



Indonesian Clove Competitiveness and Competitor Countries in International Market

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Abstract

Trade liberalization is currently demanding every country to increase the competitiveness of its products. Indonesia as the largest clove producer in the world has a major competitor in the international market. This study aims to determine the competitiveness of Indonesia's clove exports and competing countries in the international market and determine the factors that affect its competitiveness. The data used in this study are secondary data from five major producing countries namely Indonesia, Madagascar, Tanzania, Sri Lanka, and Comoros during the period 2000-2017 sourced from UNComtrade, FAO and the World Bank. Competitiveness is measured by Revealed Comparative Advantage (RCA), Acceleration Ratio (AR) and Export Product Dynamic (EPD) while the factors that affect competitiveness are used panel data regression methods using E-Views software. The results showed that Indonesia had the lowest RCA index, the AR value showed Madagascar and Tanzania were able to capture market share in the international market and the EPD value showed that all countries occupied the rising star position except Sri Lanka in the falling star position. Panel data regression analysis results show that the market share and GDP variables significantly influence the competitiveness of the main clove producing countries while the production variables and export prices do not significantly influence the country's competitiveness. The government must dare to take policies to limit clove imports and increase exports.

INTRODUCTION

International trade is now one of the determinants of a country's economic progress. Import and export activities require each country to increase its competitiveness if it does not want to be left behind from other countries. Each country uses its advantages in terms of natural resources and human resources and seeks to improve export performance to encourage the progress of its economic movement. The better the performance of trade exports, the more will have a positive impact on the country's GDP (Nurhayati et al., 2018).

The current trend of trade liberalization is difficult to avoid especially by developing countries. Some groups define trade liberalization as removing trade barriers in the form of tariffs and non-tariffs that can hamper trade flows between countries (Kingu, 2014).

The development of the free market era today both in the ASEAN region and internationally inevitably requires Indonesia to be able to increase the competitiveness of its superior products (Sari and Widanta, 2018). Indonesia has huge potential to increase the export capacity of various agricultural commodities, especially plantations and on the other hand suppress imports of commodities that can be produced domestically (Ramadhani, 2013).

Clove is one of Indonesia's leading export products that are widely cultivated by farmers in Indonesia, so as to make a real contribution to the Indonesian economy in terms of employment in the on-farm sector and the clove cigarette industry sector through its excise (Kumaat et al., 2015; Ndiba et al., 2016). In order to encourage increased clove production in order to be able to reach its optimal potential in a sustainable manner, innovation and adoption of GAP (Good Agricultural Practices) are needed in order to achieve the objectives of developing clove plantations and improving the living conditions of farmers (Wahyudi, 2016a).

Clove price fluctuation is one of the factors affecting national clove production. On the other hand, clove plants are unique in terms of

production, namely a large harvest every four years followed by a medium harvest and a small harvest. Market performance is related to the risks borne by farmers and industry. The most disadvantaged parties in this condition are the clove farmers where production costs have increased but at the same time, the price of cloves has fallen sharply (Wahyudi, 2016b; Santoso, 2018).

Most of the national clove production is absorbed by the kretek cigarette industry. Clove cigarettes that use clove and tobacco raw materials have a distinctive taste and aroma and are most preferred by cigarette consumers. The largest market for kretek cigarettes is still controlled by Gudang Garam with a market share of 30.3% or equivalent to 64.7 billion sticks (Ratnawati, 2016). Based on data from the Directorate General of Customs and Excise, it was recorded that in 2018 state revenues from cigarette excise tax reached 155 trillion rupiahs, for 2019 the government was targeting revenue from an excise tax of 165 trillion rupiahs.

Clove, besides being used as a raw material for the kretek cigarette industry, is also a raw material for making clove oil which is currently Indonesia as the main supplier of clove oil in the world to countries such as India, Saudi Arabia, Vietnam, and even the United States (Bustaman, 2016).

Essential oil products are also a market opportunity that should be taken by Indonesia as the largest clove producer, so that clove derivative products are more varied and not only absorbed by the cigarette industry. The essential oil industry needs to be developed in order to be able to compete in the international market by improving quality. In addition to developing countries such as Madagascar and Tanzania, there are several developed countries that are also producers of essential oils such as France, Germany, Italy and the United Kingdom, but the essential oils are exported mostly in semi-finished forms. The difference with their developed countries even though they import essential oils in the form of semi-finished but they process the oil into more value-added products and re-export to other countries including developing

countries. This market opportunity can still be improved given the increasing world market demand (Alighiri et al., 2017). Indonesia's clove production continues to fluctuate and tends to increase along with the increasing needs of the domestic and international markets that are increasingly high. This is indicated by the amount of production from various major clove producing countries in the world in the last ten years, Indonesia ranks first showing the highest number of differences very far from competing countries. However, Indonesia is still very low in terms of productivity in the range of 0.2 - 0.3 tons/ha/year lagging far behind the main competitor country namely Tanzania in the range of 1 - 1.2 tons /ha/year (FAO, 2019).

Indonesian clove commodities have competitiveness in terms of comparative and competitive advantages compared to other countries in the international market and the ASEAN region with the contribution of planted area generating 79.80% and 70.99% market share in international markets (Tupamahu, 2015). Indonesian clove commodities are not only exported in the form of raw materials in the form of dry cloves but also in the form of clove cigarettes. Clove cigarette export destinations include Malaysia, Thailand, Cambodia, and Jordan (Kuncoro, 2014).

Although known as the country with the highest clove producer in the world, at the same time Indonesia is also the largest clove importer country. This can be seen from the highest value of Indonesian Cloves which reached US\$ 345,150,592 in 2011 and US\$ 113,463,406 in 2017 while Indonesia's Highest export value occurred in 2015 only reached US\$ 46,483,663 (UNComtrade, 2019). The increasing value of clove imports from abroad indicates that national clove production is still unable to supply the needs of the domestic industry that continues to grow to this day (Wahyudi, 2016b). This is even supported by government policies as outlined in the Minister of Trade Regulation (Permendag) No. 75 of 2015 which regulates the liberation of clove imports from abroad. According to the Indonesian Clove Farmers Association (APCI), this is considered to be very pressing and

detrimental to the clove farmers because it causes domestic clove prices to be low and farmers to lose the opportunity to pass a decent price that they should have obtained.

The Government of Indonesia once implemented a policy to limit the entry of imports of cloves into the country in 2002 through Minister of Industry and Trade Regulation No. 7 of 2002 even though at that time Indonesia had signed an agreement with the WTO (World Trade Organization). This was a brave step taken by the Government of Indonesia at the time to control the import of cloves which could make domestic clove prices plummet. The decree states that clove imports can only be carried out by importers who obtain permits and licenses from the government (Suprihanti et al., 2018).

Based on the description above, this study aims to determine the competitiveness of Indonesian cloves in the international market and competitor countries or major clove producers and discuss the factors that affect the competitiveness of Indonesian cloves and major producing countries in the international market.

RESEARCH METHODS

The data used in this study are secondary data obtained from several sources including UNComtrade, Trade Map, FAO, and World Bank. After that the data is compiled in the form of time-series data from 2000 - 2017 and a cross-section covering five main clove producing countries namely Indonesia, Madagascar and Tanzania, Sri Lanka and Comoros.

This study discusses the competitiveness of clove exports to the international market from the five major clove producing countries in the world and the factors that affect the competitiveness of exports from the five countries. Indicators of export competitiveness are measured by the RCA (Revealed Comparative Advantage), AR (Acceleration Ratio), and EPD (Export Product Dynamic) methods, while to know the factors that affect export competitiveness are carried out using panel data regression methods that combine time series data and cross-section.

RCA (Revealed Comparative Advantage) is one method that can be used to see the export performance and market share of a country's export commodities to the export share of these commodities from around the world (Saragih *et al.*, 2013). Trade that occurs between regions as formulated in the RCA concept can also indicate the competitiveness of the comparative advantage of an area (Nurhayati *et al.*, 2018). The RCA is mathematically formulated as follows:

$$RCA = \frac{(X_{ijt}/X_{jt})}{(W_{it}/W_t)}$$

Where:

X_{ijt} : The value of commodity exports i by country j in year t

X_{jt} : Total value of country j exports in year t

W_{it} : The world export value of commodity i in year t

W_t : Total value of world exports in year t

RCA value is more than one ($RCA > 1$), so the share of commodities (i) from countries (j) is greater than the average share of commodity exports (i) from all countries in the world, which means the commodity has high competitiveness. If the RCA value is equal to one ($RCA = 1$) then the share of commodities (i) from the country (j) is equal to the average share of commodity exports (i) from all countries in the world which means the commodity has the same competitiveness as the average world flat. While if the value of the RCA is less than 1 ($RCA < 1$) then the share of commodities (i) from the country (j) is smaller than the average share of commodity exports (i) of all countries in the world which means the commodity has a low competitiveness (Darwanto, 2011).

The Acceleration Ratio (AR) method is used to compare the acceleration of a country's export growth to the acceleration of world import growth. The AR method can also be used as an indicator of whether a country's commodity can capture the market or not (Tambunan, 2004). Mathematically formulated as follows:

$$AR = \frac{(\text{Trend } X_{ij} + 100)}{(\text{Trend } M_i + 100)}$$

Where

X_{ij} : Export value of commodity i in country j

M_i : Global import values for commodities i

AR calculation results can be stated if AR approaches or more than one ($AR > 1$) then the commodity of that country has a comparative advantage and can capture the market for world clove exports, whereas if AR is less than or equal to one ($AR \leq 1$) then the commodity the country does not have a comparative advantage or the country's position is still weak in clove exports compared to other countries (Darwanto, 2011; Alatas, 2015).

Export Product Dynamics (EPD) is one indicator of competitiveness used to measure the market position and dynamic of a country's products in the international market. There are four categories that explain the position of the product analyzed in the EPD matrix (Hasibuan *et al.*, 2012). To find out the position of a product can be obtained from the conversion from the quadrant image below. The position in the awareness represents the business strength (X) and market attractiveness (Y) of a product. Mathematically formulated as follows:

$$\frac{\sum_{t=1}^n \frac{(X_i)}{(W_i)}^t \times 100 \% - \sum_{t=1}^n \frac{(X_i)}{(W_i)}^{t-1} \times 100 \%}{T}$$

Whereas the market attraction (Y) is mathematically formulated as follows:

$$\frac{\sum_{t=1}^n \frac{(X_t)}{(W_t)}^t \times 100 \% - \sum_{t=1}^n \frac{(X_t)}{(W_t)}^{t-1} \times 100 \%}{T}$$

Where:

X_i : Export value of product i country j

X_t : Total value of country exports j

W_i : The export value of the world's products

W_t : The total value of world exports

T : Number of years of analysis

Panel Data Regression Analysis Method is used to determine the factors that affect the

competitiveness of exports from the five major clove producing countries of the world. The dependent variable used in this study is the RCA calculation results and the independent variables in this study are productions, market share, clove export prices, real GDP (Gross Domestic Product) of the five main producing countries.

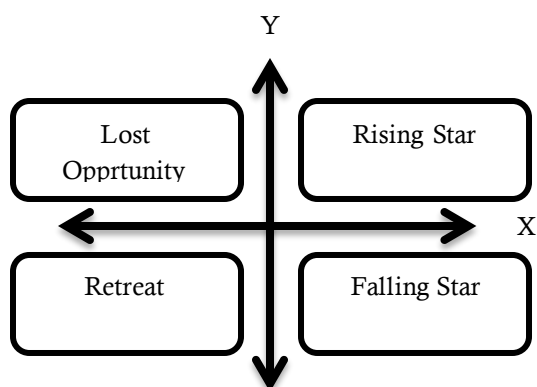


Figure 1. Position Competitiveness of Products by the EPD Method

Source: Esterhuizen (2006)

The regression model used is as follows:

$$\ln RCA_i^t = \alpha_i + \beta_1 \ln Pro_i^t + \beta_2 \ln PP_i^t + \beta_3 \ln HE_i^t + \beta_4 \ln GDP_i^t$$

Notes:

- $\ln RCA_i^t$: RCA country i in year t
- α_i : Interception
- $\beta_1 - \beta_4$: Regression coefficient
- $\ln Pro_i^t$: Production of clove state i in year t
- $\ln PP_i^t$: The clove market share of country i in year t
- $\ln HE_i^t$: The export price of clove i country in year t
- $\ln GDP_i^t$: The real GDP country i in year t

There are several stages used in conducting the regression method using panel data to select a regression model. The regression model known in panel data analysis are pooled least square / common effect model (CEM), fixed effect model (FEM), and random effect model (REM). The selection of the best model is done with several test stages consisting of the

Chow test, the Hausman test, and the Breusch-Pagan test (Lagrange Multiplier) (Agusalim *et al.*, 2019). Then the coefficient of determination R^2 test is performed to determine the goodness of fit of the regression model used and how much the independent variable can explain the dependent variable. The F test is carried out to determine the effect of the independent variables simultaneously or together and the t-test is carried out to find out how much influence the independent variable has on the dependent variable partially or individually (Gujarati and Porter, 2009)

RESULTS AND DISCUSSION

The competitiveness of a country can be seen from one aspect namely the trade aspects, especially related to exports and imports. The RCA analysis used in this study aims to measure the performance of clove exports of major producing countries in the international market while evaluating the role of clove exports in the total exports of each of these countries compared to the share of total clove exports in world trade. The position of competitiveness of Indonesian clove commodities and major clove producing countries in the international market can be seen in Table 1.

Based on the results of the analysis from 2000-2017, the development of Indonesia's RCA index fluctuated but generally tended to increase. The average value of the Indonesian RCA index from 2000-2017 is 11.28 or more than 1 which means that Indonesian clove commodities have competitiveness in the international market, but when compared with other major producing countries Indonesia has the lowest RCA index. This is because countries such as Madagascar, Tanzania, Sri Lanka, and Comoros make clove as a mainstay export commodity from their country and become one of the largest foreign exchange earners for each of these countries.

On the other hand, although Indonesia is known as the highest producer of cloves in terms of production, Indonesia often imports to meet domestic industrial needs, only a small portion of Indonesian cloves are exported abroad, which is

around 10-15% of the national clove production (FAO, 2019; UNComtrade, 2019). Based on the results of the analysis of the highest average RCA index sequentially starting from the highest are Comoros (19,079.47), Madagascar (2,699.82), Tanzania (328.40) and Sri Lanka (163.79). This shows that even though Indonesia has the highest clove production in the world, Indonesia has not been able to become a major exporting country in the international market because Indonesia acts as the largest producer and producer country in the world.

The majority of cloves imported by Indonesia come from Madagascar. There are several favorable factors for the Madagascar clove plantation sector including its ecological and environmental compatibility, low production costs, high demand from importing countries, especially Indonesia and demand for the volatile oil and eugenol industrial sectors. The Indonesian market is the main target of the clove plantation sector in Madagascar due to the large number of local and multinational cigarette industries operating in Indonesia which often lack stock of raw material supplies (Danthu *et al.*, 2014).

The number of cloves trade in the international market is almost balanced between demand and supply, if there is a change in the demand and supply of cloves in the world it will affect the price of cloves at the world level. For example, if a major exporter such as Madagascar reduces its supply, it will increase the price of cloves at the world level (Suprihanti *et al.*, 2018).

Clove is a type of estate crop that is traded internationally, in some countries in Europe and America clove is used as a spice for cooking spicy food. Besides being known for clove spices, it also contains eugenol which is often used for the perfume, soap, anesthesia and pharmaceutical industries. Indonesia's main clove markets at the moment are Saudi Arabia, Vietnam and Pakistan. The amount of export value of each

main destination market fluctuates every year depending on the availability of supply in major producing countries and the prices prevailing in the international market (Nurhayati *et al.*, 2018).

The Acceleration Ratio (AR) Index is one indicator used to determine the comparative advantage of a product in a country and see the acceleration of the export growth of a product in a country towards the growth of world imports. The result of the AR analysis from five countries namely Indonesia, Madagascar, Tanzania, Sri Lanka, and Comoros during 2000-2017 show that Indonesia has an AR value of less than one ($AR < 1$) which means that Indonesia's clove position still tends to be weak in the international market, as well as Tanzania and Sri Lanka. It shows that the three countries have no comparative advantage and are still weak in clove exports because they have not been able to accompany the global clove import trend. It is different from Madagascar and Comoros which shows AR value of more than one ($AR > 1$) which means that the two countries can seize the world clove export market and have a comparative advantage on their products. The existence of trade facilities can increase the benefits of export growth including regulations related to product standards that must be met in international trade such as Sanitary and Phytosanitary Measures (SPS). This is related to food safety provisions including cloves as export spices such as water content and mushroom threshold. This has not been well socialized to business actors to the farmer level because access to information is still minimal so it affects the quality of exports (Hermawan, 2015).

Indonesia itself experienced a ban on the export of cloves to the United States market in 2009, which was implemented by the Food and Drug Administration (FDA) of the United States which caused the loss of a portion of the clove export market share during this period (Delnevo and Hrywna, 2015).

Table 1. Development of RCAs in Indonesia and Major Clove Producing Countries in International Markets 2000-2017

Year	Indonesia	Madagascar	Tanzania	Sri Lanka	Comoros
2000	8,30	3.313,40	669,55	46,19	12.455,49
2001	5,85	2.974,00	498,77	84,76	6.601,24
2002	17,93	1.379,32	234,89	235,95	2.840,23
2003	24,17	1.763,37	537,09	72,59	613,64
2004	12,07	1.495,12	377,60	137,28	3.225,40
2005	15,08	1.723,18	440,29	246,37	8.801,06
2006	20,73	2.375,34	382,38	164,99	28.857,80
2007	26,34	2.508,44	356,65	106,30	6.359,13
2008	5,51	1.878,38	450,77	419,84	55.719,39
2009	3,37	3.099,44	336,99	118,39	37.039,93
2010	7,38	2.711,59	186,16	417,50	54.501,12
2011	1,95	3.094,85	161,72	86,08	18.164,75
2012	5,71	6.006,07	295,29	85,80	31.441,32
2013	7,81	3.009,81	547,93	276,37	25.294,15
2014	8,99	2.379,87	252,32	57,35	15.065,29
2015	13,74	3.318,97	22,13	200,01	19.013,18
2016	12,08	2.782,29	91,52	53,56	9.365,21
2017	5,95	2.783,35	69,06	138,93	8.072,08
Average	11,28	2.699,82	328,40	163,79	19.079,47

Source: Secondary Data Analysis, 2019 (Processed)

Export Product Dynamic (EPD) is one indicator that is able to show the market position of a country's products in international markets and show the competitive advantage of a country's products by looking at the share of products in international trade and the share of country exports (Pradipta and Firdaus, 2014). The results of the EPD analysis of Indonesia and the main clove producing countries from 2000-2017 can be seen in Table 3. Based on the EPD

analysis results from 2000-2017 shows that the clove products of Indonesia, Madagascar, Tanzania, and Comoros are in the rising star which means the products from these countries are competitive products and have a competitive advantage in the international market. This is marked by an increase in the share of product and share of country exports which is directly proportional or positive.

Table 2. Value of Acceleration Ratio of Indonesia and Major Clove Producing Countries in International Markets 2000-2017

Country	Trend of Clove Export	Trend of Clove World Import	Acceleration Ratio
Indonesia	0,057	0,0834	0,99974
Madagascar	0,114	0,0834	1,00031
Tanzania	0,0352	0,0834	0,99952
Sri Lanka	0,081	0,0834	0,99998
Comoros	0,2521	0,0834	1,00169

Source: Secondary Data Analysis, 2019 (Processed)

The only country that is in a falling star position is Sri Lanka, this indicates that the

market share of clove products has increased but the products are not dynamic or tend to stagnate

in other words the share of products has increased while the share of country exports has experienced negative growth. The research of (Nurhayati *et al.*, 2018) shows that Indonesia's clove exports in the Thailand, Pakistan, and Egypt markets are in a rising star position, while for the United Arab Emirates, Vietnam, Saudi Arabia, Australia and Germany markets Indonesia's position is in a falling star and for Malaysian and Dutch markets are in a position of lost opportunity.

The condition of the world market in international trade that is increasingly competitive now requires each country to increase competitiveness in terms of quality, price, cleanliness of products and services.

Agricultural commodities are one of the products that are susceptible to rejection from other countries related to the feasibility of the cleanliness of the product from pesticide residues and damage due to pests and diseases. If not considered, it will be detrimental to Indonesia and affect export volume (Nihayah, 2012).

Indonesian clove production has great potential to be continuously improved, this is supported by the vast area of clove plantations that has not been well optimized. Advantages in terms of a land area not owned by competing countries, this should be used by Indonesia to increase exports and meet the needs of domestic industries.

Table 3. Market Position of Indonesia and Major Clove Producing Countries in International Markets in 2000-2017

Country	X	Y	EPD Position
Indonesia	28,93211071	1,120442112	Rising Star
Madagascar	9,031589488	15,60460671	Rising Star
Tanzania	50,02382521	5,628915757	Rising Star
Sri Lanka	58,42553254	-0,3990388	Falling Star
Comoros	45,9995166	37,40460191	Rising Star

Source: Secondary Data Analysis, 2019 (Processed)

There are several test stages in choosing a model using panel data regression analysis including Chow test, Hausman test and Breusch-Pagan test (Lagrange Multiplier). This is done to determine the best model to be chosen for use. Based on the Chow test results in Table 4, the probability value of F is 0.0000, which means that the probability value of F is smaller than

alpha ($p\text{-value} < 0.05$) so that the better model used is the fixed effect model (FEM) rather than the common effect model (CEM). Furthermore, after the fixed effect model (FEM) was chosen as the best model, it is necessary to carry out further testing namely the Hausman test to find out which is better between the fixed effect model (FEM) or random effect model (REM).

Table 4. Chow Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	17.302293	(4,81)	0.0000
Cross-section Chi-square	55.582169	4	0.0000

Source: Secondary Data Analysis, 2019 (Processed)

Based on the Hausman test results in Table 5, the chi-square probability value is 0.0000,

which means that the chi-square probability value is smaller than alpha ($p\text{-value} < 0.05$) so

that the better model is the fixed effect model (FEM) rather than the random effect model (REM). Based on the results of the Chow test and Hausman test conducted, the chosen model is the fixed effect model (FEM) so that for further tests,

the Breusch-Pagan test (Lagrange Multiplier) to choose between random effect models (REM) or common effect models (CEM) can be ignored or not done.

Table 5. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	69.209174	4	0.0000

Source: Secondary Data Analysis, 2019 (Processed)

Based on the test stage, the best results are fixed-effect models (FEM) that describe the factors that affect the competitiveness (RCA) of major clove producing countries in the international market. The results of panel data regression analysis in Table 6 show that the value of Adjusted R^2 obtained is 0.977306 which means that 97.73% of the variation in the competitiveness dependent variable (RCA) can be explained by the independent variables included in the model namely production, market share, price exports, and real GDP, while the remaining 2.27% is explained by other variables outside the model not included in the study. The closer to 100% it shows the accuracy or goodness of fit, the better of the model used.

The F test in this study was conducted to determine the dependent variable simultaneously or together. Based on the results of the analysis in Table 6, it is obtained that the probability value F is 0.0000 which indicates that this value is smaller than alpha (p-value <0.05) which means that the productivity, market share, export price, and real GDP variables together affect the competitiveness (RCA) of major clove producing countries in the international market. The constant value influences the level of 90% (p-value <0.1) with a regression coefficient of 16.16198 which means the minimum value of exports of major clove producing countries to the

international market when the independent variable in the model is zero or is considered to be 16,16198 %.

Based on the results of the t-test analysis in Table 6, it can be seen that the factors that influence the competitiveness of the major clove producing countries in the international market significantly during the 2000-2017 period are the market share and real GDP while production variables and export prices have no significant effect. Clove market share has a positive and significant influence on the competitiveness of major clove producing countries in international markets which can be interpreted that every one percent increase in the market share of major clove producing countries in international markets will increase 0.87% RCA of clove major producing countries in international markets.

The market share shows the ability of a country's products to compete in international markets where the greater market share means the wider market reach of a country's products in the international market. An increase in market share can also reflect the competitive strength of a country's product, whether or not a dynamic product can be known if it's market share growth is faster than the average growth of all products (Esterhuizen, 2006). This condition indicates that Indonesia still has a great opportunity to seize the world clove market and increase its market share.

Table 6. Analysis Results of Factors Affecting the Competitiveness of Cloves in Indonesia and Major Producing Countries in International Markets 2000-2017

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.16198***	5.021650	3.218460	0.0019
LNPRODUKSI	0.138288 ^{ns}	0.184097	0.751168	0.4547
LNPP	0.874943***	0.058702	14.90488	0.0000
LNHE	0.138472 ^{ns}	0.104673	-1.322898	0.1896
LNGDP_RIIL	0.411778*	0.229973	-1.790552	0.0771
R-squared	0.977306			
Adjusted R-squared	0.975064			
Prob(F-statistic)	0.000000			

Source: Secondary Data Analysis, 2019 (Processed)

Notes:

* Significant at alpha 90% ($\alpha = 0,1$)

*** Significant at alpha 99% ($\alpha = 0,01$)

ns: Non Significant

The real GDP has a negative and significant effect on the competitiveness of major clove producing countries in the international market which can be interpreted that every one percent increase in real GDP of major clove producing countries will reduce 0.41% of the clove RCA of major producing countries in the international market. An increase in real GDP of the world's major clove producing countries shows increasing purchasing power which causes consumption to increase so that fewer cloves are exported abroad. The greater the real GDP of a country reflects the greater the ability of exports or imports of a country with other countries (Kusuma and Firdaus, 2015).

This is in line with research Pratama and Darwanto, (2019) which occurs in Indonesia which is the country with the highest clove production in the world but often imports from outside because national clove production is still unable to meet the needs of domestic industries, even today Indonesia listed as the number one clove importing country in the world with an import value of US \$ 161 billion (Observatory of Economic Complexity, 2019).

The increase in Indonesia's GDP was not only obtained from exports of raw products in the form of dried clove flowers but also from the growing clove cigarette industry that needed raw

materials so that Indonesia had to import when domestic supply was not available, imports from outside which had a negative influence on the competitiveness of cloves although on the one hand GDP increased with the kretek cigarette industry. Kuncoro (2014) mentioned the dominant role of the kretek cigarette industry such as PT. Gudang Garam, PT.HM Sampoerna and PT.Djarum in the country greatly influenced the absorption of national cloves, the labor sector and the absorption of cigarette excise tax.

This is very different from other major competing countries such as Madagascar and Comoros where they rely heavily on the clove plantation sector to support their economy. The share of clove exports to GDP of these countries is relatively high because the clove plantation sector is an important sector for foreign exchange earnings, however, when compared to Indonesia the GDP of Madagascar and Tanzania are very different where Indonesia's GDP reaches 1.1 trillion USD while Madagascar 11.3 billion USD and Comoros 1.1 billion USD. This certainly looks very much different where Indonesia only makes the clove plantation sector as one of the foreign exchange-earners of many other strategic plantation commodities, while Madagascar and Comoros make it as the main sector (World Bank, 2019).

CONCLUSION

Overall clove products of the main producing countries during the period 2000-2017 have strong competitiveness but the level of clove competitiveness of the major producing countries in the world is at different levels. Based on the RCA indicator, it is known that Comoros ranks highest and Indonesia ranks lowest, while from the AR indicator only Madagascar and Comoros score more than one, meaning that both countries are able to capture the export market share in the international market. The resulting EPD indicator places Indonesia, Madagascar, Tanzania, and Comoros in the rising star position while only Sri Lanka occupies the falling star position.

Variables that significantly affect the competitiveness (RCA) of major producing country cloves in international markets are the market share and real GDP. The market share variable has a positive effect and real GDP has a negative effect on RCA, while the production and export price variables have no significant effect on the clove competitiveness of major producing countries in the international market. As one of the main producing countries with the highest production of cloves, Indonesia must be able to increase the competitiveness of its clove products by boldly suppressing imports from abroad and increasing domestic clove production with various policies such as intensification and rehabilitation of national clove plantations in an effort to meet domestic industry needs and international markets in order to lead to increased Indonesian clove competitiveness in the international market.

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Appendix

Common Effect Model (CEM)

Dependent Variable: LNRCA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.84542	1.001714	35.78409	0.0000
LNPRODUKSI	0.149191	0.078836	1.892418	0.0618
LNPP	0.547427	0.052727	10.38235	0.0000
LNHE	0.037210	0.108346	0.343432	0.7321
LNGDP_RIIL	-1.290221	0.042419	-30.41597	0.0000
R-squared	0.957915	Mean dependent var		5.976943
Adjusted R-squared	0.955934	S.D. dependent var		2.606249
S.E. of regression	0.547098	Akaike info criterion		1.685577
Sum squared resid	25.44192	Schwarz criterion		1.824455
Log likelihood	-70.85096	Hannan-Quinn criter.		1.741581
F-statistic	483.6794	Durbin-Watson stat		0.780547
Prob(F-statistic)	0.000000			

Fixed Effect Model (FEM)

Dependent Variable: LNRCA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.16198	5.021650	3.218460	0.0019
LNPRODUKSI	0.138288	0.184097	0.751168	0.4547
LNPP	0.874943	0.058702	14.90488	0.0000
LNHE	-0.138472	0.104673	-1.322898	0.1896
LNGDP_RIIL	-0.411778	0.229973	-1.790552	0.0771
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.977306	Mean dependent var		5.976943
Adjusted R-squared	0.975064	S.D. dependent var		2.606249
S.E. of regression	0.411554	Akaike info criterion		1.156886
Sum squared resid	13.71951	Schwarz criterion		1.406867
Log likelihood	-43.05987	Hannan-Quinn criter.		1.257693
F-statistic	436.0222	Durbin-Watson stat		0.816346
Prob(F-statistic)	0.000000			

Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	17.302293	(4,81)	0.0000
Cross-section Chi-square	55.582169	4	0.0000

Cross-section fixed effects test equation:

Dependent Variable: LNRCA

Method: Panel Least Squares

Date: 12/02/19 Time: 01:06

Sample: 2000 2017

Periods included: 18

Cross-sections included: 5

Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.84542	1.001714	35.78409	0.0000
LNPRODUKSI	0.149191	0.078836	1.892418	0.0618
LNPP	0.547427	0.052727	10.38235	0.0000
LNHE	0.037210	0.108346	0.343432	0.7321
LNGDP_RIIL	-1.290221	0.042419	-30.41597	0.0000
R-squared	0.957915	Mean dependent var	5.976943	
Adjusted R-squared	0.955934	S.D. dependent var	2.606249	
S.E. of regression	0.547098	Akaike info criterion	1.685577	
Sum squared resid	25.44192	Schwarz criterion	1.824455	
Log likelihood	-70.85096	Hannan-Quinn criter.	1.741581	
F-statistic	483.6794	Durbin-Watson stat	0.780547	
Prob(F-statistic)	0.000000			

Random Effect Model (REM)

Dependent Variable: LNRCA

Method: Panel EGLS (Cross-section random effects)

Date: 12/02/19 Time: 01:06

Sample: 2000 2017

Periods included: 18

Cross-sections included: 5

Total panel (balanced) observations: 90

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.84542	0.753538	47.56952	0.0000
LNPRODUKSI	0.149191	0.059304	2.515682	0.0138
LNPP	0.547427	0.039664	13.80175	0.0000
LNHE	0.037210	0.081503	0.456541	0.6492
LNGDP_RIIL	-1.290221	0.031910	-40.43341	0.0000
Effects Specification				
			S.D.	Rho
Cross-section random			8.19E-07	0.0000
Idiosyncratic random			0.411554	1.0000
Weighted Statistics				
R-squared	0.957915	Mean dependent var	5.976943	
Adjusted R-squared	0.955934	S.D. dependent var	2.606249	
S.E. of regression	0.547098	Sum squared resid	25.44192	
F-statistic	483.6794	Durbin-Watson stat	0.780547	
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.957915	Mean dependent var	5.976943	
Sum squared resid	25.44192	Durbin-Watson stat	0.780547	

Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	69.209174	4	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LNPRODUKSI	0.138288	0.149191	0.030375	0.9501
LNPP	0.874943	0.547427	0.001873	0.0000
LNHE	-0.138472	0.037210	0.004314	0.0075
LNGDP_RIIL	-0.411778	-1.290221	0.051869	0.0001

Cross-section random effects test equation:

Dependent Variable: LNRCA

Method: Panel Least Squares

Date: 12/02/19 Time: 01:09

Sample: 2000 2017

Periods included: 18

Cross-sections included: 5

Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.16198	5.021650	3.218460	0.0019
LNPRODUKSI	0.138288	0.184097	0.751168	0.4547
LNPP	0.874943	0.058702	14.90488	0.0000
LNHE	-0.138472	0.104673	-1.322898	0.1896
LNGDP_RIIL	-0.411778	0.229973	-1.790552	0.0771

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.977306	Mean dependent var	5.976943
Adjusted R-squared	0.975064	S.D. dependent var	2.606249
S.E. of regression	0.411554	Akaike info criterion	1.156886
Sum squared resid	13.71951	Schwarz criterion	1.406867
Log likelihood	-43.05987	Hannan-Quinn criter.	1.257693
F-statistic	436.0222	Durbin-Watson stat	0.816346
Prob(F-statistic)	0.000000		