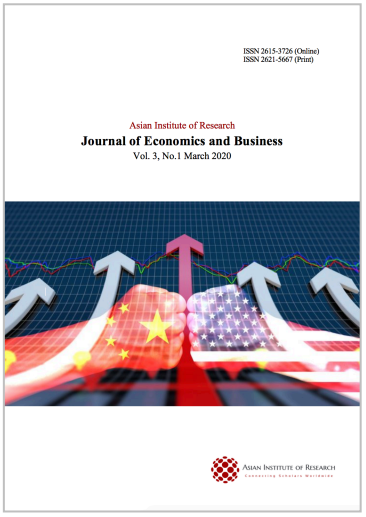

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The Difference in Competitiveness of Indonesian Biodiesel between Spain and the EU

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Abstract
The purpose of this paper is to find the competitiveness of Indonesia's biodiesel exports in the Spanish and the European Union (EU) market as a whole using some competitiveness analysis approaches. In addition to knowing the similarities and differences in the results of the methods of analyzing the competitiveness of Indonesian biodiesel in Spain and the EU. The methodology used was comparative advantage analysis, including analysis of RCA, RSCA, and NRCA and market share. The data used are the value of biodiesel and total monthly exports of both Indonesia and other countries to Spain and the EU from January 2012 to January 2019. Through the market share approach, it was known that Indonesia's biodiesel market share in the Spanish and EU markets was only 22 percent and 0.04, respectively with an increasing trend in Spain and a decreasing trend in the EU. Each method for measuring competitiveness shows the similarity of results. Indonesia's biodiesel had competitiveness, both in Spain and the EU. Indonesia's biodiesel competitiveness trends are declining of all methods, both in the Spanish and EU markets, except the RCA method for Spain. Indonesia's biodiesel competitiveness is relatively better in Spain than the EU. The originality that there was not paper on the theme of the comparative competitiveness of Indonesia's biodiesel exports in Spain and the EU. This paper also proposes new criteria for determining competitiveness using existing competitiveness analysis methods. This can be input to determine better steps in marketing Indonesian biodiesel to Spain and the EU.

Keywords: Bioenergy, Comparative Advantage, Market Share, Symmetric, Normalized, Monthly, Ultimate; Extreme, Weak, Strong

1. Introduction

Bioenergy is a renewable energy that increases energy security (Vega-quezada et al., 2016). Biodiesel is one type of bioenergy that is increasingly known lately. Because of its advantages compared to fossil energy sources, especially more friendlies to the environment, making biodiesel can be a good alternative energy source to overcome greenhouse gases that trigger global warming (Prapaspongsa & Gheewala, 2017).

Many countries are involved in biodiesel trade. Biodiesel is needed in all regions of the world, one of which is the EU. Compared to other regions, biodiesel exports to the EU with the HS code for 382600 biodiesels are greater than in other regions in the world. Based on data from the ITC (2020), EU biodiesel imports in 2018 are 84 percent of world imports as a whole. Biodiesel imports of the EU in 2018 amounted to 11,834.282 million USD.

Spain is an importer of biodiesel importers in the EU. The overall value of Spanish biodiesel imports in 2018 amounted to 1,299.881 million USD. This import value is quite large when compared to many other biodiesels importing countries in the EU except the Netherlands and Belgium.

Indonesia is one of the world's biodiesel exporters that exports to the EU. One of the marketing areas is Spain. Compared among many destination countries for Indonesia's biodiesel exports in the EU, and even Europe in general. Spain is Indonesia's main biodiesel marketing destination. The value of Indonesia's biodiesel exports in Spain reached 362,337 million USD.

Competitiveness can be used to make certain policies (Muzayyin et al., 2019). This paper aims to determine the market share and competitiveness of Indonesian biodiesel in Spain when compared to the EU using several analytical methods, so it is known that the possible similarity of the results leads to increased confidence in the level of competitiveness of Indonesian biodiesel in the Spanish and the EU market.

2. Biodiesel in the EU

Biodiesel is a liquid fuel in addition to bioethanol which is used to fuel transportation and can increase energy security in the EU. It is planned that each EU country uses 10% of renewable energy, including biodiesel (European Commission, 2014).

EU Biodiesel consumption has increased in Europeans, including the EU. Biodiesel production in the EU uses the main raw material of rapeseed (EUBIA, 2020).

3. Previous research and novelty

Many writers raised the material on biodiesel exports, but only a few authors wrote the competitiveness of biodiesel. Dewanta et al. (2016) concerning the elasticity and competitiveness of the Indonesian commodity in the Indian market but commodity was palm oil and Pambudi et al. (2019) concerning the determinants of biodiesel exports in Indonesia, and no writings were found that wrote the competitiveness of Indonesia's biodiesel exports on the Spanish or EU markets. So be convinced that this paper is different from previous papers. Data analysis used is monthly data, where most authors use annual data.

4. Methodology

Competitiveness in this paper was measured using comparative advantage and market share (MS). To conduct an investigation of comparative advantage using RCA (Revealed Comparative Advantage) analysis, RSCA (Revealed Symmetric Comparative Advantage), and NRCA (Normalized Revealed Comparative Advantage). Some analyzes were used with the intention that the results obtained are more reliable. By comparing the results of one analysis with another, a better conclusion will be obtained. The analysis were written as follows.

4.1 RCA analysis

Balassa RCA Analysis (1965) was used to measure the competitiveness of exports of biodiesel Indonesia, in this paper follows the equation which was also used by Kathuria (2013) in his paper wes rewritten as follows:

$RCA_{ijk} = (X_{ijk}/X_{wjk})/(X_{ij}/X_{wj})$

X showed the value of exports, Indonesia as an exporter of biodiesel in this paper was symbolized by *i*, an export destination with *j*, commodity (biodiesel) with *k*, and the world with *w*.

If the RCA index was more than 1, it would mean that there was a comparative advantage or competitiveness. To interpret the results more thoroughly, the determination of results can be used according to Erkan & Yildirimci (2015) sourced from Hinloopen & Marrewijk (2001) with an expanded classification, Classification 5 and 6 as shown in Table 1.

Table 1 Determination of RCA analysis results

Categories	RCA value	Interpretation
Classification 1	$0 < RCA \leq 1$	There was no competitiveness
Classification 2	$1 < RCA \leq 2$	There was a weak competitiveness
Classification 3	$2 < RCA \leq 4$	There was a medium competitiveness
Classification 4	$4 < RCA \leq 8$	There was a strong competitiveness
Classification 5	$RCA > 8$	There was an extreme competitiveness

Source: Hinloopen & Marrewijk (2001); Erkan & Yildirimci (2015).

4.2 RSCA analysis

The RSCA analysis proposed by Dalum et al. (1998) was a refinement of the Balassa RCA analysis. The RSCA analysis follows the equation written by Van Hoang et al. (2017) as follows:

$$RSCA_{ijk} = (RCA_{ijk} - 1)/(RCA_{ijk} + 1)$$

The results of the RSCA analysis were between -1 and +1, avoiding the zero value problem (Hoang et al., 2017). The determination of RSCA results can be seen in the following Table 2:

Table 2 Determination of RSCA analysis results

Categories	RSCA value	Interpretation
Classification 1	$-1 \leq RSCA < 0$	There was no competitiveness
Classification 2	$0 = RSCA$	Neutral
Classification 3	$0 < RSCA \leq 1$	There was a competitiveness

Source: Hoang et al. (2017) expanded.

4.3 NRCA analysis

NRCA analysis was first proposed by Yu et al. (2009). According to Hoang et al. (2017), NRCA analysis was one alternative and improvement of the Balassa RCA analysis. NRCA was symmetrical because it produces a value between -0.25 to +0.25 with a value of 0 as the midpoint/balance between the two values. The NRCA equation was as follows:

$$NRCA_{ijk} = (X_{ijk}/X_{wj}) - (X_{ij}X_{wjk}/X_{wk}X_{wk})$$

The determination of the results of NRCA analysis can be seen in Table 3.

Table 3 Determination of NRCA analysis results

Categories	NRCA value	Interpretation
Classification 1	$-0.25 \leq NRCA < 0$	There was no competitiveness
Classification 2	$0 = NRCA$	Neutral
Classification 3	$0 < NRCA \leq 0.25$	There was a competitiveness

Source: Hoang et al. (2017) expanded.

4.4 MS analysis

Market share is the percentage of a market in units or revenue recorded by a particular entity (Wikipedia, 2012). Han et al. (2009) wrote MS as follow:

$MS_{ijk} = X_{ijk}/X_{iw}$

MS_{ijk} was the Indonesian biodiesel market to the destination.

5. Result

5.1 RCA index

The results of the analysis of the competitiveness of Indonesian biodiesel in the Spanish and EU markets using the RCA analysis method were displayed in the form of Fig. 1 and Table 4.

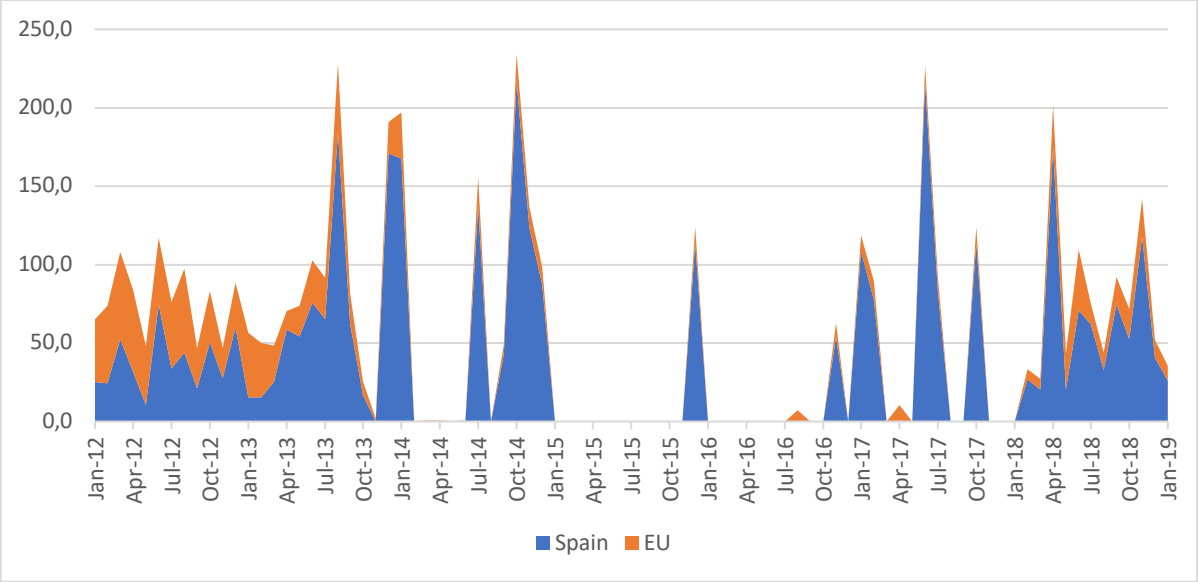

Fig. 1 Indonesia's biodiesel comparative advantage in the Spanish and the EU market using the RCA index from January 2012 till January 2019 (Source: own calculation based on ITC data, 2019).

Table 4 Comparison of comparative advantage of Indonesian biodiesel in the Spanish and the EU market using the RCA index from 2012 till 2018.

Year	RCA index	
	The Spanish market	**The EU market**
2012	38.0 (Ultimate competitiveness)	39.8 (Ultimate competitiveness)
2013	62.0 (Ultimate competitiveness)	23.1 (Ultimate competitiveness)
2014	64.6 (Ultimate competitiveness)	8.2 (Extreme competitiveness)
2015	9.4 (Extreme competitiveness)	1.0 (Weak competitiveness)
2016	4.5 (Strong competitiveness)	1.3 (Weak competitiveness)
2017	49.9 (Ultimate competitiveness)	5.2 (Strong competitiveness)
2018	57.8 (Ultimate competitiveness)	16.6 (Ultimate competitiveness)
Average	**40.9 (**Ultimate competitiveness)	**13.6 (**Extreme compete)tiveness
Trend	**Strengthen up**	**Weakened**

Source: own calculation based on ITC data (2019).

5.2 RSCA index

The results of the analysis of the competitiveness of Indonesian biodiesel in the Spanish and EU markets using the RSCA analysis method were displayed in the form of Fig. 2 and Table 5.

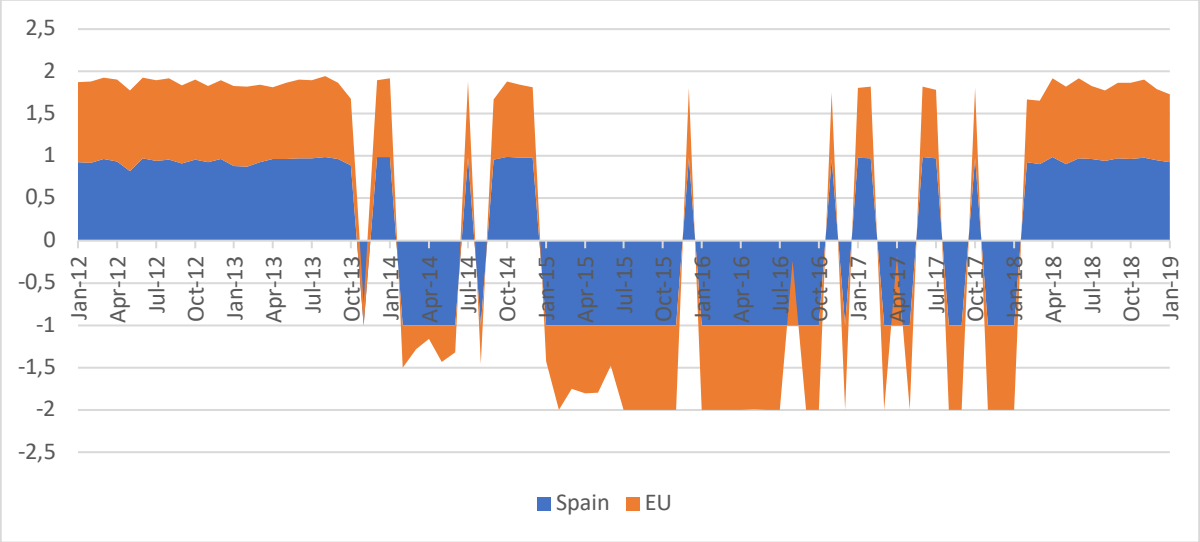

Fig. 2 Indonesia's biodiesel comparative advantage in the Spanish and the EU market using RSCA index from January 2012 till January 2019 (Source: own calculation based on ITC data, 2019).

Table 5 Comparison of comparative advantage of Indonesian biodiesel in the Spanish and the EU market using RSCA index from 2012 till 2018

Year	RSCA index	
	The Spanish market	**The EU market**
2012	0.93 (Strong competitiveness)	0.95 (Strong competitiveness)
2013	0.78 (Strong competitiveness)	0.85 (Strong competitiveness)
2014	-0.01 (No competitiveness)	0.25 (Weak competitiveness)
2015	-0.83 (No competitiveness)	-0.70 (No competitiveness)
2016	-0.84 (No competitiveness)	-0.70 (No competitiveness)
2017	-0.17 (No competitiveness)	-0.09 (No competitiveness)
2018	0.79 (Strong competitiveness)	0.71 (Strong competitiveness)
Average	**0.09 (Weak competitiveness)**	**0.18 (Weak competitiveness)**
Trend	**Weakened**	**Weakened**

Source: own calculation based on ITC data (2019).

5.3 NRCA index

The results of the analysis of the competitiveness of Indonesian biodiesel in the Spanish and EU markets using the NRCA analysis method were displayed in the form of Fig. 3 and Table 6.

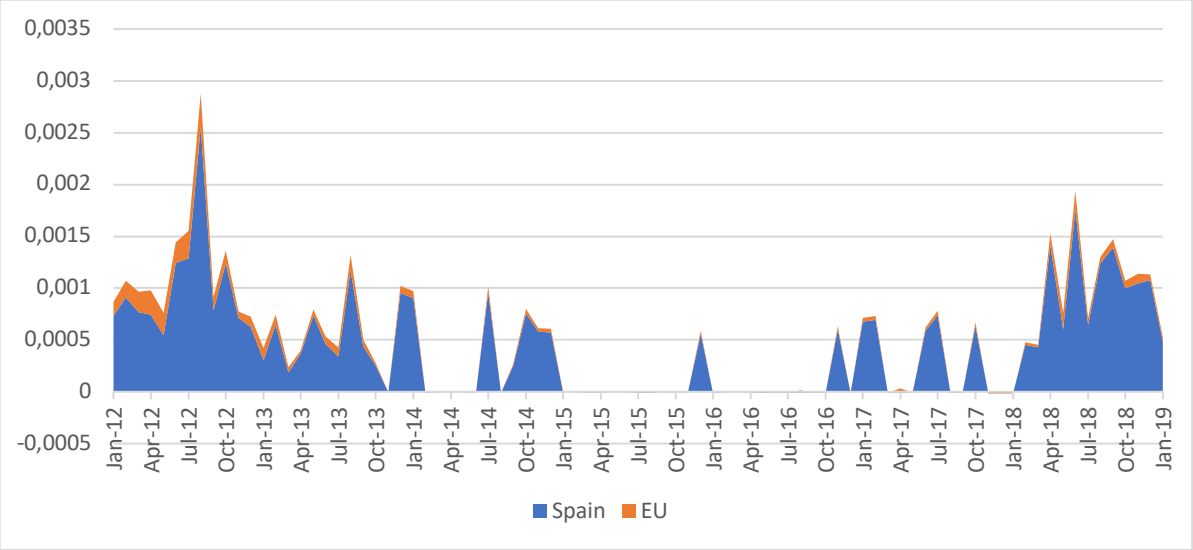

Fig. 3 Indonesia's biodiesel comparative advantage in the Spanish and the EU market using the NRCA index from January 2012 till January 2019 (Source: own calculation based on ITC data, 2019).

Table 6 Comparison of comparative advantage of Indonesian biodiesel in the Spanish and the EU market using NRCA index from 2012 till 2018

Year	NRCA index	
	The Spanish market	The EU market
2012	0.0010121 (Weak competitiveness)	0.0001781 (Weak competitiveness)
2013	0.0004878 (Weak competitiveness)	0.0000685 (Weak competitiveness)
2014	0.0003328 (Weak competitiveness)	0.0000193 (Weak competitiveness)
2015	0.0000423 (Weak competitiveness)	0.0000003 (Weak competitiveness)
2016	0.0000436 (Weak competitiveness)	0.0000021 (Weak competitiveness)
2017	0.0002718 (Weak competitiveness)	0.0000168 (Weak competitiveness)
2018	0.0009192 (Weak competitiveness)	0.0000783 (Weak competitiveness)
Average	**0.0004428 (Weak competitiveness)**	**0.0000519 (Weak competitiveness)**
Trend	**Weakened**	**Weakened**

Source: own calculation based on ITC data (2019).

5.4 MS

The movement of the monthly market share and the magnitude of Indonesia's biodiesel annual market share can be seen in Fig. 4 and Table 7.

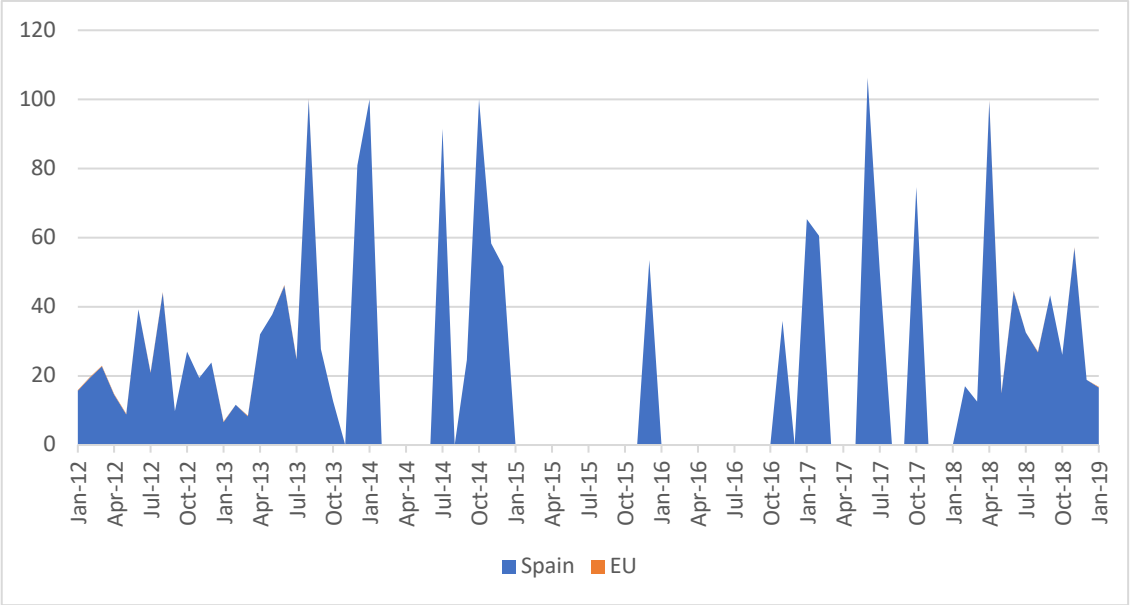

Fig. 4 Market shares of Indonesian biodiesel in the Spanish and the EU market from January 2012 till January 2019 (Source: own calculation based on ITC data, 2019).

Table 7 Summary of the market share of Indonesian biodiesel in the Spanish and the EU market from 2012 till 2018

Year	MS	
	The Spanish market	The EU market
2012	22.121	0.123
2013	32.389	0.067
2014	35.499	0.023
2015	4.455	0.003
2016	2.997	0.004
2017	29.740	0.015
2018	32.794	0.043
Average	**22.286**	**0.040**
Trend	**Increase**	**Decrease**

Source: own calculation based on ITC data (2019).

6. Discussion

6.1 Indonesia's biodiesel exports to Spain compared to other countries in the EU

Fluctuations in Indonesia's biodiesel exports to all countries in the world compared to the EU and Spain have a similar pattern. The percentage of Indonesia's biodiesel exports to Spain against the EU from January 2012 to January 2019 was 76.6 percent. There are several months that all of Indonesia's biodiesel exports to Spain compared to the EU are 100 percent, namely in October and December 2014, December 2015, November 2016, January, February, June, July, October 2017, February, March, September, and December 2018. This shows that Spain is the main destination country for Indonesia's biodiesel exports in the EU (see Fig. 5).

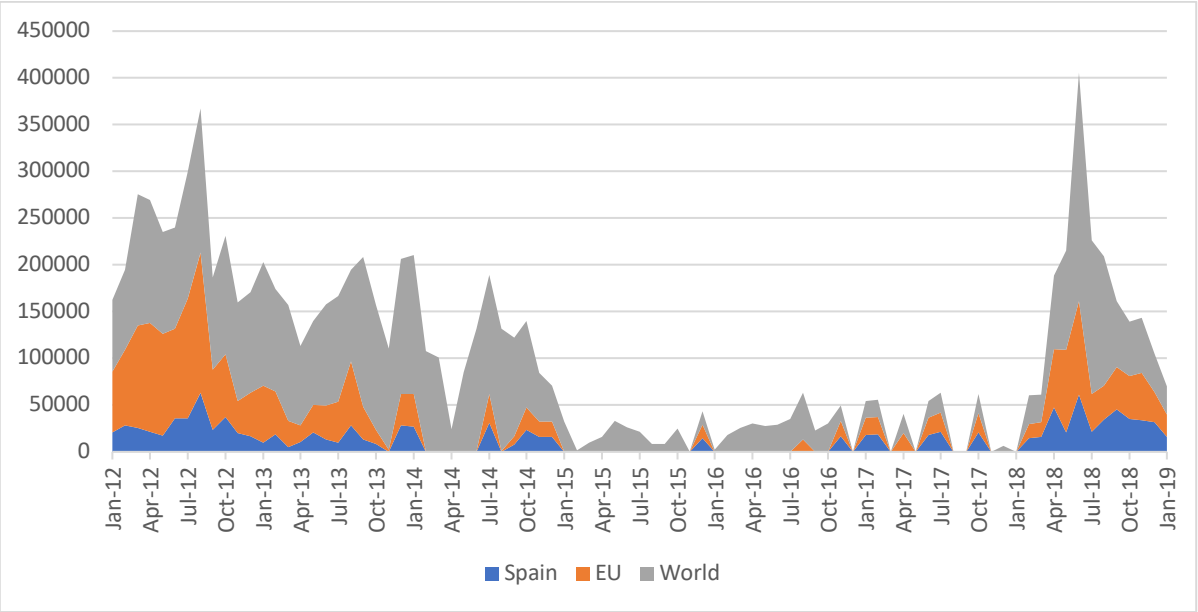

Fig. 5 The value of Indonesia's biodiesel exports to Spain is compared to the EU and the world (Source: own calculation based on ITC data, 2019).

Table 8 shows the 5 destination countries for Indonesia's biodiesel exports in the EU. The rating shows the number of exports expressed in percent. The difference between the top rankings (Spain) and last (Germany) and the average ranking below them are 65,361 percent and 57,155 percent respectively, making Spain very prominent as Indonesia's biodiesel market in the EU. In addition to the large percentage of exports, Indonesia's biodiesel export continuity is also maintained year after year.

Table 8 Percentage of Indonesia's biodiesel exports to Spain compared to other EU countries (Italy, Germany, the Netherlands, and Belgium) of Indonesia's biodiesel exports to the EU

Year	Spain (%)	Italy (%)	Netherlands (%)	Belgium (%)	Germany (%)
2012	32.478	29.173	36.584	1.032	0.085
2013	40.109	23.822	35.167	0.062	0.840
2014	90.262	0.000	8.253	0.000	1.485
2015	91.077	0.000	5.997	2.926	0.000
2016	55.268	44.708	0.000	0.007	0.000
2017	82.696	17.304	0.000	0.000	0.000
2018	68.044	5.339	22.780	3.837	0.000
Average	**65.705**	**17.192**	**15.540**	**1.123**	**0.344**
Rank	**1**	**2**	**3**	**4**	**5**
Trend	**Increase**	**Decrease**	**Decrease**	**Increase**	**Decrease/lose**

Source: own calculation based on ITC data (2019).

6.2 Indonesia's biodiesel market share in the Spanish and EU markets

One of the uses of market share analysis is that business managers can measure the performance of a product or commodity in the market place (Cooper, 1988). The average market share of Indonesian biodiesel from January 2012 to January 2019 on the Spanish and EU markets was 22,784 percent and 0.040 percent, respectively. The largest monthly market share in Spain reached 100 percent, namely in August 2013 and July 2017, while the smallest reached 6.669 percent and even Indonesia biodiesel has lost its market share several times including in November 2013, February-June 2014, August 2014, January-November 2015, January-October 2016, December 2016, March-May 2017, August-September 2017, November 2017-January 2018. Indonesia's highest biodiesel market share in the EU only reached 0.169 percent, which occurred in August 2012, while the lowest reached

0.000012 percent even as in Spain lost its market share occurred in February 2015, July-November 2015, January-April 2016, June-July 2016, September-October 2016, December 2016, March 2017, May 2017, August-September 2017, November - December 2017, January 2018 (Fig. 4).

Thus, it can be seen that the calculation of the monthly market share is different from the annual (see Table 7). The largest and smallest monthly and annual market share of Indonesia's biodiesel in Spain is 64.501 percent and 3,672 percent, respectively (not taking into account the absence of market share). The largest and smallest monthly and annual market share differences in Indonesian biodiesel in the EU are 0.046 percent and -0.030 percent, respectively (not taking into account the lack of market share).

There seems to be a vast difference in Indonesia's biodiesel market share in Spain when compared to the EU. The average market share of Indonesia's biodiesel in Spain is relatively much higher compared to the EU. In addition to the large market share, market share trends are also different. The magnitude and trend of Indonesia's biodiesel market share which is increasing in Spain is an expectation that Indonesian biodiesel will be able to be marketed better in Spain. However, the relatively small market share and the downward trend in Indonesia's biodiesel market share in the EU market as a whole is a sign of the unfavorable marketing of Indonesia's biodiesel on the EU market. This is in line with the fact that the marketing of Indonesia's biodiesel to the EU is experiencing many obstacles.

Regarding the movement of Indonesia's biodiesel market share in both the Spanish and EU markets can be seen in Fig. 4. There is no visible movement in the EU market share because the market share is relatively very small when compared to market share in Spain. The loss of market share was due to unrecorded biodiesel exports to Spain during that period.

6.3 The comparative advantages of Indonesian biodiesel on the Spanish and EU markets

6.3.1 Measured competitiveness using the RCA index

Overall from January 2012 to January 2019, the average RCA index of Indonesian biodiesel on the Spanish and EU markets was 32,289 and 13,557, respectively. This means that the average competitiveness of Indonesia's biodiesel on the Spanish market was ranked ultimately, while in the EU market it was ranked extremely. This showed that according to the RCA analysis, both in the Spanish market in particular and the EU in general Indonesian biodiesel had quite a good competitiveness.

6.3.1.1 The competitiveness of Indonesian biodiesel in Spain according to the RCA analysis

The competitiveness of Indonesian biodiesel in Spain according to analysis fluctuated from month to month, wherefrom January 2012 to January 2019, the best gains in competitiveness marked by the highest RCA index (RCA index 216,945) were found in October 2014 and the worst (RCA index 10,313) occurred in May 2012. This means that Indonesia's biodiesel competitiveness was in a condition between the extreme and ultimate level.

From January 2012 to October 2013 in a row, Indonesia's biodiesel gained competitiveness and was in quite a good condition, at least at extreme levels. After that, there was a change in conditions between the acquisition of competitiveness and loss of competitiveness, but if there was a gain of competitiveness, the minimum level was ultimate. Indonesia also lost its competitiveness in the longest period, from January to November 2015. Sustainable competitiveness was again achieved by Indonesian biodiesel, namely from February 2018 to January 2019 with conditions at least at the ultimate level. Based on the RCA analysis which is conducted monthly by looking at the beginning and end of the analysis period (January 2012 and January 2019) shows that there is a tendency to strengthen the competitiveness of Indonesian biodiesel in Spain. Fluctuations in the movement of the RCA index of Indonesian biodiesel in Spain every month can be seen in Fig. 1.

The annual difference between the RCA indexes of Indonesian biodiesel in Spain from 2012 to 2018 was between the highest and the lowest quite large, which is 60.1. During this period, Indonesian biodiesel in Spain gained

competitiveness. Indonesia's biodiesel competitiveness in Spain was at least in a strong position. The strength of competitiveness fluctuated but the tendency strengthened. More details about this can be seen in Table 4.

6.3.1.2 The competitiveness of Indonesian biodiesel in the EU according to the RCA analysis

Fluctuations in Indonesia's biodiesel competitiveness in the EU occur from month to month, wherefrom January 2012 to January 2019, Indonesian biodiesel in the EU reached the highest degree of competitiveness marked by the highest RCA index (RCA index 55,448) occurred in March 2012 and the worst being marked with the lowest RCA index (1,722 RCA index) occurred in November 2013. This means that from January 2012 to January 2014 respectively, Indonesian biodiesel gained competitiveness with the ultimate majority level even though some were at a weak level (occurring in November 2013).

After that, there is a change in conditions between the acquisition of competitiveness and loss of competitiveness, but in the event of the acquisition of competitiveness the minimum level of competitiveness is strong. Indonesia lost consecutive competitiveness with the longest period from January to November 2015. Indonesia's biodiesel in the EU regained its sustainable competitiveness from February 2018 to January 2019 with minimal conditions at strong levels. Based on the RCA analysis which is conducted monthly by looking at the beginning and end of the analysis period (January 2012 and January 2019) shows that there is a tendency to weaken the competitiveness of Indonesian biodiesel in the EU. Fluctuations in the movement of the RCA index of Indonesian biodiesel in the EU every month can be seen in Fig. 1.

Throughout 2012 to 2018 there was always a gain in competitiveness, except for 2015. The difference between the annual Indonesian RCA biodiesel index in the EU from 2012 to 2018 between the highest and lowest was also quite large, amounting to 38.8. If Indonesian biodiesel in the EU gains competitiveness, it is at least in a weak position. Competitiveness strength fluctuates but tends to weaken (see Table 4).

6.3.2 Measured competitiveness using the RSCA index

Overall from January 2012 to January 2019, the average RSCA index of Indonesian biodiesel on the Spanish and EU markets was 0.1028 and 0.1878, respectively. This means that Indonesian biodiesel, both in the Spanish and EU markets are equally competitive despite being weak. The competitiveness of Indonesian biodiesel in Spain is slightly weaker than in the EU.

6.3.2.1 Indonesia's biodiesel competitiveness in Spain according to the RSCA index

The competitiveness of Indonesia's biodiesel in Spain also fluctuates from month to month. From January 2012 to January 2019, based on the RSCA index, the best competitiveness was marked by the highest RSCA index (RSCA index 0.990823) in October 2014 and the worst was marked by the lowest RSCA index (RSCA index 0.82321) in May 2012. This means that Indonesia's biodiesel competitiveness in Spain is at a strong level. Overall, if there is a gain in competitiveness, then it is at a strong level.

From January 2012 to October 2013 in a row, Indonesia's biodiesel gained competitiveness. After that there is a change in conditions between the acquisition of competitiveness and loss of competitiveness. Biodiesel Indonesia had lost its competitiveness in the longest period, ie from January to November 2015. The acquisition of sustainable competitiveness again occurred from February 2018 to January 2019. Based on the RSCA analysis which is conducted monthly by looking at the beginning and end of the analysis period (January 2012 and January 2019) shows that there is a tendency to strengthen the competitiveness of Indonesian biodiesel in Spain, although it is relatively very small. Fluctuations in the movement of the RSCA index of Indonesian biodiesel in Spain every month can be seen in Fig. 2.

The annual RSCA biodiesel index difference in Indonesia in Spain from 2012 to 2018 is between the highest and the lowest quite large, which is 0.94 (almost close to +1). If you gain competitiveness, Indonesian biodiesel in Spain is also in a very strong position. Between 2014 and 2017, Indonesia's biodiesel lost its competitiveness and

when viewed from the beginning and end of the period, there was a tendency to experience a weakening of competitiveness. Regarding this matter can be seen in Table 5.

6.3.2.2 Indonesia's biodiesel competitiveness in the EU according to the RSCA index

Starting from January 2012 to January 2019, Indonesia's biodiesel competitiveness has fluctuated from month to month. In Indonesia's biodiesel exports to the EU, the best gains in competitiveness marked by the highest RSCA index (RSCA index 0.9646) occurred in March 2012 and the worst marked by the lowest RSCA index (RSCA index 0.2652) occurred in November 2013. This shows that biodiesel Indonesia in the EU market is at a level between weak to strong.

By looking at the RSCA index, from January 2012 to January 2014 Indonesian biodiesel in the EU gained successive competitiveness even though some were at a weak level, namely in November 2013 (the rest were at strong levels). After that, there is a change in conditions between the acquisition of competitiveness and loss of competitiveness, but in the event of the acquisition of competitiveness, the level of minimum competitiveness is strong. Indonesia also lost its competitiveness in the longest period from January 2015 to November 2015. The acquisition of sustainable competitiveness again occurred from February 2018 to January 2019 with minimal conditions at a strong level. Based on the RSCA analysis which is conducted monthly by looking at the beginning and end of the analysis period (January 2012 and January 2019) shows that there is a tendency to weaken the competitiveness of Indonesia's biodiesel in the EU. Fluctuations in the movement of Indonesian biodiesel in the EU based on the RSCA index every month can be seen in Fig. 2.

The annual RSCA biodiesel index difference in Indonesia in Spain from 2012 to 2018 between the highest and lowest is also quite large, which is 1.65. If Indonesian biodiesel in the EU gains minimal competitiveness, it will be in a weak position. Competitiveness strength fluctuates but tends to weaken (see Table 5).

6.3.3 Measured competitiveness using the NRCA index

Overall from January 2012 to January 2019, the average NRCA index of Indonesian biodiesel on the Spanish and EU markets was 0.000444 and 0.000052, respectively. This means that Indonesian biodiesel, both in the Spanish and EU markets are equally competitive despite being weak. The competitiveness of Indonesian biodiesel in Spain is stronger when compared to the EU.

6.3.3.1 The competitiveness of Indonesian biodiesel in Spain according to the NRCA index

Based on NRCA analysis, the competitiveness of Indonesian biodiesel in Spain has fluctuated from month to month. From January 2012 to January 2019, the best competitiveness which was marked by the highest NRCA index (NRCA index 0.002551) occurred in August 2012 and the worst marked by the lowest NRCA index (NRCA index 0.0001855) occurred in March 2013. This means that the competitiveness of Indonesia's biodiesel in Spain is at a weak level. Overall, if there is a gain in competitiveness, then it is at a weak level.

Between the period of January 2012 and October 2013, from the results of successive NRCA analyzes, Indonesian biodiesel gained competitiveness at a weak level. After that, there is a change in conditions between the acquisition of competitiveness and loss of competitiveness. Biodiesel Indonesia had lost its competitiveness in the longest period, namely from January to November 2015. The acquisition of sustainable competitiveness again occurred from February 2018 to January 2019. Based on the NRCA analysis which is conducted monthly by looking at the beginning and end of the analysis period (January 2012 and January 2019) shows that there is a tendency to weaken the competitiveness of Indonesian biodiesel in Spain. Fluctuations in competitiveness (movement of NRCA index) of Indonesian biodiesel in Spain every month can be seen in Fig. 3.

The annual NRCA biodiesel index difference in Spain from 2012 to 2018 is the highest with the lowest reaching 0.0009698. Biodiesel Indonesia gained competitiveness in the Spanish market during this period, but was in a weak position. Competitiveness tends to weaken. Regarding this condition can be seen in Table 6.

6.3.3.2 Indonesia's biodiesel competitiveness in the EU according to the NRCA index

Fluctuations in Indonesia's biodiesel competitiveness occur from month to month. From January 2012 to January 2019, there was Indonesia's biodiesel exports to the EU, the highest competitiveness was equal to RCA, namely in August 2012 with an NRCA index of 0.0003254, but the lowest was the same as the RSCA, which occurred in November 2013 with the NRCA index of 0.00000202. This means that each is at a low level of competitiveness.

Similar to the RCA and RSCA, based on NRCA analysis from January 2012 to January 2014 successively showed that Indonesia's biodiesel gained competitiveness despite all being at a weak level. After that, there is a change in conditions between the acquisition of competitiveness and the loss of competitiveness, and if the acquisition of competitiveness occurs the level of competitiveness is weak. Biodiesel Indonesia lost competitiveness in the longest period from January 2015 to November 2015. The acquisition of sustainable competitiveness again occurred from February 2018 to January 2019 with the condition of competitiveness at strong levels. Based on the NRCA analysis which is conducted monthly by looking at the beginning and end of the analysis period (January 2012 and January 2019) shows that there is a tendency to weaken the competitiveness of Indonesian biodiesel in the EU. Fluctuation in competitiveness (movement of NRCA index) of Indonesian biodiesel in the EU every month can be seen in Fig. 3.

From 2012 to 2018, Indonesian biodiesel in the EU gained competitiveness although it was weak. The annual NRCA biodiesel index difference in the EU from 2012 to 2018 between the highest and lowest is also quite large, which is equal to 0.0001778. The strength of competitiveness of Indonesian biodiesel in the EU is fluctuating, however, the tendency for competitiveness is weakening (see Table 6).

7 Conclusion and policy implication

Biodiesel Indonesia has a market share, both in Spain and in the EU. The average market share of Indonesian biodiesel in Spain is greater than in the EU in general. Market share in Spain is special because it only covers one country in the EU, while the market share in the EU besides Spain includes several other countries, including Germany, Italy, the Netherlands, and Belgium. It can be seen that Indonesia's biodiesel market share in other EU countries is no better than the market share in Spain. Indonesia's biodiesel market share even looks likely to improve when compared to the EU which tends not to improve.

It was known that Indonesia's biodiesel market share in the Spanish and EU markets was only 22 percent and 0.04, respectively with an increasing trend in Spain and a decreasing trend in the EU. Found that Indonesia's biodiesel had competitiveness, both in Spain and the EU. Each method for measuring competitiveness shows the similarity of results but is not exact. For the three competitiveness methods, Indonesia's biodiesel competitiveness trends are declining, both in the Spanish and EU markets, except the RCA method for the Spanish market. Based on the RCA method, both in the Spanish and EU markets show the competitiveness of each Ultimate and Extreme. Whereas using the RSCA and NRCA shows weak competitiveness in both the Spanish and EU markets. Indonesia's biodiesel competitiveness is relatively better in the Spanish market, compared to the EU market in general.

This condition can be an input for the Government of Indonesia to look back on the conditions that caused the acquisition and loss of competitiveness in the periods mentioned. Having known the causes of these conditions can be used as a basis for determining more appropriate strategies to obtain the competitiveness of Indonesia's biodiesel that is unbroken between one period to another or maintain that competitiveness.

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