RELATIVE EXPORT COMPETITIVENESS IN INDONESIAN AND MALAYSIAN PALM OIL DOWNSTREAM PRODUCTS

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Abstract: Palm oil is an important commodity between Indonesia and Malaysia with a higher contribution to the national economy. However, the investigation into its competitiveness is still important due to fierce competition in the global world. This study aims to investigate the Relative Export Competitiveness (REC) of palm oil downstream and its determinant factors between Indonesia and Malaysia from 1970 until 2020. This study utilizes REC based on merchandise trade and multiple regression by using several variables influencing its REC. The findings reveal that REC in Indonesia has been greater than that of Malaysia over the past 20 years. Initially, Malaysia had a stronger position in REC than Indonesia, particularly from 1971 to 1997. Our analysis demonstrates that REC in Indonesia is positively influenced by factors such as the palm oil policy, the existence of palm oil organizations, and the official exchange rate. Conversely, GDP per capita and the palm oil policy positively impact Malaysia's REC. However, Foreign Direct Investment (FDI) and the ASEAN Free Trade Agreement (AFTA) have a negative effect on REC in both countries. Based on these results, Indonesia and Malaysia must examine proper palm oil downstream policy to boost competitiveness.

Keywords: business analytics, determinant factor, palm oil downstream, relative export competitiveness, trade

Abstrak: *Kelapa sawit merupakan komoditas penting antara Indonesia dan Malaysia dengan kontribusi yang lebih tinggi bagi perekonomian nasional. Namun, kajian daya saingnya tetap penting mengingat ketatnya persaingan di dunia global. Penelitian ini bertujuan untuk memperbaiki Relative Export Competitiveness (REC) hilir kelapa sawit dan faktor determinannya antara Indonesia dan Malaysia dari tahun 1970 hingga 2020. Penelitian ini menggunakan REC berdasarkan perdagangan barang dan regresi berganda dengan menggunakan beberapa variabel yang mempengaruhi REC. Temuan menunjukkan bahwa selama 20 tahun terakhir, REC di Indonesia lebih tinggi daripada di Malaysia. Pada awalnya, Malaysia memiliki posisi yang lebih kuat dalam REC dibandingkan dengan Indonesia, terutama dari tahun 1971 hingga 1997. Analisis kami menunjukkan bahwa REC di Indonesia dipengaruhi secara positif oleh faktor-faktor seperti kebijakan kelapa sawit, keberadaan organisasi kelapa sawit, dan nilai tukar resmi. Di sisi lain, GDP per kapita dan kebijakan minyak sawit memiliki dampak positif terhadap REC di Malaysia. Namun, Foreign Direct Investment (FDI) dan ASEAN Free Trade Agreement (AFTA) memiliki dampak negatif terhadap REC di kedua negara. Berdasarkan dari hasil ini, Indonesia dan Malaysia perlu mempertimbangkan kebijakan produk turunan kelapa sawit untuk meningkatkan daya saing.*

Kata kunci: *analitika bisnis, hilirisasi kelapa sawit, daya saing relatif ekspor, faktor penentu, perdagangan*

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INTRODUCTION

Palm oil currently became the essential commodity in global market due to rapid improvement than other vegetable oil commodities. According to (Statista, 2023a), the palm oil production in million metric tons increased rapidly from 58.92 in 2015/16 to 73.83 in 2021/22. Furthermore, It is also implicates on the enhancement of consumption in million metric tons from 59.38 in 2015/16 to 71.118 in 2021/22 (Statista, 2023b). From trade statistic, palm is the most-traded vegetable oil in the world market. According to (Food and Agriculture Organization (FAO), 2023), the trade of palm oil has already reached 36.81%, followed by soya bean oil (14.44%), sunflower-seed oil (11.27%), olive oil (9.36%), and rapeseed or canola oil (7.91%). It was supported by the versatility of palm oil application for the various processed product, namely food (68%), industrial applications (27%), and bioenergy (5%) across the world (Our World in Data, 2023). The economic contributions of palm oil industry are enhancement of income, creating a job, and reduce unemployment for both Indonesia and Malaysia as the main supplier of palm oil (Nambiappan et al. 2018). On the other hand, palm oil also increase the regional economy by adopting the cultivation and processing the product (Suroso & Ramadhan, 2014). Furthermore, this industry can increase the welfare of smallholder through the improvement of household consumption expenditure, calorie consumption and dietary quality (Euler et al. 2017). However, there are several limitations of Crude Palm Oil (CPO) trade in global world like the fierce competition, consumer perception to palm oil product, and the sustainability issues (Saswattecha et al. 2015; Verneau et al. 2019; Syahza et al. 2020; Destiarni et al. 2021). Therefore, palm oil must be developed into downstream product for expanding the export and reducing the import.

Both of Indonesia and Malaysia currently develop the palm oil downstream industry in Indonesia. It is due to advantage of the palm oil production as a feedstock, implicating the higher export competitiveness in crude and refined palm oil in the world (Tandra et al. 2022). Figure 1 revealed the performance of palm oil downstream export for both Indonesia and Malaysia from 1971 until 2020. There is a positive trend in both of countries, means that the palm oil downstream export has a good prospect in global market. The palm oil downstream is essential commodity to increase the

higher value of export and implicate the escalation of economic growth. However, Indonesia and Malaysia only rank 8th and 9th as exporters of palm oil downstream products, respectively. Both countries are still inferior to other exporting countries, such as Germany, the Netherlands, the United States, France, and Belgium (UN Comtrade, 2022). On the other hand, Indonesia and Malaysia have an advantage in raw materials for downstream development. It must be optimized to be the downstream product by increasing its export performance, implicated in the higher competitiveness of palm oil downstream exports.

The investigation of competitiveness commonly utilizes the RCA due to powerful tool for making descriptive trade statistics (Deardorff, 2011). Additionally, this method can be used to determine the policies through the RCA value (Mizik et al. 2020). There are many studies implemented RCA to examining the competitiveness, especially in palm oil and its downstream products. (Arsyad et al. 2020) use RCA to investigating the competitiveness of palm oil for both Indonesia and Malaysia. The result reveal that Indonesia's RBD palm olein and PFAD are more competitive compared to Malaysia. (Ramadhani & Santoso, 2019) examine the competitiveness of palm oil between Indonesia and Malaysia to major market, such as China, Singapore, India, Pakistan, and Netherlands. This study reveals that the RCA and RSCA for both countries is positive from 2001 to 2014. In addition, The RCA and RSCA of Indonesia are higher than Malaysia. (Tandra et al. 2022) utilize the RSCA as a linier form of RCA to examining the global competitiveness of palm oil trade. The result show that three countries with higher competitiveness in last three decades (from 1996 until 2019) are Malaysia, Indonesia and Niger. (Pambudi et al. 2019) examines the competitiveness of Indonesian biodiesel exports to export destination countries during the period 2012-2016 with the product code HS 382600. The results of his research show that Indonesia has an average comparative competitiveness against Australia, Singapore, Spain, United States, China, and the Netherlands. (Othman et al. 2020) investigates the competitiveness of Malaysian biodiesel exports in the global market for sustainable energy. The findings from this study are that Malaysia has a comparative loss in biodiesel products, both HS 271020 and HS 382600 during 2012-2016. Export trends also show that Malaysia's export competitiveness performance fluctuates.
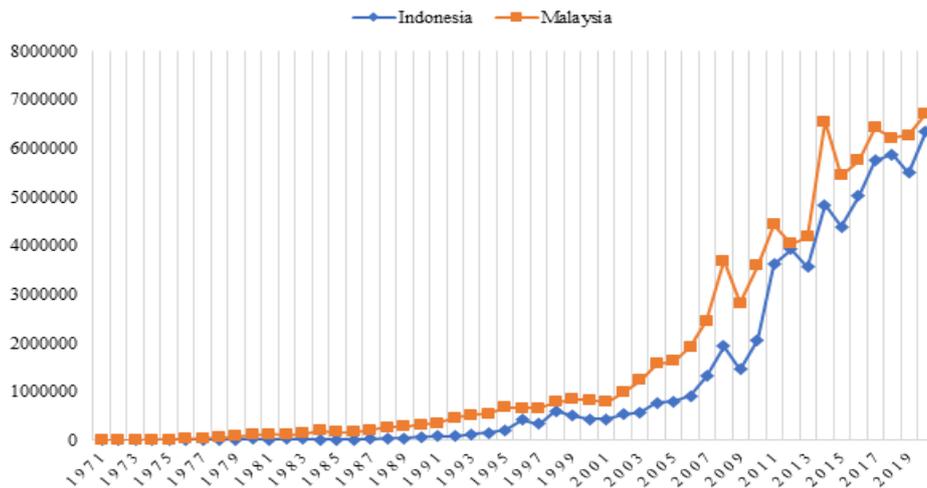
Figure 1. Palm oil downstream exports between Indonesia and Malaysia (in USD)(FAO, 2023)

The concept of REC has already implemented by previous studies. However, the application commonly found in agriculture commodity between aggregate and disaggregate forms. (Narayan & Bhattacharya, 2019) utilize REC to examines the export competitiveness of India's top agricultural exports, namely rice, wheat, cotton, and sugar. The result show that India's exports of all four commodities became relatively competitive over time, although they lagged the leading or certain chosen developing exporters of the four commodities. Furthermore, there several factors are tested in our regression model of the study, namely crop-specific and aggregate factor endowments, domestic price, export prices, and GDP per capita, preferential trade agreements, export restrictions and bans, and India's Green Revolution. The regression result reveal that Capital had negative effects on cotton REC. Meanwhile, the Green Revolution has a positive and significant effect on the REC in rice and cotton. The WTO had a positive effect on the REC in rice. The South Asian Free Trade Area (SAFTA) Agreement has negative effect on the REC in wheat and rice. Conversely, the SAFTA strengthened the REC in cotton and sugar. Higher domestic price reduced the REC in cotton. Higher per capita income strengthens the REC in wheat with a lag. (Abdullahi et al. 2022) investigate the REC of Nigeria cocoa industry from 1995 until 2018. The result show that Nigeria's cocoa exports are still competitive despite experiencing some declining stages. The determinant factors of REC in Nigeria cocoa industry are the positive effect of income per capita and the negative effect from domestic prices and African Growth Opportunity Act. (Kea et al. 2020) examine the REC of the Cambodian rice sector from 1995 to 2018. The finding reveals that Cambodia's rice exports became relatively competitive

over time. Furthermore, EBA, BRI, and income per capita have a positive effect and significant on the REC. Otherwise, the domestic price has a negative and significant effect on the REC.

Palm oil is the leading export in agricultural commodities in Indonesia and Malaysia, utilized potentially to palm oil downstream trade. Thus, the shifting from upstream to downstream sector can be implemented. This study utilizes the Relative Export Competitiveness (REC), motivated from some previous studies in case study of agriculture commodities (Kea et al. 2020; Abdullahi et al. 2022). Differ with Relative Comparative Advantage (RCA), this method compares the specific commodities to other commodity exclude it. Hence, the relative value of competitiveness can be obtained from the measurement of its share to the world market for palm oil downstream products against share of world exports of other commodities. The investigation in determinant factor of REC also implemented, including the economic factor and the domestic policy related to palm oil downstream product. Our novelty is study is the first examination of relative export competitiveness in manufactured agriculture product, producing the higher economic growth than agriculture export (Mlambo et al. 2019). Moreover, the literature about the REC of manufactured agriculture product still rare to found. There is no study applied REC to examine the palm oil competitiveness, especially its downstream products. Hence, it is becoming our motivation to doing the study and finding the determinant factor of REC, following the several previous studies (Narayan & Bhattacharya, 2019; Kea et al. 2020; Abdullahi et al. 2022). Moreover, the expected result is the formulation of managerial implication by considering a several factors influencing

REC. Therefore, we aim to examines the issue of REC in palm oil downstream products as the main processed product of agriculture for both Indonesia and Malaysia.

METHODS

The seminal research of (Balassa, 1965) about RCA, an indicator that has been widely used to examine the competitiveness and comparative advantage of particular commodities, served as the foundation for the creation of the REC index. We measure REC of palm oil downstream product for both Indonesia and Malaysia by comparing the value of export to merchandise export excluded the palm oil downstream product. This REC was utilized by (Kea et al. 2020; Abdullahi et al. 2022). Hence, we also utilize it in our relative export competitiveness analysis. This equation of REC can be written as a follow:

$$REC_{ijt} = (X_{ijt} / WX_t) / (MX_{ijt} / WMX_t) \quad .....(1)$$

Where X_{ijt} is the palm oil downstream export for both Indonesia (i) and Malaysia (j) in year t, WX_t is the world export of palm oil downstream in year t, MX_{ijt} is the Merchandise export excluded the palm oil downstream product for both Indonesia (i) and Malaysia (j) in year t, and WMX_t is the world merchandise export excluded the palm oil downstream product in year t. The value of REC above 1 indicates the competitiveness, and vice versa.

After gaining the value of REC for both countries, we utilize multiple regression to examine the determinant factor of REC. There are several variables included in our regression model. According to (Tandra et al. 2022; Török et al. 2020; Torok & Jambor, 2016), income level, population, endowment factors, and the trade agreement is some factors influencing competitiveness. According on these factors, the equation can be depicted as follows:

$$REC_t = \alpha0 + \alpha1LogGDPC_t + \alpha2FDI_t + \alpha3AFTA_t + \alpha4POP_t + \alpha5POIG_t + \alpha6LogOEXR_t + \varepsilon_t$$

Where REC_t is the relative export competitiveness in year (t), $GDPC_t$ is the Gross Domestic Product (GDP) per capita in year (t), FDI_t is the foreign direct investment in year (t), $AFTA_t$ is the dummy of ASEAN free trade agreement, POP_t is the population in year (t), $POIG_t$ is the dummy of palm oil organization, OEXR is the official exchange rate from local currency unit to USD in year (t), Log is the natural logarithm, $\alpha0$ to $\alpha6$ is the

coefficient term, and ε_t is the error term. This equation was applied for both countries, namely Indonesia and Malaysia. The development of hypotheses can be utilized as a follows:

GDP per capita is an important variable toward the export competitiveness. This variable can be proxied as the purchasing capacity of a person in a country. (Torok & Jambor, 2016; Balogh & Jámbor, 2017) found that GDP per capita has positive and significant effect on competitiveness, proxied Revealed Comparative Advantage (RCA) in agriculture products. However, (Török et al. 2020) revealed that GDP per capita has negative on competitiveness in beer trade product. Palm oil downstream is the value-added product with the high purchasing could lead the high output in global market. Hence it can implicate on the high competitiveness of trade.

Hypothesis 1 (H1). GDP per capita is positive and significant on REC

The endowment factor can increase the level of comparative advantage due to role as a capital to produce the downstream product. Foreign Direct Investment (FDI) can be source of country capital to increase national output. Based on several empirical studies, FDI has a positive and significant effect on export competitiveness (Zhang, 2015; Gamariel & Hove, 2019). Otherwise, FDI has no effect in case of global palm oil trade competitiveness (Tandra et al. 2022). In palm oil downstream, the role of FDI is important to accelerate the domestic production. Therefore, FDI is predicted as one of main factor influence on REC.

Hypothesis 2 (H2). FDI is positive and significant on REC

The trade agreement could lead the high export value through the expansion in certain area. It implicates on the level of comparative advantage from the escalation of export performance. The empirical studies related on international trade revealed that there is a positive and significant impact from trade agreement on trade performance (Pujiati et al. 2014; Glorius et al. 2021). It can influence on the increase of trade competitiveness. Thus, the effect of trade agreement is positive and significant through ASEAN free trade area due to oldest trade agreement between ASEAN countries, including Indonesia and Malaysia.

Hypothesis 3 (H3). AFTA is positive and significant on REC

The palm oil downstream policy in both countries could lead the competitiveness based on the objectives to strengthen the domestic palm oil downstream industry. There are several policies related on this development, namely export duty or export tax in producer country (Abdulla et al. 2014; Immanuel et al. 2019). The effect of palm oil downstream policy predicted to influence toward the competitiveness due to leading the high export value in global market. This policy also supports the international trade of palm oil downstream through the limitation of crude or refined palm oil as an important capital.

Hypothesis 4 (H4). POP is positive and significant on REC

The palm oil organization was developed by both countries to ensure the progress of domestic palm oil industry. In Malaysia, the role of MPOB is the strengthen in research and development related on palm oil through the creation of technology (Kushairi et al. 2017). Furthermore, Indonesia has already created Indonesia Palm Oil Association (IPOA) in 1981 to improve the domestic palm oil industry. Hence, the presence organization is positively correlated to palm oil downstream competitiveness.

Hypothesis 5 (H5). POIG is positive and significant on REC

Official exchange rate can be utilized as the payment for global trade, included palm oil product. Several empirical studies found that there is a negative effect toward trade (Rahman & Serletis, 2009; Pridayanti, 2013; Sugiharti et al. 2020). In case of palm oil downstream, it is also same with other commodity due to low value of official exchange rate implicates the enhancement of trade. Hence, this transmission can lead the higher competitiveness of palm oil downstream for both countries.

Hypothesis 6 (H6). OEXR is negative and significant on REC

We use the yearly time of trade in palm oil downstream export from (Food & Agriculture Organization (FAO), 2023), included the several commodities between 1971 to 2020. Furthermore, the data of GDP per capita,

foreign direct investment, and official exchange rate were obtained from (World Development Indicator 2022). The dummy AFTA was gathered from (ARIC ADB, 2022). The dummy of export duty between Indonesia and Malaysia were obtained from (GAPKI, 2017) and (Global Trade Alert, 2014). The dummy of palm oil organization was based from (BPDPKS 2018) for Indonesia and (MPOB, 2023) for Malaysia, respectively.

RESULTS

Table 1 showed the average of palm oil downstream export share between Indonesia and Malaysia to global market from 1971 until 2020. In Indonesia, the highest export share is Industrial monocarboxylic fatty acids; acid oils from refining (34.73%), followed by Food preparations n.e.c. (18.19%), Cocoa butter, fat, and oil (13.32%), Fat preparations n.e.c. (8.11%), and Margarine and shortening (8.11%). Furthermore, industrial monocarboxylic fatty acids; Tamarind oil from distillation is also a palm oil downstream product which has a high export share in Malaysia (29.35%), followed Food preparations n.e.c. (15.47%), hydrogenated oils and fats (13.89%), Cocoa butter, fat, and oil (11.57%), and Food preparations of flour, meal, or malt extract (7.54%). Industrial monocarboxylic fatty acids; acid oils from refining is only palm oil downstream product with above 50%, reached 64.08% from combination between Indonesia and Malaysia. Palm oil downstream export in both countries is only dominant in the export of certain downstream products, especially in oleochemical products. Figure 2 reveals the REC of palm oil downstream between Indonesia and Malaysia from 1971 to 2020. Malaysia has higher competitiveness in two long-periods: 1) from 1971 until 1997 and 2) 2000 until 2013. Indonesia has a higher competitiveness than Malaysia in three short-periods: 1) from 1998 to 1999, 2) from 2012 to 2013 and 3) from 2015 to 2020. The highest REC in Malaysia is 3.75 in 2014, while Indonesia is 4.20 in 2020. However, the development of Indonesia palm oil downstream trade rapidly growing with higher value in last two decades. Meanwhile, Malaysia palm oil downstream relatively stable over the period although there was no increase in the value of REC. The lower of Malaysia REC affected from the lower value of export in the global world, similar with case in fruit export in Indonesia (Pradipta & Firdaus, 2014).

Table 1. Average export share of palm oil downstream products from 1971 until 2020

Products	Indonesia	Malaysia	Indonesia and Malaysia
Animal or vegetable fats and oils and their fractions, chemically modified, except those hydrogenated, inter-esterified, re-esterified or elaidinized; inedible mixtures or preparations of animal or vegetable fats or oils	1.101%	1.414%	2.515%
Chocolate products nes	1.398%	3.391%	4.789%
Cocoa butter, fat and oil	13.316%	11.574%	24.889%
Cocoa powder and cake	5.426%	6.189%	11.614%
Degras	0.107%	0.000%	0.107%
Fat preparations n.e.c.	8.111%	5.757%	13.868%
Flours and meals of oil seeds or oleaginous fruits, except those of mustard	0.002%	0.088%	0.090%
Food preparations n.e.c.	18.186%	15.473%	33.659%
Food preparations of flour, meal or malt extract	1.320%	7.540%	8.860%
hydrogenated oils and fats	2.872%	13.885%	16.757%
Ice cream and other edible ice	0.589%	0.329%	0.918%
Industrial monocarboxylic fatty acids; acid oils from refining	34.729%	29.348%	64.077%
Margarine and shortening	8.023%	2.833%	10.856%
Mixes and doughs for the preparation of bakers' wares	0.089%	0.301%	0.390%
Sugar confectionery	3.629%	1.642%	5.272%
Uncooked pasta, not stuffed or otherwise prepared	0.634%	0.210%	0.844%
Vegetable waxes (other than triglycerides), whether or not refined or coloured	0.471%	0.026%	0.497%

Source: FAO (2023)
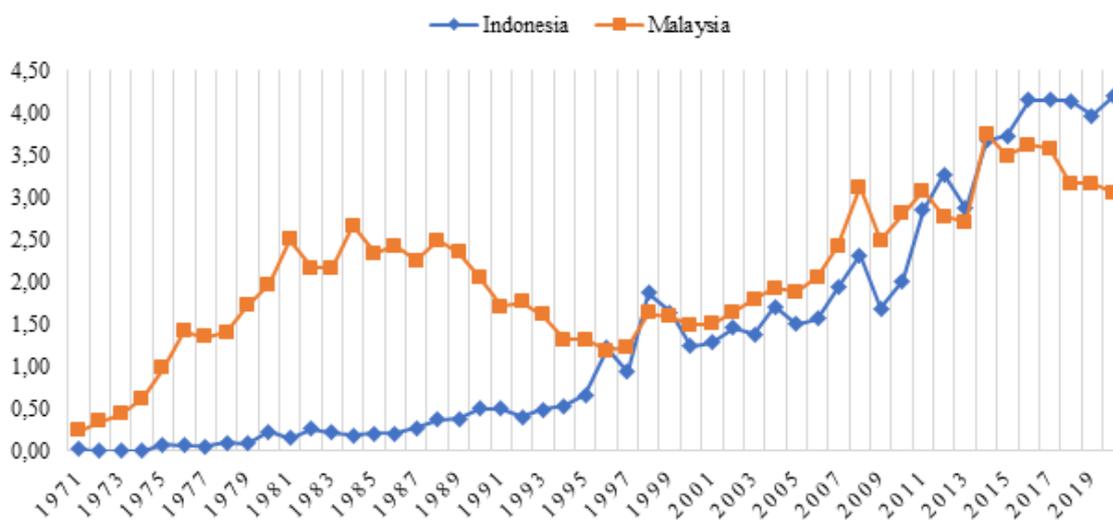
Figure 2. The REC of palm oil downstream between Indonesia and Malaysia (FAO, 2023)

Table 2 and Table 3 shows the value of REC in detail product of palm oil downstream, respectively. In Indonesia, the value of REC from 1971-1980 is below 1 with the highest and lowest values of REC are Cocoa powder and cake (0.569), and Animal or vegetable fats and oils and their fractions, chemically modified, except those hydrogenated, inter-esterified, re-esterified or elaidinized; inedible mixtures or preparations of animal or vegetable fats or oils (0.000), respectively.

The value of REC above 1 from 1981-1990 is only one product, revealed the highest REC is Industrial monocarboxylic fatty acids; acid oils from refining (2.275) and lowest REC is animal or vegetable fats and oils and their fractions, chemically modified, except those hydrogenated, inter-esterified, re-esterified or elaidinized; inedible mixtures or preparations of animal or vegetable fats or oils (0.013). In 1991-2000, there are five products with value of REC above 1. In

addition, the highest and lowest value of REC in this period are Industrial monocarboxylic fatty acids; acid oils from refining (7.857) and Mixes and doughs for the preparation of bakers' wares (0.013), respectively. Furthermore, six palm oil downstream products have a value of REC above 1. It is also revealing that the highest value is industrial monocarboxylic fatty acids; acid oils from refining (12.526), and the lowest value is fat preparations n.e.c. (0.061). In 2011-2020, there are nine products with value of REC above 1. The highest and lowest value of REC are fat preparations n.e.c. (13.685), and Mixes and doughs for the preparation of bakers' wares (0.097). Overall, there is an enhancement in amount of palm oil downstream product from 1971 until 2020. It is indicated that Indonesia palm oil downstream product has a growth from the competitiveness. Meanwhile, Malaysia has more product with value of REC above 1 than Indonesia based on Table 3. In 1971-1980, we found that there are four palm oil downstream products with value of REC above 1. The highest and lowest values of REC in this period are fat preparations n.e.c. (11.632), and vegetable waxes (other than triglycerides), whether or

not refined or coloured (0.029), respectively. There are six products with value of REC above 1 from 1981-1990, showing the highest REC is Industrial monocarboxylic fatty acids; acid oils from refining (24.106), and the lowest REC is Chocolate products nes and Vegetable waxes (other than triglycerides), whether or not refined or coloured (0.198). In 1991-2000, there is a decline in amount to only five products with the highest and lowest values of REC are Cocoa butter, fat, and oil (6.307), and Fat preparations n.e.c. (0.004), respectively. There are eight products with value of REC above 1 from 2001-2010. In this period, the highest value of REC is Industrial monocarboxylic fatty acids; acid oils from refining (23.865). Conversely, the lowest value of REC is Uncooked pasta, not stuffed or otherwise prepared (0.077). Furthermore, eight products have a REC value above 1 in 2011-2020 with the highest value is Industrial monocarboxylic fatty acids; acid oils from refining (20.253), and lowest value is Uncooked pasta, not stuffed or otherwise prepared (0.158). The amount of Malaysia palm oil downstream product with value of REC above 1 smaller than Indonesia but relatively stable during the period.

Table 2. The REC of Indonesia palm oil downstream, by specific product

Year	1971-1980	1981-1990	1991-2000	2001-2010	2011-2020
Animal or vegetable fats and oils and their fractions, chemically modified, except those hydrogenated, inter-esterified, re-esterified or elaidinized; inedible mixtures or preparations of animal or vegetable fats or oils	0.000	0.013	2.453	0.547	2.394
Chocolate products nes	0.003	0.076	0.228	0.242	0.182
Cocoa butter, fat and oil	0.092	0.693	4.504	7.015	13.044
Cocoa powder and cake	0.569	0.526	2.820	4.453	9.819
Degras	N/A	N/A	N/A	N/A	N/A
Fat preparations n.e.c.	0.002	0.056	0.060	0.061	13.685
Flours and meals of oil seeds or oleaginous fruits, except those of mustard	N/A	N/A	N/A	N/A	N/A
Food preparations n.e.c.	0.069	0.104	0.258	0.705	1.587
Food preparations of flour, meal or malt extract	N/A	N/A	0.871	0.867	0.707
hydrogenated oils and fats	N/A	N/A	N/A	N/A	N/A
Ice cream and other edible ice	N/A	N/A	0.056	0.183	0.917
Industrial monocarboxylic fatty acids; acid oils from refining	0.052	2.275	7.857	12.526	34.673
Margarine and shortening	0.010	0.511	3.292	11.652	11.338
Mixes and doughs for the preparation of bakers' wares	N/A	N/A	0.013	0.117	0.097
Sugar confectionery	0.004	0.132	0.918	1.230	1.218
Uncooked pasta, not stuffed or otherwise prepared	0.002	0.222	0.680	0.915	0.310
Vegetable waxes (other than triglycerides), whether or not refined or coloured	0.007	0.046	0.122	7.480	9.146

Source: FAO (2023)

Table 3. The REC of Malaysia palm oil downstream, by specific product

Year	1971-1980	1981-1990	1991-2000	2001-2010	2011-2020
Animal or vegetable fats and oils and their fractions, chemically modified, except those hydrogenated, inter-esterified, re-esterified or elaidinized; inedible mixtures or preparations of animal or vegetable fats or oils	0.270	1.240	0.247	1.163	3.062
Chocolate products nes	0.117	0.198	0.248	0.355	0.584
Cocoa butter, fat and oil	0.885	5.397	6.307	8.596	8.319
Cocoa powder and cake	0.495	2.371	3.847	7.356	9.543
Degras	N/A	N/A	N/A	N/A	N/A
Fat preparations n.e.c.	11.632	7.694	0.004	4.554	7.028
Flours and meals of oil seeds or oleaginous fruits, except those of mustard	N/A	N/A	N/A	N/A	N/A
Food preparations n.e.c.	0.326	0.825	0.544	0.685	1.266
Food preparations of flour, meal or malt extract	N/A	N/A	1.859	2.888	5.393
hydrogenated oils and fats	N/A	N/A	N/A	N/A	N/A
Ice cream and other edible ice	N/A	N/A	0.214	0.263	0.368
Industrial monocarboxylic fatty acids; acid oils from refining	5.811	24.106	17.788	23.865	20.253
Margarine and shortening	1.365	2.187	5.317	6.103	1.330
Mixes and doughs for the preparation of bakers' wares	N/A	N/A	0.081	0.282	0.401
Sugar confectionery	0.232	0.413	0.495	0.313	0.609
Uncooked pasta, not stuffed or otherwise prepared	2.172	0.725	0.122	0.077	0.158
Vegetable waxes (other than triglycerides), whether or not refined or coloured	0.029	0.198	0.120	1.016	0.319

Source: FAO (2023)

The estimation in our regression also carried out in this study. Table 4 shows the data of variable, containing mean, median, maximum, and minimum. In REC, there is a higher variation from the comparison between maximum and minimum values for both countries. Additionally, the data of FDI data from GDPC and FDI also varies over a wide range of values. Otherwise, other variables have a lower variation. Table 5 reveals the correlation matrix between independent variables in Indonesia and Malaysia, respectively. The result shows that there is no variable has a value higher than 0.8 or 0.9 following (Franke, 2010). It means that the independent variables in our model avoid multicollinearity. Thus, our model can be used for estimation without changing the regression model. Table 6 reveal the estimation of regression, containing several variables in our model. The result revealed some effect between variables between Indonesia and Malaysia. There are several variables affecting on REC in Indonesia, included the palm oil policy (POP), palm oil organization (POIG), and official exchange rates (LogOEXR) have a positive and significant effect. Compared to hypothesis, POP and POIG are accepted from our findings. The importance of palm oil policy in Indonesia can lead the decline toward palm oil export competitiveness (Rifin,

2010), improving the outcome of palm oil downstream. It can implicate the higher competitiveness of palm oil downstream through the restrictions of palm oil export as the raw material (Korinek & Kim, 2011).

Furthermore, It is also supported by the presence of IPOA as the palm oil organization in Indonesia to improve the research and development related on the palm oil downstream development (GAPKI, 2017). The enhancement of official exchange rate in case of palm oil downstream lead the positive improvement on its competitiveness, supported the previous result by (Lugo Arias et al. 2020) in crude or refined palm oil competitiveness. In Malaysia, there are more independent variables influencing on REC. GDP per capita (LogGDPC), and palm oil policy (POP) have a positive and significant effect toward Malaysia palm oil downstream REC, while foreign direct investment (FDI), and ASEAN free trade area (AFTA) are negative. The effect from GDP per capita is suitable with previous findings (Torok & Jambor 2016; Balogh & Jámbor, 2017). Similar with Indonesia case, the palm oil policy could drive the escalation of palm oil downstream competitiveness in Malaysia through export restriction. Surprisingly, FDI and AFTA have a

negative effect in case of Malaysia due to unbalance competition. The higher value of FDI can influence the industry composition depends on foreign firm, obstructed the national competitiveness. FDI is one of the essential determinants for economic growth through increasing capital flow, employment creation, increase in exports and technology transfer (Liang et al. 2021).

In AFTA, Indonesia is the main competitor of palm oil in Malaysia, implicating the involvement in AFTA in both countries can lead the fierce rivalry between them. Hence, The diversification the market into a non-traditional market must be considered for the export expansion commodity (Rindayati & Akbar, 2022), implicating the new free trade agreement for Malaysia.

Managerial Implications

There are several managerial implications, namely 1) Indonesia and Malaysia must consider the accurate policy related on palm oil downstream as the one of accelerator of competitiveness, 2) In Indonesia, policymakers must maintain the official exchange rate due to positive effect toward competitiveness, and 3) FDI in Malaysia must be controlled to maintain the competitiveness, while the participation of free trade agreement must be selective due to the presence of competitors who are members of it. Last but not least, the application of palm oil trade policy between two countries must be considered to increasing the value of export and implicates on the export competitiveness as a positive determinant.

Table 4. Descriptive statistics, Indonesia

Variable	Indonesia				Malaysia			
	Mean	Median	Maximum	Minimum	Mean	Median	Maximum	Minimum
Relative Export Competitiveness (REC)	1.337	0.806	4.195	0.000	2.057	2.013	3.753	0.242
GDP per capita (Log(GDPC))	6.761	6.626	8.331	4.368	8.120	8.207	9.318	5.997
Foreign direct investment (FDI)	1.210	1.230	4.241	-2.757	3.694	3.366	8.761	0.057
ASEAN free trade area (AFTA)	0.560	1.000	1.000	0.000	0.560	1.000	1.000	0.000
Palm oil policy (POP)	0.200	0.000	1.000	0.000	0.140	0.000	1.000	0.000
Palm oil organization (POIG)	0.120	0.000	1.000	0.000	0.420	0.000	1.000	0.000
Official exchange rates (LogOEXR)	7.971	7.739	9.588	5.971	1.097	1.036	1.459	0.778

Table 5. The matrix correlation between independent variables

Indonesia	Log(GDPC)	FDI	AFTA	POP	POIG	Log(OEXR)
Log(GDPC)	1.000					
FDI	0.115	1.000				
AFTA	0.770	0.039	1.000			
POP	0.716	0.326	0.443	1.000		
POIG	0.536	0.160	0.327	0.739	1.000	
Log(OEXR)	0.863	-0.066	0.884	0.556	0.447	1.000
Malaysia						
Log(GDPC)	1.000					
FDI	0.002	1.000				
AFTA	0.830	-0.049	1.000			
POP	0.514	-0.201	0.358	1.000		
POIG	0.781	-0.290	0.754	0.474	1.000	
Log(OEXR)	0.669	-0.271	0.775	0.552	0.816	1.000

Note: Relative Export Competitiveness(REC); GDP per capita (Log(GDPC));Foreign direct investment (FDI); ASEAN free trade area (AFTA); Palm oil policy (POP); Palm oil organization (POIG); Official exchange rates (LogOEXR)

Table 6. Multiple regression

Variable	Indonesia			Malaysia		
	Coefficient	Std. Error	Prob.	Coefficient	Std. Error	Prob.
Constant	-3.206***	0.505	0.000	-7.202***	1.056	0.000
GDP per capita (Log(GDPC))	0.035	0.080	0.663	1.262***	0.117	0.000
Foreign direct investment (FDI)	0.058	0.030	0.060	-0.073**	0.029	0.016
ASEAN free trade area (AFTA)	0.229	0.154	0.144	-1.437***	0.204	0.000
Palm oil policy (POP)	1.393***	0.164	0.000	0.520***	0.172	0.004
Palm oil organization (POIG)	0.782***	0.155	0.000	0.101	0.196	0.608
Official exchange rates (LogOEXR)	0.469***	0.077	0.000	-0.025	0.461	0.957
F-Statistics	264.675***		0.000	55.795***		0.000
R-Squared	0.974			0.886		
Adjusted R-Squared	0.970			0.870		
Durbin-Watson	1.686			1.405		
Observation (N)	50			50		

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study aims to examine the REC of palm oil downstream between Indonesia and Malaysia by describing the value of REC and determining the main factors. The utilization of data in this study is time series from 1970 until 2021. The result shows that REC in Indonesia is higher than Malaysia in last two decades. Malaysia REC is dominant than Indonesia REC in early period, especially in 1971 until 1997. Our regression reveals that REC in Indonesia affected positively by palm oil policy, the presence of palm oil organization, and official exchange rate. Hence, Indonesia must consider these variables as the essential factor to improve the competitiveness, especially palm oil policy as the most-influential factor. On the other hand, there are positive effect from GDP per capita and palm oil policy on Malaysia REC. Otherwise, FDI and AFTA have a negative effect. Differ with Indonesia, the improvement of competitiveness in Malaysia can be implemented by focusing in domestic factor, particularly in GDP per capita as the highest impact on competitiveness. This result also similar with previous study due to determinant factor of REC relatively come from economic variable.

Recommendations

Indonesia and Malaysia must increase the value of export of palm oil downstream to compete in global market, indicated from the high value of relative export competitiveness. The policymaker can maintain and continue developing the export by diversifying on non-traditional market to increase the value of export. There are several factors influencing on relative export competitiveness between two countries, implicated the different recommendation. In Indonesia, palm oil policy is the important factor to increasing the competitiveness as a highest coefficient value. Conversely, GDP per capita must be considered due to highest impact on competitiveness in Malaysia.

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