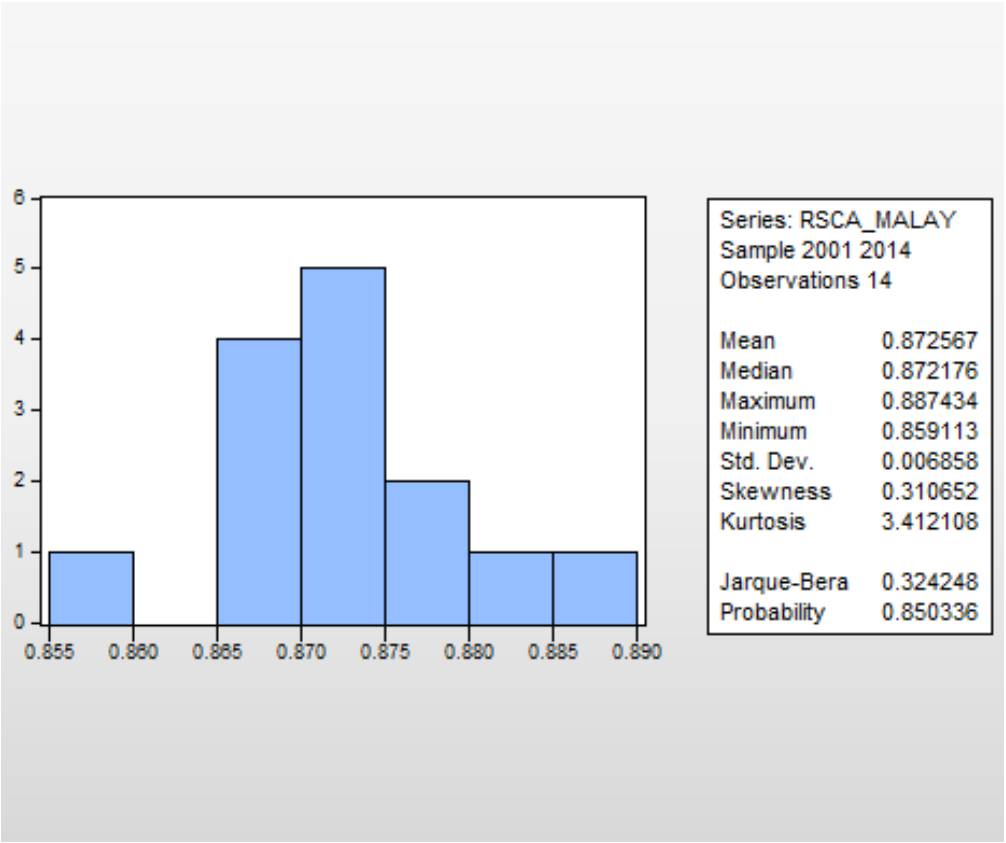


Source: Author's calculation conducted using Eviews 9.0 (Appendix E: Figure E3)

Based on Figure 4.5, to determine whether the assumption of normal distributed errors is satisfied or not, turn the attention to the test statistic and p-value. JB value is 5.990709 while the critical value with 2 degree of freedom and significance level is 5%, then chi-square value is 5.99146. Since, JB value is less than critical value (5.990709 < 5.99146) and p-value = 0.050019 > α = 5% (0.05) then the decision is to accept null hypothesis. It highlights the conclusion that the data do not suffer from non-normality risk. The data are distributed normally.

D. Normality test result for Malaysia's RSCA

Figure 4.6 Normality Test Result for Malaysia's RSCA



Source: Author's calculation conducted using Eviews 9.0 (Appendix E: Figure E4)

Based on Figure 4.6, to determine whether the assumption of normal distributed errors is satisfied or not, turn the attention to the test statistic and p-value. JB value is 0.324248 while the critical value with 2 degree of freedom and significance level is 5%, then chi-square value is 5.99146. Since, JB value is less than critical value (0.324248 < 5.99146) and p-value = 0.850336 > α = 5% (0.05) then the decision is to accept null hypothesis. It highlights the conclusion that the data do not suffer from non-normality risk. The data are distributed normally.

4.2.2 Sample Paired T-test

Sample paired T-test use the degree of freedom n-1, where n is a number of samples. The hypotheses used in sample paired T-test are as follows:

H_0: $\mu_{Indonesia} \leq \mu_{Malaysia}$

H_1: $\mu_{Indonesia} > \mu_{Malaysia}$

The decision to reject or accept H_0 is as follow:

If t value > t critical or t table. Then, reject H_0

If t value < t critical or t table. Then, accept H_0

1. **Sample Paired T-test Result for RCA**

Table 4.2 The Result of Sample Paired T-test for RCA

Hypothesis Testing for DIFFERENCE
Date: 05/21/17 Time: 03:37
Sample: 2001 2014
Included observations: 14
Test of Hypothesis: Mean = 0.000000

Sample Mean = 12.95546
Sample Std. Dev. = 4.913261

Method	Value	Probability
t-statistic	9.866131	0.0000

Source: Author's calculation conducted using Eviews 9.0 (Appendix F: Table F1)

The attention of the issue is to test the hypothesis if there is a difference between Indonesia's RCA and Malaysia's RCA. Based on Table 4.2, T value is 9.866131, with 13 degree of freedom and alpha is 5%. Then, the critical value from T table is 2.160. Since t value is more than T table (9.866131 > 2.160) and the p-value is less than 0.05 (95% confidence level), the decision is to reject the null

hypothesis. It means that Indonesia's RCA is higher than Malaysia's RCA. It highlights the fact that Indonesian palm oil is significantly more competitive than Malaysia.

2. Sample Paired T-test Result for RSCA

Table 4.3 The Result of Sample Paired T-test for RSCA

Hypothesis Testing for DIFFERENCE
Date: 05/22/17 Time: 13:56
Sample: 2001 2014
Included observations: 14
Test of Hypothesis: Mean = 0.000000

Sample Mean = 0.055891
Sample Std. Dev. = 0.017458

Method	Value	Probability
t-statistic	11.97894	0.0000

Source: Author's calculation conducted using Eviews 9.0 (Appendix F: Table F2)

The attention of the issue is to test the hypothesis if there is a difference between Indonesia's RSCA and Malaysia's RSCA. Based on Table 4.3, T value is 11.97894, with 13 degree of freedom and alpha is 5%. Then, the critical value from T table is 2.160. Since t value is more than T table (11.97894 > 2.160) and the p-value is less than 0.05 (95% confidence level) the decision is to reject the null hypothesis. It means that Indonesia's RCA is higher than Malaysia's RCA. It highlights the fact that Indonesian palm oil is significantly more competitive than Malaysia.

CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study aims to measure the competitiveness of palm oil commodity export between Indonesia and Malaysia from the year 2001 to the year 2014 in five major palm oil importing countries. The researcher's findings based on RCA and RSCA result show the following conclusions:

1. RCA and RSCA indices for palm oil commodity (1511) in both countries are positive for the period that study was carried out.
2. Indonesia has higher competitiveness over Malaysia during the analytical period for palm oil commodity (1511).

Based on CMS result:

1. Indonesia's export performance was found to be better than Malaysia in five major palm oil importing countries. Because the demand for Indonesia's' palm oil to the destination market is growing relatively fast while Malaysia's is growing relatively slow than the world.
2. In term of gain competitiveness, price factor is the cause Malaysia lost its competitiveness against Indonesia in five major palm oil importing countries.

5.2 Research Limitation

This research has limitations on commodity analyzed and the methods being used to measure competitiveness. The number of commodities covered in this study

is limited to only one commodity, which is commodity 1511 (palm oil and its fractions, whether or not refined, but not chemically modified). The method used to measure competitiveness are Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA) and Constant Market Share (CMS) Analysis.

5.3 Recommendations

1. More palm oil commodities should be analyzed in the future research to make the specific explanation of competitiveness in different palm oil commodities.
2. The scope area of the study should be broadened not only in five major palm oil importing countries (China, Netherlands, Pakistan, India and Singapore) but also in other regions that have market potential for palm oil commodity.
3. Indonesia should strengthen research and development (R&D) of palm oil commodity by allocating more budget or fund and investment in research and development. In relation to this, government need to cooperate with private palm oil companies and research institutions (university, research center, etc) in order to increase palm oil production that will increase competitiveness.
4. Government need to improve the promotion strategy management and advocacy in confronting black campaign toward Indonesian palm oil.
5. Government should have strong regulation to use degraded land to reduce the destruction of biodiversity. Indonesia can protect its biodiversity by stopping the conversion of natural forest into palm oil.

6. The government should diversify palm oil product by processing palm oil up to downstream sector.

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Appendix A

Table A1: Indonesia's Palm Oil (1511) Exports and All HS Commodities to Five Major Importing Countries

Indonesia's Palm Oil (1511) & All HS Commodities Exports to 5 Major Importing Counries							
Year	Partner	Palm oil Exp. (US$)	Total All Com. Exp. (US$)	Year	Partner	Palm oil Exp. (US$)	Total All Com. Exp. (US$)
2001	China	81,918,022	2,200,670,391	2008	China	1,519,259,945	11,636,503,721
2001	Netherlands	150,374,340	1,498,204,795	2008	Netherlands	1,054,400,030	3,926,404,315
2001	Pakistan	25,659,077	178,633,959	2008	Pakistan	387,727,119	929,645,617
2001	India	328,137,178	1,053,939,504	2008	India	4,109,139,527	7,163,336,232
2001	Singapore	69,855,041	5,363,830,754	2008	Singapore	488,511,030	12,862,045,173
	TOTAL	655,943,658	10,295,279,403		**TOTAL**	7,559,037,651	36,517,935,058
2002	China	170,275,508	2,902,947,738	2009	China	1,628,647,887	11,499,327,261
2002	Netherlands	310,310,819	1,618,370,376	2009	Netherlands	811,943,191	2,909,074,571
2002	Pakistan	88,782,839	264,891,746	2009	Pakistan	139,937,535	665,285,274
2002	India	585,153,152	1,301,960,198	2009	India	3,339,966,994	7,432,892,524
2002	Singapore	116,847,635	5,349,083,695	2009	Singapore	392,601,751	10,262,665,108
	TOTAL	1,271,369,953	11,437,253,753		**TOTAL**	6,313,097,358	32,769,244,738
2003	China	318,343,010	3,802,530,088	2010	China	1,866,512,888	15,692,611,103
2003	Netherlands	205,323,903	1,401,474,395	2010	Netherlands	1,005,517,508	3,722,455,122
2003	Pakistan	116,502,467	265,383,361	2010	Pakistan	81,160,334	688,187,092
2003	India	861,759,138	1,742,487,661	2010	India	4,340,214,667	9,915,038,943
2003	Singapore	125,750,041	5,399,657,659	2010	Singapore	565,576,780	13,723,265,578
	TOTAL	1,627,678,559	12,611,533,164		**TOTAL**	7,858,982,177	43,741,557,838
2004	China	463,310,826	4,604,733,108	2011	China	2,109,518,062	22,941,004,929
2004	Netherlands	307,688,500	1,797,521,202	2011	Netherlands	870,894,292	5,132,476,545
2004	Pakistan	208,064,397	415,895,941	2011	Pakistan	296,845,737	936,013,728
2004	India	1,093,515,452	2,170,506,761	2011	India	5,256,448,792	13,335,706,464
2004	Singapore	152,337,593	5,999,058,039	2011	Singapore	782,521,495	18,443,890,221
	TOTAL	2,224,916,768	14,987,715,051		**TOTAL**	9,316,228,378	60,789,091,887
2005	China	493,391,982	6,662,353,805	2012	China	2,599,992,903	21,659,502,652
2005	Netherlands	383,884,951	2,233,540,708	2012	Netherlands	1,249,802,673	4,664,300,841
2005	Pakistan	319,889,049	634,219,989	2012	Pakistan	714,273,795	1,381,754,474
2005	India	901,287,836	2,878,347,700	2012	India	4,838,414,054	12,496,314,269
2005	Singapore	165,332,999	7,836,584,739	2012	Singapore	905,281,104	17,135,025,448
	TOTAL	2,263,786,817	20,245,046,941		**TOTAL**	10,307,764,529	57,336,897,684
2006	China	707,459,239	8,343,571,337	2013	China	1,794,127,110	22,601,487,232
2006	Netherlands	468,795,883	2,518,358,053	2013	Netherlands	1,031,041,268	4,105,967,064
2006	Pakistan	337,024,938	734,099,576	2013	Pakistan	814,449,695	1,415,437,768
2006	India	972,560,867	3,390,790,230	2013	India	4,281,590,453	13,031,302,738
2006	Singapore	245,439,530	8,929,849,215	2013	Singapore	650,146,583	16,686,238,643
	TOTAL	2,731,280,457	23,916,668,411		**TOTAL**	8,571,355,109	57,840,433,445
2007	China	957,156,782	9,675,512,723	2014	China	1,789,785,816	17,605,944,452
2007	Netherlands	544,619,318	2,749,459,376	2014	Netherlands	908,504,397	3,984,581,541
2007	Pakistan	543,710,474	935,012,405	2014	Pakistan	1,353,944,511	2,045,294,361
2007	India	2,180,345,044	4,943,905,977	2014	India	3,635,344,651	12,248,959,579
2007	Singapore	406,364,433	10,501,617,246	2014	Singapore	602,913,506	16,752,339,986
	TOTAL	4,632,196,051	28,805,507,727		**TOTAL**	8,290,492,881	52,637,119,919

Table A2: Malaysia's Palm Oil (1511) Exports and All HS Commodities to Five Major Importing Countries

Malaysia's Palm Oil (1511) & All HS Commodities Exports to 5 Major Importing Counries							
Year	Partner	Palm oil Exp. (US$)	Total All Com. Exp. (US$)	Year	Partner	Palm oil Exp. (US$)	Total All Com. Exp. (US$)
2001	China	325,347,463	3,821,010,266	2008	China	3,219,506,940	19,012,611,886
2001	Netherlands	173,755,804	4,060,341,708	2008	Netherlands	922,413,984	7,025,132,969
2001	Pakistan	266,287,329	399,268,105	2008	Pakistan	1,151,596,947	1,718,620,164
2001	India	468,637,432	1,577,051,266	2008	India	567,479,075	7,411,517,603
2001	Singapore	100,486,025	14,913,010,023	2008	Singapore	380,499,007	29,064,212,702
	TOTAL	1,334,514,053	24,770,681,368		**TOTAL**	6,241,495,953	64,232,095,324
2002	China	607,346,971	5,265,191,003	2009	China	2,316,717,854	19,103,882,149
2002	Netherlands	214,467,212	3,456,910,444	2009	Netherlands	632,401,970	5,233,491,198
2002	Pakistan	368,791,411	525,090,136	2009	Pakistan	1,139,002,898	1,632,818,269
2002	India	559,067,860	1,765,110,191	2009	India	694,759,604	4,829,344,247
2002	Singapore	148,145,898	15,929,232,226	2009	Singapore	244,388,276	21,931,898,495
	TOTAL	1,897,819,352	26,941,534,000		**TOTAL**	5,027,270,602	52,731,434,358
2003	China	801,717,778	6,787,229,749	2010	China	2,268,914,193	25,057,168,797
2003	Netherlands	312,798,314	3,423,766,562	2010	Netherlands	723,637,505	6,286,028,046
2003	Pakistan	443,651,808	667,727,533	2010	Pakistan	1,809,005,963	2,336,544,945
2003	India	638,275,187	2,537,427,055	2010	India	823,533,033	6,516,310,689
2003	Singapore	187,698,928	16,444,449,323	2010	Singapore	383,096,818	26,552,829,603
	TOTAL	2,384,142,015	29,860,600,222		**TOTAL**	6,008,187,512	66,748,882,080
2004	China	929,356,446	8,496,380,594	2011	China	3,572,870,602	29,821,382,323
2004	Netherlands	396,268,791	4,152,351,047	2011	Netherlands	1,174,682,536	6,307,106,967
2004	Pakistan	379,621,277	702,293,222	2011	Pakistan	1,988,863,444	2,555,498,436
2004	India	363,751,537	3,014,994,826	2011	India	1,638,078,740	9,209,461,687
2004	Singapore	182,040,169	18,931,037,132	2011	Singapore	453,080,450	28,812,576,549
	TOTAL	2,251,038,220	35,297,056,821		**TOTAL**	8,827,575,772	76,706,025,962
2005	China	816,229,563	9,284,400,095	2012	China	2,685,200,184	28,742,900,356
2005	Netherlands	422,031,610	4,730,958,301	2012	Netherlands	1,300,296,666	6,007,455,520
2005	Pakistan	345,750,718	747,908,348	2012	Pakistan	1,298,750,413	1,855,856,488
2005	India	158,829,966	3,997,779,998	2012	India	2,364,524,265	9,492,710,234
2005	Singapore	144,783,730	22,078,782,553	2012	Singapore	491,562,366	30,931,145,663
	TOTAL	1,887,625,587	40,839,829,295		**TOTAL**	8,140,333,894	77,030,068,261
2006	China	1,269,221,224	11,638,253,320	2013	China	2,190,260,305	30,775,462,371
2006	Netherlands	577,273,963	5,846,114,846	2013	Netherlands	1,022,355,393	6,569,679,845
2006	Pakistan	376,359,187	842,597,929	2013	Pakistan	1,074,018,001	1,653,628,452
2006	India	146,167,343	5,124,277,668	2013	India	1,681,801,831	8,161,429,153
2006	Singapore	178,711,933	24,757,812,004	2013	Singapore	317,025,473	31,778,865,871
	TOTAL	2,547,733,650	48,209,055,767		**TOTAL**	6,285,461,003	78,939,065,692
2007	China	2,293,516,769	15,443,850,730	2014	China	1,676,783,699	28,222,682,560
2007	Netherlands	797,121,949	6,867,039,331	2014	Netherlands	1,057,122,624	7,162,913,020
2007	Pakistan	723,029,686	1,255,058,737	2014	Pakistan	603,734,736	1,215,675,315
2007	India	211,341,752	5,881,466,613	2014	India	2,271,717,262	9,748,022,284
2007	Singapore	271,501,494	25,590,474,681	2014	Singapore	298,284,485	33,262,665,974
	TOTAL	4,296,511,650	55,037,890,092		**TOTAL**	5,907,642,806	79,611,959,153

Appendix B

Table B1: World export Palm Oil (1511) and All HS Commodities to Five Major Importing Countries

World Export Palm Oil (1511) & All HS Commodities to 5 Major Importing Countries							
Year	Partner	Palm oil Exp. (US$)	Total All Com. Exp. (US$)	Year	Partner	Palm oil Exp. (US$)	Total All Com. Exp. (US$)
2001	China	434,181,395	213,669,874,078	2008	China	4,808,056,275	906,672,283,973
2001	Netherlands	350,050,727	214,616,293,626	2008	Netherlands	2,088,885,134	604,639,060,142
2001	Pakistan	292,436,293	7,275,129,816	2008	Pakistan	1,540,210,022	29,619,510,232
2001	India	802,836,690	39,123,114,099	2008	India	4,774,512,954	230,772,971,278
2001	Singapore	180,107,468	102,137,299,056	2008	Singapore	869,365,906	250,600,682,493
	TOTAL	2,059,612,573	576,821,710,675		**TOTAL**	14,081,030,291	2,022,304,508,118
2002	China	808,493,246	260,624,101,731	2009	China	3,968,355,075	867,592,886,549
2002	Netherlands	538,303,655	225,717,643,539	2009	Netherlands	1,510,488,159	453,431,935,683
2002	Pakistan	457,740,571	8,879,376,063	2009	Pakistan	1,287,795,661	25,342,010,558
2002	India	1,144,916,184	44,856,883,017	2009	India	4,061,413,121	205,999,812,405
2002	Singapore	265,093,829	104,334,548,410	2009	Singapore	637,292,617	202,340,947,694
	TOTAL	3,214,547,485	644,412,552,760		**TOTAL**	11,465,344,633	1,754,707,592,889
2003	China	1,149,466,152	359,918,148,113	2010	China	4,164,073,189	1,183,660,219,335
2003	Netherlands	532,866,463	268,527,387,460	2010	Netherlands	1,787,242,012	540,202,603,880
2003	Pakistan	560,687,916	11,272,129,128	2010	Pakistan	1,894,602,598	30,317,889,600
2003	India	1,512,938,252	57,237,639,356	2010	India	5,187,982,091	278,711,071,477
2003	Singapore	315,772,464	112,580,341,517	2010	Singapore	949,395,544	251,160,027,752
	TOTAL	4,071,731,247	809,535,645,574		**TOTAL**	13,983,295,434	2,284,051,812,044
2004	China	1,422,704,803	472,185,714,515	2011	China	5,708,878,071	1,426,480,533,776
2004	Netherlands	732,564,185	324,824,160,185	2011	Netherlands	2,429,992,956	632,276,243,861
2004	Pakistan	587,891,552	16,351,012,787	2011	Pakistan	2,288,744,518	33,440,579,258
2004	India	1,461,059,111	76,067,744,506	2011	India	6,946,171,935	337,293,284,188
2004	Singapore	334,516,195	138,171,784,535	2011	Singapore	1,339,358,821	296,964,227,503
	TOTAL	4,538,735,846	1,027,600,416,528		**TOTAL**	18,713,146,301	2,726,454,868,586
2005	China	1,322,808,557	555,284,017,073	2012	China	5,317,963,907	1,439,757,534,881
2005	Netherlands	847,150,509	370,021,745,060	2012	Netherlands	3,117,309,703	633,858,260,598
2005	Pakistan	665,768,438	20,145,986,440	2012	Pakistan	2,016,086,509	33,532,580,084
2005	India	1,072,247,218	99,266,935,314	2012	India	7,226,077,259	354,324,857,069
2005	Singapore	310,511,154	159,651,474,118	2012	Singapore	1,401,434,103	306,340,746,842
	TOTAL	4,218,485,876	1,204,370,158,005		**TOTAL**	19,078,871,481	2,767,813,979,474
2006	China	2,000,669,721	669,104,826,934	2013	China	4,007,599,125	1,542,454,928,668
2006	Netherlands	1,066,776,677	436,140,166,077	2013	Netherlands	2,389,076,443	636,811,622,505
2006	Pakistan	713,794,456	23,952,190,458	2013	Pakistan	1,889,140,550	35,963,908,271
2006	India	1,179,217,292	130,936,541,108	2013	India	6,136,690,158	329,649,900,859
2006	Singapore	425,230,913	187,698,865,284	2013	Singapore	970,096,738	313,008,024,812
	TOTAL	5,385,689,059	1,447,832,589,861		**TOTAL**	15,392,603,014	2,857,888,385,115
2007	China	3,285,701,555	807,139,326,220	2014	China	3,484,363,847	1,527,767,997,785
2007	Netherlands	1,424,021,153	509,777,114,759	2014	Netherlands	2,367,537,954	632,376,376,582
2007	Pakistan	1,268,120,969	26,448,486,109	2014	Pakistan	1,958,396,040	39,562,012,772
2007	India	2,446,732,472	181,740,730,288	2014	India	6,014,970,047	332,597,498,452
2007	Singapore	678,311,977	213,011,739,771	2014	Singapore	903,074,210	319,340,121,273
	TOTAL	9,102,888,126	1,738,117,397,147		**TOTAL**	14,728,342,098	2,851,644,006,864

Table B2: World Export Palm Oil Commodity 1511 to Five Major Importing Countries Exclude Indonesia and Malaysia

World Palm Oil Commodity (1511) Export to 5 Major Importing Countries without Indonesia				World Palm Oil Commodity (1511) Export to 5 Major Importing Countries without Malaysia			
Year	Partner	World to 5	Indo to 5	Year	Partner	World to 5	Malay to 5
2001	China	434,181,395	81,918,022	2001	China	434,181,395	325,347,463
2001	Netherlands	350,050,727	150,374,340	2001	Netherlands	350,050,727	173,755,804
2001	Pakistan	292,436,293	25,659,077	2001	Pakistan	292,436,293	266,287,329
2001	India	802,836,690	328,137,178	2001	India	802,836,690	468,637,432
2001	Singapore	180,107,468	69,855,041	2001	Singapore	180,107,468	100,486,025
			352,263,373				108,833,932
			199,676,387				176,294,923
		Total without Indonesia →	266,777,216			**Total without Malaysia** →	26,148,964
			474,699,512				334,199,258
			110,252,427				79,621,443
Year	Partner	World to 5	Indo to 5	Year	Partner	World to 5	Malay to 5
2014	China	3,484,363,847	1,789,785,816	2014	China	3,484,363,847	1,676,783,699
2014	Netherlands	2,367,537,954	908,504,397	2014	Netherlands	2,367,537,954	1,057,122,624
2014	Pakistan	1,958,396,040	1,353,944,511	2014	Pakistan	1,958,396,040	603,734,736
2014	India	6,014,970,047	3,635,344,651	2014	India	6,014,970,047	2,271,717,262
2014	Singapore	903,074,210	602,913,506	2014	Singapore	903,074,210	298,284,485
			1,694,578,031				1,807,580,148
			1,459,033,557				1,310,415,330
		Total without Indonesia →	604,451,529			**Total without Malaysia** →	1,354,661,304
			2,379,625,396				3,743,252,785
			300,160,704				604,789,725

Appendix C

Table C1: The Estimated Result of RCA and RSCA for Indonesia and Malaysia

Competitiveness of Indonesian Palm Oil (1511) Exports among 5 major importing countries						
	Indonesia to 5 Major Countries		All to 5 Major Countries		RCA_{ad}	$RSCA_{ad}$
	X_{ad}	X_a	X_{wd}	Xw		
Year	The export of palm oil (US$)	Total All Commodities Exports (US$)	The total exports of palm oil (US$)	Total All Commodities Exports (US$)	$\frac{(Xad/X_a)}{(Xwd/X_w)}$	$\frac{RCA-1}{RCA+1}$
2001	655,943,658	10,295,279,403	2,059,612,573	576,821,710,675	17.84	0.8939
2002	1,271,369,953	11,437,253,753	3,214,547,485	644,412,552,760	22.28	0.9141
2003	1,627,678,559	12,611,533,164	4,071,731,247	809,535,645,574	25.66	0.9250
2004	2,224,916,768	14,987,715,051	4,538,735,846	1,027,600,416,528	33.61	0.9422
2005	2,263,786,817	20,245,046,941	4,218,485,876	1,204,370,158,005	31.92	0.9393
2006	2,731,280,457	23,916,668,411	5,385,689,059	1,447,832,589,861	30.70	0.9369
2007	4,632,196,051	28,805,507,727	9,102,888,126	1,738,117,397,147	30.71	0.9369
2008	7,559,037,651	36,517,935,058	14,081,030,291	2,022,304,508,118	29.73	0.9349
2009	6,313,097,358	32,769,244,738	11,465,344,633	1,754,707,592,889	29.48	0.9344
2010	7,858,982,177	43,741,557,838	13,983,295,434	2,284,051,812,044	29.35	0.9341
2011	9,316,228,378	60,789,091,887	18,713,146,301	2,726,454,868,586	22.33	0.9143
2012	10,307,764,529	57,336,897,684	19,078,871,481	2,767,813,979,474	26.08	0.9261
2013	8,571,355,109	57,840,433,445	15,392,603,014	2,857,888,385,115	27.51	0.9299
2014	8,290,492,881	52,637,119,919	14,728,342,098	2,851,644,006,864	30.50	0.9365

Competitiveness of Malaysian Palm Oil (1511) Exports among 5 major importing countries						
	Malaysia to 5 Major Countries		All to 5 Major Countries		RCA_{ad}	$RSCA_{ad}$
	X_{ad}	X_a	X_{wd}	Xw		
Year	The export of palm oil (US$)	Total All Commodities Exports (US$)	The total exports of palm oil (US$)	Total All Commodities Exports (US$)	$\frac{(Xad/X_a)}{(Xwd/X_w)}$	$\frac{RCA-1}{RCA+1}$
2001	1,334,514,053	24,770,681,368	2,059,612,573	576,821,710,675	15.09	0.8757
2002	1,897,819,352	26,941,534,000	3,214,547,485	644,412,552,760	14.12	0.8677
2003	2,384,142,015	29,860,600,222	4,071,731,247	809,535,645,574	15.87	0.8815
2004	2,251,038,220	35,297,056,821	4,538,735,846	1,027,600,416,528	14.44	0.8705
2005	1,887,625,587	40,839,829,295	4,218,485,876	1,204,370,158,005	13.20	0.8591
2006	2,547,733,650	48,209,055,767	5,385,689,059	1,447,832,589,861	14.21	0.8685
2007	4,296,511,650	55,037,890,092	9,102,888,126	1,738,117,397,147	14.91	0.8743
2008	6,241,495,953	64,232,095,324	14,081,030,291	2,022,304,508,118	13.96	0.8663
2009	5,027,270,602	52,731,434,358	11,465,344,633	1,754,707,592,889	14.59	0.8717
2010	6,008,187,512	66,748,882,080	13,983,295,434	2,284,051,812,044	14.70	0.8726
2011	8,827,575,772	76,706,025,962	18,713,146,301	2,726,454,868,586	16.77	0.8874
2012	8,140,333,894	77,030,068,261	19,078,871,481	2,767,813,979,474	15.33	0.8775
2013	6,285,461,003	78,939,065,692	15,392,603,014	2,857,888,385,115	14.78	0.8733
2014	5,907,642,806	79,611,959,153	14,728,342,098	2,851,644,006,864	14.37	0.8699

Appendix D

Table D1: Calculation of Constant Market Share of Palm Oil Commodity (1511) for Indonesia and Malaysia

Actual Worlds Exports (Ex. indo) 2001		
Commodity / Market	HS 1511	Total
China	352,263,373	**352,263,373**
Netherland	199,676,387	**199,676,387**
Pakistan	266,777,216	**266,777,216**
India	474,699,512	**474,699,512**
Singapore	110,252,427	**110,252,427**

Actual Worlds Exports (Ex. indo) 2014		
Commodity / Market	HS 1511	Total
China	1,694,578,031	**1,694,578,031**
Netherland	1,459,033,557	**1,459,033,557**
Pakistan	604,451,529	**604,451,529**
India	2,379,625,396	**2,379,625,396**
Singapore	300,160,704	**300,160,704**

Growth of Actual Worlds Exports (rij)	
Commodity / Market	HS 1511
China	3.81
Netherland	6.31
Pakistan	1.27
India	4.01
Singapore	1.72

rij X Vij		
Commodity / Market	HS 1511	Total
China	1,342,314,658	**1,342,314,658**
Netherland	1,259,357,170	**1,259,357,170**
Pakistan	337,674,313	**337,674,313**
India	1,904,925,884	**1,904,925,884**
Singapore	189,908,277	**189,908,277**

Actual Worlds Exports (Ex. Malay) 2001		
Commodity / Market	HS 1511	Total
China	108,833,932	**108,833,932**
Netherland	176,294,923	**176,294,923**
Pakistan	26,148,964	**26,148,964**
India	334,199,258	**334,199,258**
Singapore	79,621,443	**79,621,443**

Actual Worlds Exports (Ex. Malay) 2014		
Commodity / Market	HS 1511	Total
China	1,807,580,148	**1,807,580,148**
Netherland	1,310,415,330	**1,310,415,330**
Pakistan	1,354,661,304	**1,354,661,304**
India	3,743,252,785	**3,743,252,785**
Singapore	604,789,725	**604,789,725**

Growth of Actual Worlds Exports (rij)	
Commodity / Market	HS 1511
China	15.61
Netherland	6.43
Pakistan	50.81
India	10.20
Singapore	6.60

rij X Vij		
Commodity / Market	HS 1511	Total
China	1,698,746,216	**1,698,746,216**
Netherland	1,134,120,407	**1,134,120,407**
Pakistan	1,328,512,340	**1,328,512,340**
India	3,409,053,527	**3,409,053,527**
Singapore	525,168,282	**525,168,282**

Table D2: The Estimated Result of Constant Market Share (CMS) Analysis of Indonesian Palm Oil Commodity (1511)

Constant Market Share Analysis of Changes in Indonesian palm oil Exports (HS 1511), 2001-2014 (in US$)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Actual Worlds Exports		Actual Indonesian Export					
	2001	2014	2001	2014	(2) ÷ (1) - 1	(5) × (3)	3.586 × (3)	$(\sum_i r_{ij} V_{ij})$
Market			($V_{.j}$)	($V'_{.j}$)	(r_j)	($r_j V_{.j}$)	($rV_{.j}$)	
1 China	352,263,373	1,694,578,031	81,918,022	1,789,785,816	3.811	312,152,128.53	293,794,418.56	1,342,314,658
2 Netherlands	199,676,387	1,459,033,557	150,374,340	908,504,397	6.307	948,409,604.70	539,309,186.28	1,259,357,170
3 Pakistan	266,777,216	604,451,529	25,659,077	1,353,944,511	1.266	32,478,077.88	92,024,849.04	337,674,313
4 India	474,699,512	2,379,625,396	328,137,178	3,635,344,651	4.013	1,316,784,593.36	1,176,845,693.59	1,904,925,884
5 Singapore	110,252,427	300,160,704	69,855,041	602,913,506	1.722	120,324,339.67	250,531,209.77	189,908,277
Total	1,403,668,915	6,437,849,217	655,943,658	8,290,492,881	3.586	2,730,148,744.14	2,352,505,357.24	5,034,180,302
			$\left(\sum_{i=1}^{1}\sum_{j=1}^{5} V_{ij}\right)$	$\left(\sum_{i=1}^{1}\sum_{j=1}^{5} V'_{ij}\right)$	(r)	$\left(\sum_{j=1}^{5} r_j V_{.j}\right)$	$\left(\sum_{j=1}^{5} rV_{.j}\right)$	$\left(\sum_{i=1}^{1}\sum_{j=1}^{5} r_{ij} V_{ij}\right)$

Analysis

Indonesia Palm oil Exports 2001	655,943,658
Indonesia Palm oil Exports 2014	8,290,492,881
Change in Exports	7,634,549,223

1 Due to increase in world trade:	$\sum_{j=1}^{5} rV_{.j}$	2,352,505,357.24	31%
2 Due to Commodity Composition:	$\sum_{j=1}^{5} r_i V_{.j} - \sum_{j=1}^{5} rV_{.j}$	377,643,386.90	5%
3 Due to market distribution:	$\sum_{i=1}^{1}\sum_{j=1}^{5} r_{ij} V_{ij} - \sum_{j=1}^{5} r_i V_{.j}$	2,304,031,557.86	30%
4 Due to increased competitiveness:	$\sum_{i=1}^{1}\sum_{j=1}^{5} V'_{ij} - \sum_{i=1}^{1}\sum_{j=1}^{5} V_{ij} - \sum_{i=1}^{1}\sum_{j=1}^{5} r_{ij} V_{ij}$	2,600,368,921	34%

Table D3: The Estimated Result of Constant Market Share (CMS) Analysis of Malaysian Palm Oil Commodity (1511)

Constant Market Share Analysis of Changes in Malaysian palm oil Exports (HS 1511), 2001-2014 (in US$)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Actual Worlds Exports		Actual Malaysian Export					
	2001	2014	2001	2014	(2) ÷ (1) - 1	(5) × (3)	11.165 × (3)	$(\sum_i r_{ij}V_{ij})$
Market			($V_{.j}$)	($V'_{.j}$)	(r_i)	($r_iV_{.j}$)	($rV_{.j}$)	
1 China	108,833,932	1,807,580,148	325,347,463	1,676,783,699	15.609	5,078,221,116.34	3,632,448,694.88	1,698,746,216
2 Netherlands	176,294,923	1,310,415,330	173,755,804	1,057,122,624	6.433	1,117,786,036.02	1,939,953,788.63	1,134,120,407
3 Pakistan	26,148,964	1,354,661,304	266,287,329	603,734,736	50.806	13,528,872,599.39	2,973,052,415.31	1,328,512,340
4 India	334,199,258	3,743,252,785	468,637,432	2,271,717,262	10.201	4,780,411,841.74	5,232,256,654.29	3,409,053,527
5 Singapore	79,621,443	604,789,725	100,486,025	298,284,485	6.596	662,787,198.10	1,121,909,256.64	525,168,282
Total	725,098,520	8,820,699,292	1,334,514,053	5,907,642,806	11.165	25,168,078,791.59	14,899,620,809.75	8,095,600,772
			$\left(\sum_{i=1}^{1}\sum_{j=1}^{5} V_{ij}\right)$	$\left(\sum_{i=1}^{1}\sum_{j=1}^{5} V'_{ij}\right)$	(r)	$\left(\sum_{j=1}^{5} r_iV_{.j}\right)$	$\left(\sum_{j=1}^{5} rV_{.j}\right)$	$\left(\sum_{i=1}^{1}\sum_{j=1}^{5} r_{ij}V_{ij}\right)$

Analysis

Malaysia Palm oil Exports 2001	1,334,514,053	
Malaysia Palm oil Exports 2014	5,907,642,806	
Change in Exports	4,573,128,753	100%
1 Due to increase in world trade: $\sum_{j=1}^{5} rV_{.j}$	14,899,620,809.75	326%
2 Due to Commodity Composition: $\sum_{j=1}^{5} r_iV_{.j} - \sum_{j=1}^{5} rV_{.j}$	10,268,457,981.84	225%
3 Due to market distribution: $\sum_{i=1}^{1}\sum_{j=1}^{5} r_{ij}V_{ij} - \sum_{j=1}^{5} r_iV_{.j}$	(17,072,478,019.59)	-373%
4 Due to increased competitiveness: $\sum_{i=1}^{1}\sum_{j=1}^{5} V'_{ij} - \sum_{i=1}^{1}\sum_{j=1}^{5} V_{ij} - \sum_{i=1}^{1}\sum_{j=1}^{5} r_{ij}V_{ij}$	(3,522,472,019)	-77%

Appendix E

Figure E1: Normality Test Result for Indonesia's RCA

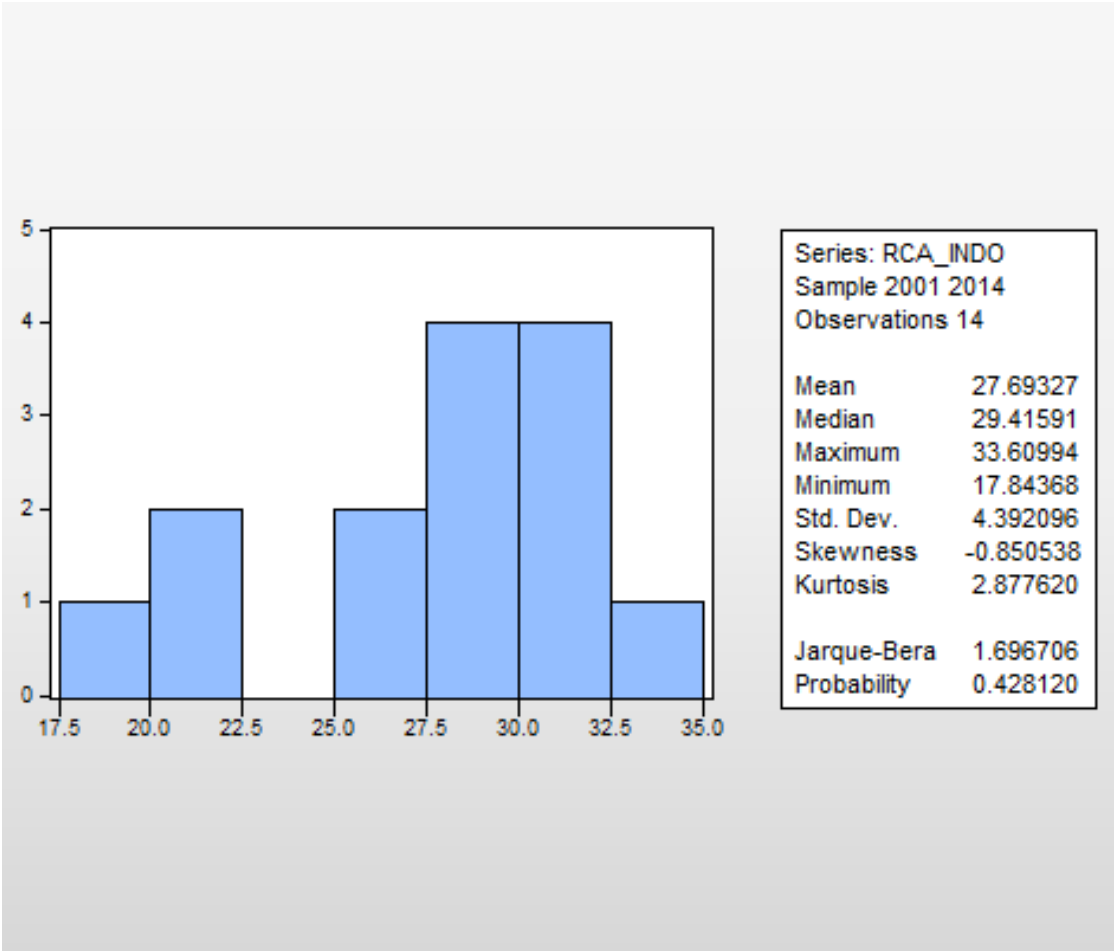


Figure E2: Normality Test Result for Malaysia's RCA

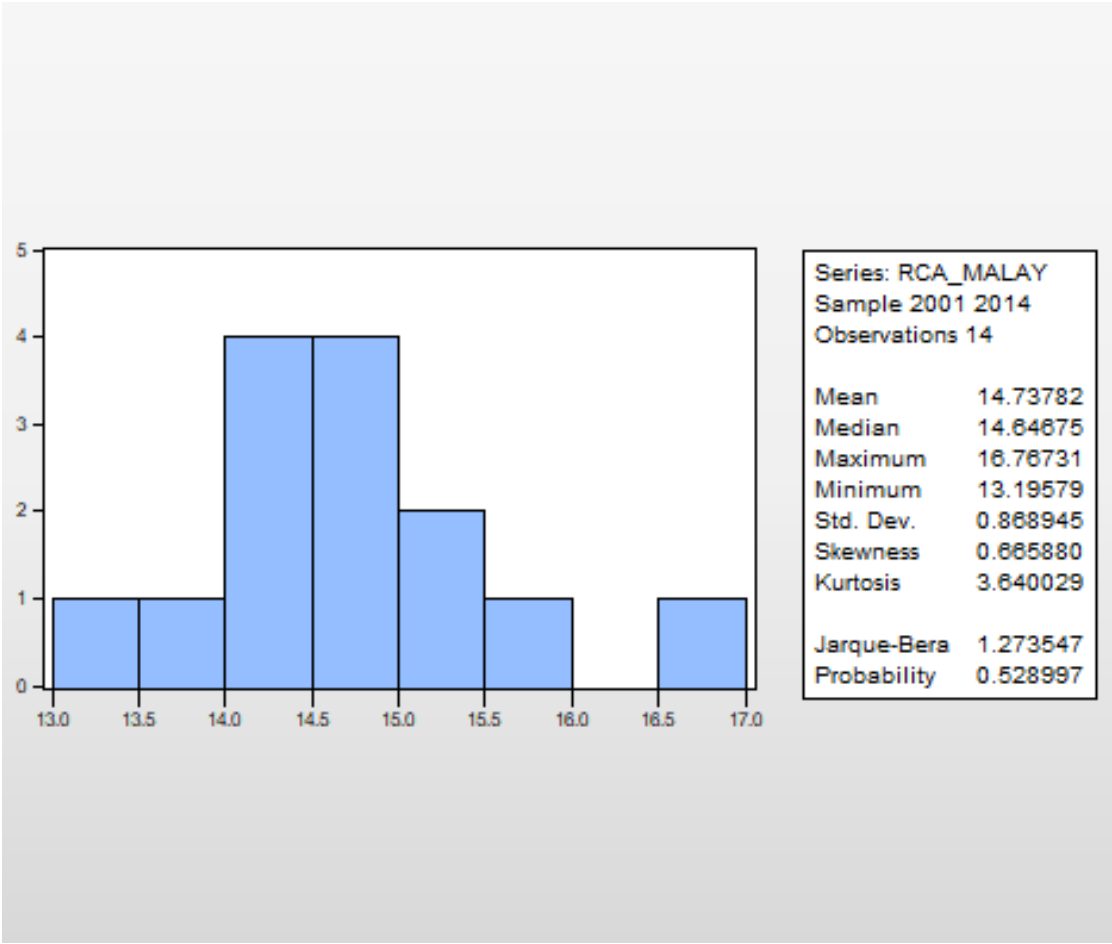


Figure E3: Normality Test Result for Indonesia's RSCA

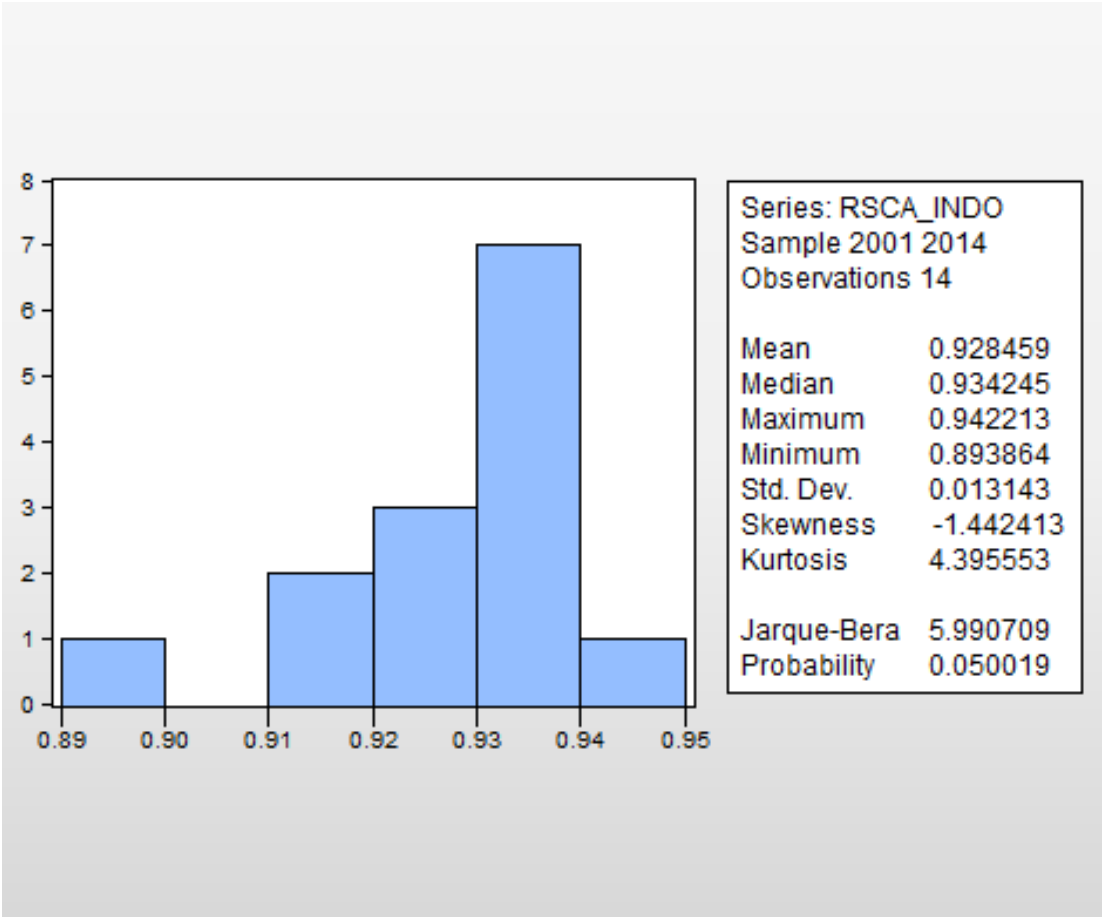
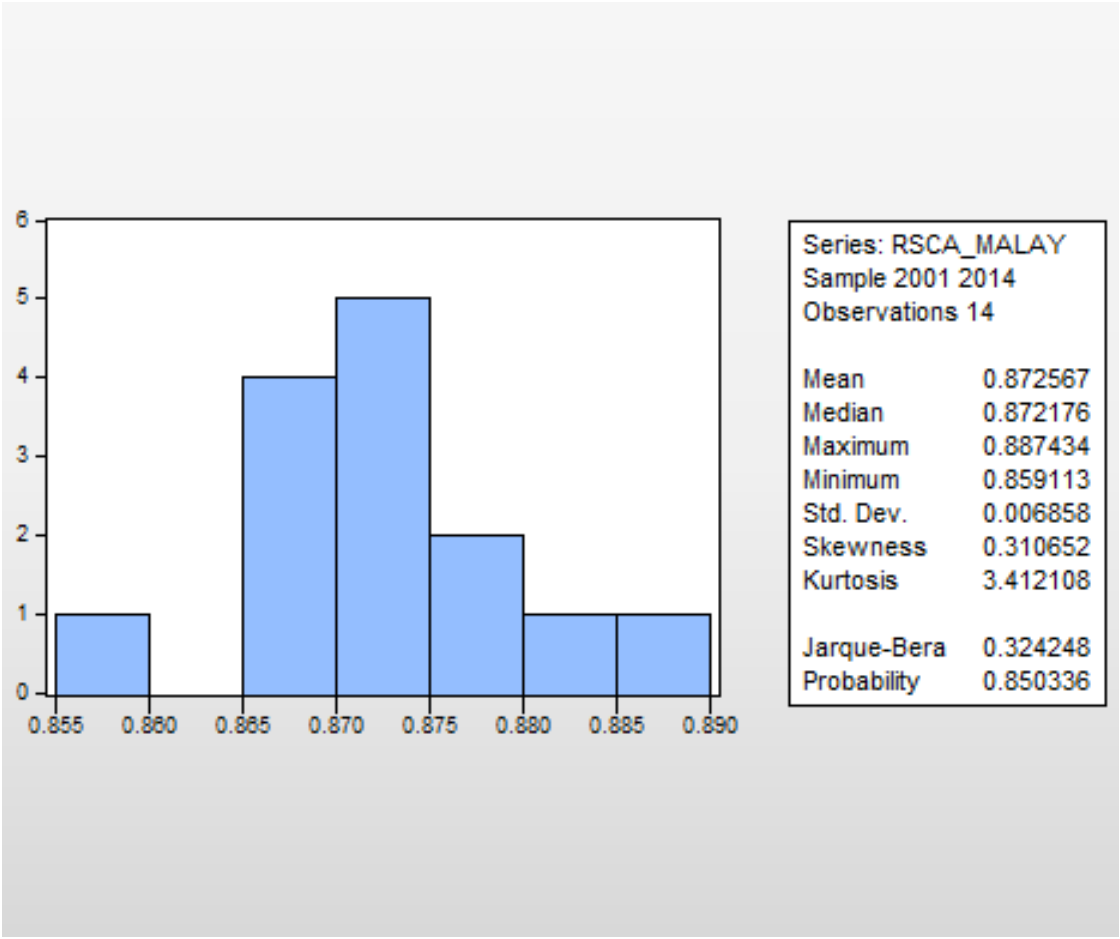


Figure E4: Normality Test Result for Malaysia's RCA



Appendix F

Table F1: Sample Paired T-test Result for RCA

Hypothesis Testing for DIFFERENCE
Date: 05/21/17 Time: 03:37
Sample: 2001 2014
Included observations: 14
Test of Hypothesis: Mean = 0.000000

Sample Mean = 12.95546
Sample Std. Dev. = 4.913261

Method	Value	Probability
t-statistic	9.866131	0.0000

Table F2: Sample Paired T-test Result for RSCA

Hypothesis Testing for DIFFERENCE
Date: 05/22/17 Time: 13:56
Sample: 2001 2014
Included observations: 14
Test of Hypothesis: Mean = 0.000000

Sample Mean = 0.055891
Sample Std. Dev. = 0.017458

Method	Value	Probability
t-statistic	11.97894	0.0000