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# Dynamic Competitiveness of Indonesian Commodities in Major Export Destination

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## Abstract

This study aims to analyze the export competitiveness and market position of the agricultural, manufacturing, and mining sectors in 10 main export destination countries (China, the United States, Japan, India, Singapore, Malaysia, South Korea, Thailand, the Netherlands, and the Philippines). This study uses secondary data sourced from UN COMTRADE for the period of 2013 – 2018. The data is categorized using a 2-digit Harmonized System (HS) classification. This study uses Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD) analysis tools. The RCA estimation results show the export competitiveness of Indonesia's agricultural, industrial, and mining products is still weak and strong in several major export destination countries. Meanwhile, the EPD estimation shows the Indonesia's exports of agricultural, industry, and mining commodities mostly got rising star positions in some countries but losing opportunity positions in some other countries. The following suggestions proposed are based on the research. In general, the implications of policy to improve the competitiveness of export products in the manufacturing, agriculture, and mining industries are infrastructure improvement, expansion of the export market, improvement in the quality of human resources, and employment, increasing access to finance, increasing the quality and quantity of production in processing, agriculture and mining industries, and maintaining political.

**Keywords:** *Export; Competitiveness; Revealed Comparative Advantage; Export Product Dynamics*
**JEL Classification:** F10; F14; F19

## INTRODUCTION

World economy development and the pattern of relations among countries, which generally shows decreasing distance among the countries, make the trade among countries widely open and the access of products market to other countries increase (Kementerian Perdagangan, 2011).

To measure an economic performance in such free trade era, export performance becomes immensely significant. Exports activity is the main source of foreign exchange earnings and a means to achieve economic scale and production specialization as well as access to new technologies. Export performance may also indicate industrial sector efficiency due to trade liberalization (Ridwan, 2015).

In free trade with intense levels of competition, only countries with high competitiveness will be able to survive and win the competition. On the other hand, countries with low competitiveness will only be targeted markets for products and services from the competing countries (Ningsih & Kurniawan, 2016).

Export competitiveness is one of the capabilities of a commodity to be able to penetrate international markets and survive in the international markets. Therefore, increasing competitiveness is important for improving the trade balance's performance and global development ranking.

Prior to the mid-1980s, oil and gas were the belles of Indonesian exports; thus, the role of Indonesian oil and gas was very prominent in international trade. After the decline in oil and gas exports, the role of non-oil exports in Indonesia has become even greater. In 2012-2015, the role of non-oil exports was still below 90 percent, with the lowest share in 2012, i.e., 80.54 percent. In 2016-2018, the share of non-oil and gas exports increased to 90 percent, i.e., 90.97 percent, 90.67 percent, and 90.46 percent, respectively.

In general, non-oil and gas exports can be grouped into three sectors, i.e., agricultural products, processing industries, and mining products and others. The development of non-oil and gas exports during the period of 2012-2018 seemed to fluctuate. Along the period of 2012-2015, non-oil and gas exports decreased by 2.04 percent to 9.71 percent. The biggest decrease occurred in 2015, caused by the decline in the manufacturing and mining sectors, which were quite high by 9.31 percent and 14.77 percent, respectively. The manufacturing industry is the sector providing the largest share of non-oil exports in Indonesia. Therefore, although the agriculture sector grew positively in 2015 (increased by 10.47%), total non-oil and gas exports declined due to decreasing exports from the manufacturing industry sector (decreased to 9.31 percent). After a decline in the periode of 2012-2015, non-oil exports started to increase again in 2016, which rose by 0.18 percent compared to the previous year. Likewise, in 2017 and 2018, there was an increase in non-oil and gas exports by 15.95 percent and 6.37 percent, respectively.

All sectors showed an increase in 2017 and 2018, except for the agriculture sector, which declined by 6.54 percent in 2018. The manufacturing and mining sectors increased in 2018 and grew by 4.01 percent and 20.50 percent. In 2017, these sectors also grew by 13.21 percent and 33.80 percent, respectively, and agriculture rose by 9.43 percent.

Based on the contribution to non-oil and gas exports, the manufacturing sector contributed 81.72 percent in 2017 and 79.91 percent in 2018. The value of the manufacturing industry export in 2018 increased by 4.01 percent. Still, the contribution to the total non-oil and gas exports declined 1.82 points to 79.91 percent, with a total value of US$ 130,118.1 million.

The development of manufacturing industry exports from 2012-2018 showed fluctuating values every year. During the period of 2012-2015, the export value of the manufacturing industry tended to decline, except in 2014, which increased by 3.99 percent. In 2016, the export performance of the manufacturing industry sector began to improve, as indicated by positive export value growth (increased by 1.75 percent). Likewise, in 2017 and 2018, the export value of the manufacturing industry grew quite high, i.e., 13.21 percent and 4.01 percent, respectively. The growth of the manufacturing industry export value of 13.21 percent in 2017was the highest during the period of 2012-2018.

Meanwhile, the development of exports of agricultural products shows fluctuating trends from time to time in terms of weight and value. The growth in the value of agriculture exports in 2014 and 2016 decreased by 6.26 percent and 9.98 percent, respectively. In 2015, the growth of the exports value of agricultural products showed positive performance, which rose by 10.47 percent. The increase in that year was the highest growth between 2012 and 2018. In 2017, the value of agriculture exports increased by 9.43 percent, and then decreased again in 2018 by 6.54 percent.

In addition to manufacturing and agriculture sectors, mining is one of Indonesia's most important economic sectors since Indonesia has considerable mineral and energy potential. This is indicated by the large contribution of the mining sector to Indonesia's total exports, which on average reaches 12 to 17 percent annually. The development of export value of the mining products decreased from 2012 to 2016. The highest decline occurred in 2014, i.e., 26.73 percent. However, the value rebounded in 2017 and 2018.

The development of the manufacturing industry, mining, and agriculture exports in 2012-2018 is elaborated in the following table.

**Table 1.** Development of the Manufacturing Industry, Agriculture, and Mining Exports in 2012-2018

| Year | Manufacturing Industry | | Agriculture | | Mining | |
|---|---|---|---|---|---|---|
| | Value (Million US$) | % value changes | Value (Million US$) | % value changes | Value (Million US$) | % value changes |
| 2012 | 118,115.2 | -4.74 | 3,597.7 | 6.16 | 31,322.9 | -9.57 |
| 2013 | 115,158.5 | -2.50 | 3,598.5 | 0.02 | 31,154.3 | -0.54 |
| 2014 | 119,753.8 | 3.99 | 3,373.3 | -6.26 | 22,827.7 | -26.73 |
| 2015 | 108,603.5 | -9.31 | 3,726.5 | 10.47 | 19,456.0 | -14.77 |
| 2016 | 110,504.1 | 1.75 | 3,354.8 | -9.98 | 18,164.8 | -6.64 |
| 2017 | 125,103.2 | 13.21 | 3,671.0 | 9.43 | 24,303.8 | 33.80 |
| 2018 | 130,118.1 | 4.01 | 3,431.0 | -6.54 | 29,286.0 | 20.50 |

Source: Badan Pusat Statistik, *2019*

Table 1 shows the development of Indonesia's non-oil exports from the manufacturing, mining, and agriculture sectors fluctuated in the period of 2012-2018. This could indicate the competitiveness of Indonesia's commodity exports was still weak.

Several studies related to the competitiveness of a country's export commodities have been carried out by Widyasanti (2010), Baroh et al. (2014), Ningsih & Kurniawan (2016), Ustriaji (2017), Shaul Hamid & Aslam (2017), Firmansyah et al. (2017), Wiranthi & Mubarok (2017), Hanafi & Tinaprilla (2017), Hanafi & Tinaprilla (2017), Wardani et al. (2018), Amanbayev & Masih (2020), Pratama et al. (2020), Prasetyani et al. (2020), Khaliqi et al. ( 2020), Abidin et al. (2021), Liew et al. (2021), Kurnia Lestari et al. (2022), Admi et al. (2022), Reviane et al. (2022), and Suparmono et al. (2022).

Research conducted by Amanbayev & Masih (2020), Liew et al. (2021), and Admi et al. (2022) discuss the factors that affect the export competitiveness of a commodity. Some researchers conducted studies on export competitiveness for particular Indonesian products, including tea (Khaliqi et al., 2020), textile (Prasetyani et al., 2020), clove (Pratama et al., 2020), agricultural product (Ningsih

& Kurniawan, 2016), rubber (Kurnia Lestari et al., 2022), coffee (Baroh et al., 2014), turmeric (Abidin et al., 2021), canned pineapple (Wiranthi & Mubarok, 2017), coal (Admi et al., 2022), food commodities (Firmansyah et al., 2017; Wardani et al., 2018), and cocoa (Hanafi & Tinaprilla, 2017).

Revealed Comparative Advantage (RCA) is an approach widely used to measure product competitiveness. A major advantage of using RCA is that it can determine competitiveness by country, product, and period (Suparmono et al., 2022). The study conducted by Baroh et al. (2014), Ustriaji (2017), Shaul Hamid & Aslam (2017), Firmansyah et al. (2017), Wiranthi & Mubarok (2017), Hanafi & Tinaprilla (2017), Wardani et al. (2018), Pratama et al. (2020), Prasetyani et al. (2020), Khaliqi et al. (2020), Abidin et al. (2021) and Kurnia Lestari et al. (2022) used Revealed Comparative Advantage (RCA) to analyze the competitiveness of a product.

Nevertheless, this RCA measurement has a weakness since it cannot indicate the changes in competitiveness occurring in export destination markets from time to time. Therefore, several other researchers used different competitiveness measures, such as Widyasanti (2010), Ningsih & Kurniawan (2016), and Suparmono et al. (2022), who used dynamic RCA.

Besides using dynamic RCA, other researchers such as Widyasanti (2010), Baroh et al.( 2014), Ningsih & Kurniawan (2016), Ustriaji (2017), Shaul Hamid & Aslam ( 2017), Firmansyah et al. (2017), Wiranthi & Mubarok (2017), Hanafi & Tinaprilla (2017), Hanafi & Tinaprilla (2017), Wardani et al. (2018), Pratama et al. (2020), Prasetyani et al. (2020), Khaliqi et al. (2020), Abidin et al. (2021), and Kurnia Lestari et al. (2022) used Export Product Dynamics (EPD).

The EPD is used to determine the market position of a country's products for specific market purposes. One of the advantages of EPD analysis tool is finding out whether or not a country's commodity to the destination country is continuous (dynamic) (Pradipta & Firdaus, 2014). Furthermore, this measurement can compare export performance among countries around the world. In other words, EPD method functions as a determinant of whether a product has a good performance or not on the world market.

Previous studies rarely analyzed export competitiveness based on sectors in the economy; most of them used products-based analysis. Knowing the export competitiveness of each sector can be used to design a strategy to increase a country's economic growth, so it is important to examine export competitiveness based on the economic sector

Based on the background above, this study aims to analyze export competitiveness by sector (agriculture, manufacturing, and mining in 10 main export destination using RCA so that the level of competitiveness for each sector can be discovered. In addition, this study aims to analyze the market position for each of these sectors by using EPD to know whether the performance of a product is dynamic or not.

## LITERATURE REVIEW

Porter (1990) stated that competitiveness is the ability of a country to design, produce, and market goods and services, the price characteristics and not the price of a product that makes it more attractive than the competitor's products and at the same time guarantees the market continuity of the product.

Competitiveness can also indicate an occurrence of strengthening in the domestic economy. Improvement in the competitiveness of commodity exports can be conducted when the trade performance of a commodity is optimal.

Research by Amanbayev & Masih (2020) discusses the factors that influence export competitiveness in Malaysia, showing that the inflation rate, interest rate, exchange rate, and money supply have an effect on export competitiveness.

Liew et al. (2021) examine the factors that influence the export competitiveness of agricultural products in Malaysia. The study results stated that the variable commodity prices, GDP per capita, and the 2008 crisis had a negative relationship with export competitiveness. Meanwhile, labor participation and capital formation are positively related. In addition, these independent variables have a short-run dynamic impact and a long long-term relationship on export competitiveness.

Meanwhile, Admi et al. (2022) examine the factors that influence Indonesia's coal export competitiveness to main destination countries. The results obtained show that the competitiveness of Indonesia's coal exports to eight destination countries was excellent. Meanwhile, based on panel data regression, GDP per capita, population, and coal prices had a negative and significant effect. In contrast, the exchange rate and CPO prices had no effect on coal competitiveness in eight coal-importing countries.

Other studies such as Widyasanti (2010), Baroh et al. (2014), Ningsih & Kurniawan (2016), Ustriaji (2017), Shaul Hamid & Aslam (2017), Firmansyah et al. (2017), Wiranthi & Mubarok (2017), Hanafi & Tinaprilla (2017), Wardani et al. (2018), Amanbayev & Masih (2020), Pratama et al. (2020), Prasetyani et al. (2020), Khaliqi et al. (2020), Abidin et al. (2021) and Kurnia Lestari et al. (2022) further analyze export competitiveness for a product.

Widyasanti (2010) examines whether Indonesian export competitiveness was improving after the involvement of Indonesia in AFTA and CAFTA She conducted research on Indonesian products' competitiveness in the global market using SRCA and DRCA. The results of the research are Indonesia's most significant exports in the rising star category are natural rubber and its derivatives, cars, and other motorized vehicles; fatty acids and their derivatives; lignites; unforged lead; ferroalloys; wires and cables; refined copper; petroleum and minerals; and margarine and its derivatives.

Ningsih & Kurniawan (2016), found that the ASEAN market is very important as an export destination for many Indonesian agricultural products such as live animals, cereals, tobacco, milling products and Cocoa, and Cocoa preparation. Indonesia can also seize the ASEAN market for products such as coffee, animal and vegetable fats and oil, and cocoa and cocoa preparations.

Meanwhile, Baroh et al. (2014), Firmansyah et al. (2017), Wiranthi & Mubarok (2017), Hanafi & Tinaprilla (2017), Khaliqi et al. (2020), Pratama et al. (2020), and Abidin et al. (2021) examined the export competitiveness of several agricultural products in Indonesia.

Baroh et al. (2014) state that Indonesian coffee products are competitive in the international market. Research by Hanafi & Tinaprilla (2017) shows that cocoa has a high competitive advantage in international trade. Wiranthi & Mubarok (2017) states that the canned pineapple commodity has a highly competitive

advantage by positioning a rising star in the world. While Abidin et al. (2021) state that Indonesia's turmeric is highly competitive in the global market even though it is in a falling star condition. Prasetyani et al. (2020), stating that Indonesian TPT commodities have a lost opportunity category in the main export destination countries.

## METHOD

This study uses secondary data sourced from Uncomtrade for the period of 2013 – 2018. The data use a 2-digit Harmonized System (HS) classification. The data includes the export value of 2-digit HS products from Indonesia to the main export destinations (China, the United States, Japan, India, Singapore, Malaysia, South Korea, Thailand, the Netherlands, and the Philippines), Indonesia's total exports to the main export destination countries, the value of world exports to the main export destination countries, and total world exports to the main export destination countries. This study uses Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD) analysis tools.

### Revealed Comparative Advantage (RCA)

Revealed Comparative Advantage (RCA) is used to measure the level of relative advantage or disadvantage in an industry. The value of the RCA index between 0 and 1 indicates a comparative disadvantage. If the RCA index > 1, Country i (Indonesia) has advantages in sector k.

$$RCAijk = \frac{\frac{Xijk}{Xij}}{\frac{Xwjk}{Xwj}} \quad (1)$$

Where :

RCAijk = RCA for k products exported from Indonesia in Importer Country (the level of competitiveness for Indonesian k products in importer country)
Xijk = export value of Indonesian k product in importer country
Xij = total Indonesian exports in importer country
Xwjk = value of world exports (w) in importer country
Xwj = total world exports (w) in importer country

### Export Product Dynamics (EPD)

Export Product Dynamics (EPD) is an analytical method used to analyze and identify products or commodities possessing the highest competitive power and rapid growth of products or goods in the export trade flow of a country. This indicator is used to measure the market position of a country's products for specific market purposes. This market position can be revealed since this method uses *share export total* (X) and *share export commodity* (Y).

The following formula is the method to calculate the growth of export market share and the growth of product market share.

a. The growth of export market share *i* (X axis) =

$$\frac{\sum_{t=1}^{t}\left(\frac{X_{in}}{X_n}\right)_t X\ 100\% - \sum_{t-1}^{t}\left(\frac{X_{in}}{X_n}\right)_{t-1} X\ 100\%}{T} \quad (2)$$

b. The growth of products market share *n* (Y axis) =

$$\frac{\sum_{t=1}^{t}\left(\frac{X_t}{X}\right)_t X\ 100\% - \sum_{t-1}^{t}\left(\frac{X_t}{X}\right)_{t-1} X\ 100\%}{T} \quad (3)$$

Where:
Xin = export value of a product to importer country
Xn = export value of a world product to importer country
Xt = total export value of Indonesian products in importer country
X = total value of world export products in importer country
T = number of Analysis years

EPD method has four categories, namely *Rising star, Falling star, Lost opportunity,* and *Retreat*. The highest position or the most ideal market position is the commodity which is in the *Rising Star*. Being in the *Rising Star* condition indicates that the country is gaining additional market share of a product that is growing rapidly. Market condition with an unexpected decline in export market share that leads to losing the opportunity for export share of products produced in international trade is called *Lost opportunity* category. *Lost opportunity* is characterized by a market share decrease in a product that moves dynamically. It means the supply of a product in the world is greater than that in a country. *Falling star* condition is a condition where there is an increase in export shares but it is not followed by an increase in demand for the products. While *Retreat condition* is a condition in which a country's commodity is no longer desired by market share, resulting in a negative market share and demand for commodities (Pradipta & Firdaus, 2014).

The competitiveness matrix based on *export product dynamics* (EDP) is described by Esterhuizen (2006) as seen in the following table.

**Table 2.** Competitiveness Position Matrix based on EDP

| **Growth of Export Market Share** | **Growth of Products Market Share** | |
|---|---|---|
| | Rising (Dynamics) | Falling (Stagnant) |
| Rising (Competitive) | Rising Star | Falling Star |
| Falling (Non-Competitive) | Lost Opportunity | Retreat |

Source: Esterhuizen (2006)

Besides, the competitiveness position based on the EPD method is described in the following figure:

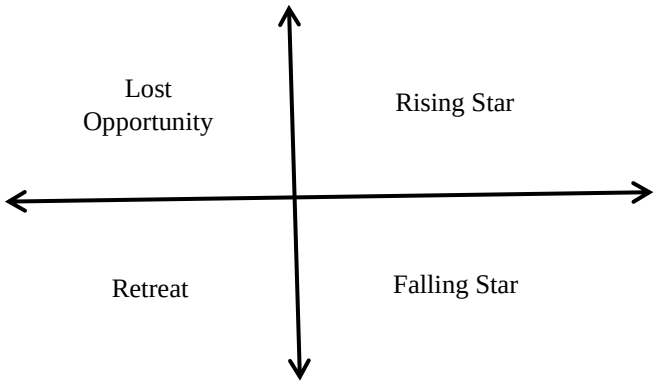


**Figure 1.** Competitiveness Position based on *Export Product Dynamics* (EPD).
Source: Esterhuizen (2006)

As seen in figure 1, the X axis represents the growth of export market share, while the Y axis shows the growth of product market share.

## RESULT AND DISCUSSION

### Competitiveness of Indonesian Agricultural Products to Major Export Destinations

The RCA values in table 3 show that Indonesian agricultural products do not have strong advantages or competitiveness (RCA value <1) in Japan. This indicates that Indonesian agricultural product exports have not been able to comparatively compete in Japan. However, Indonesian agricultural products had superior competitiveness in China, USA, India, Singapore, Malaysia, South Korea, Thailand, the Netherlands, and the Philippines. Indonesia had the strongest competitiveness in India with an average RCA value of 447.8077. This indicates that Indonesia's agricultural product exports have a high chance of competitive opportunities with other exporters in India.

The best market position for agricultural products viewed from *Export Product Dynamics* (EPD) estimation based on the "*rising star*" indicator is in the USA, Japan, Singapore, Malaysia, South Korea, Thailand, the Netherlands, and the Philippines markets. *Rising star* position means that Indonesian agricultural product exports are in the highest market position since Indonesia's agricultural product exports in this position have increased, and the market share (demand) of agricultural products exported in the international market is significantly increasing.

In addition, Indonesia's EDP estimation results in China and India are in a "*lost opportunity*" position, which means there has been a decline in market share in domestic products. Meanwhile, the export market share in the destination country has increased. This condition has caused a country to lose its share opportunity or export range for products and goods produced to the destination countries and international markets. This indicates that Indonesia loses the opportunity to competitively compete in the market share of China and India. Accordingly, Indonesia lost the opportunity to compete in China because of a decline in market share of -89284054428%. The decline led to the fact that Indonesia's agricultural commodity exports are unable to meet the export demand for agricultural commodities in China, which increased by 0.00025677%. Likewise in India, Indonesia lost the opportunity to compete in India due to a decline in market share as much as -0.677451475%. The decline caused Indonesia's agricultural commodity exports to be unable to meet the export demand for agricultural commodities in India, which increased by 0.00040505%.

**Table 3.** Value of RCA and EPD on Indonesia's Agricultural Commodity Export Period of 2013 – 2018

| No | Country | RCA Average | EPD | | EPD Position |
|---|---|---|---|---|---|
| | | | The Growth of Export Market Share (X Axis) | The Growth of Products Market Share (Y Axis) | |
| 1 | China | 6.296904279 | -89284054428 | 0.00025677 | Lost Opportunity |
| 2 | The USA | 2.461116917 | 0.000106684 | 7.42595E-05 | Rising Star |
| 3 | Japan | 0.740923177 | 0.000996709 | 0.000300634 | Rising Star |
| 4 | India | 447.8077217 | -0.677451475 | 0.00040505 | Lost Opportunity |
| 5 | Singapore | 1.890587403 | 0.006063665 | 0.00047705 | Rising Star |
| 6 | Malaysia | 6.475566063 | 0.003937019 | 0.000472816 | Rising Star |
| 7 | South Korea | 1.574426174 | 0.003534312 | 0.000216051 | Rising Star |
| 8 | Thailand | 2.294702007 | 0.395022834 | 0.000313464 | Rising Star |
| 9 | Netherlands | 1.938494272 | 5.63975E-05 | 5.23734E-05 | Rising Star |
| 10 | Philippines | 1.044946028 | 0.002751395 | 0.000335559 | Rising Star |

The problems in the agriculture sector include, among others, agricultural production which has not been able to provide adequate and continuous supply, weak mastery in agricultural yield processing technology, weak access to information and financial capital, especially for small entrepreneurs, weak business institutions, low human resource quality, the entrepreneurial character of business actors which are not optimal, and government policies that are not yet entirely conducive for the improvement of agricultural processing and marketing industries. The challenges for the agriculture sector are how to deal with the threat of new competitors, the threat of substitute products, technological and social changes, and the changing needs or preferences of consumers or buyers in the free trade era.

The implications of policies to increase the competitiveness of agriculture export products include:

1. Increasing the quantity and quality of agricultural production through the development of technology and innovation and the use of natural resources as well as human resources optimally and efficiently, along with reducing export barriers.
2. Indonesia needs to maintain export specialization in commodities which possess such advantages as plantation commodities.
3. In expanding the export market, the government of Indonesia needs to integrate the economy into a wider region by following some bilateral and multilateral agreements.
4. In optimizing the efforts to increase its exports, Indonesia needs to look for other emerging markets for products which have shown a decrease in market share of export destination countries since these products have decreased demand in their domestic markets.
5. Creating Indonesia as a market leader, market maker, market flanker, and market challenger for countries which possess high competitiveness and are not market followers.
6. Constructing and rehabilitating the infrastructure in the fields of economy, education, and health are supporting factors for economic and business growth.

**Competitiveness of the Indonesian Manufacturing Products to the Main Export Destination Countries**

Based on the estimation of RCA, Indonesian manufacturing industry products have strong competitiveness and/or advantages in China, the USA, India, Japan, Malaysia, South Korea, Thailand, and the Netherlands. Meanwhile, Indonesia's industrial products in Singapore and the Philippines have weak competitiveness (table 4). Moreover, Indonesia has the strongest competitiveness for manufacturing products in India (average RCA of 54.02%).

According to EPD position, Indonesian manufacturing industry product exports are all in the "*rising star*" position. "Rising star" position is the most ideal one. This position shows that Indonesian manufacturing product exports are competitive in the destination countries (China, USA, India, Japan, Malaysia, South Korea, Thailand, the Netherlands, Singapore, and the Philippines).

**Table 4.** Value of RCA and EPD on Indonesian Manufacturing Industry Commodity Export Period of 2013 - 2018

| No | Country | RCA Average | EPD | | EPD Position |
|---|---|---|---|---|---|
| | | | The Growth of Export Market Share (X Axis) | The Growth of Products Market Share (Y Axis) | |
| 1 | China | 5.569061741 | 6.46706E-06 | 0.000159512 | Rising Star |
| 2 | The USA | 1.867509159 | 1.01991E-06 | 2.62092E-05 | Rising Star |
| 3 | Japan | 1.200706818 | 0.001380119 | 0.000125568 | Rising Star |
| 4 | India | 54.02803787 | 0.009998099 | 0.000142959 | Rising Star |
| 5 | Singapore | 0.88782679 | 0.003434954 | 0.00016837 | Rising Star |
| 6 | Malaysia | 5.381700503 | 5.35257E-05 | 0.00014792 | Rising Star |
| 7 | South Korea | 1.61713502 | 0.002141568 | 7.19138E-05 | Rising Star |
| 8 | Thailand | 2.217952528 | 0.088276001 | 0.000375525 | Rising Star |
| 9 | Netherlands | 5.261175843 | 2.30818E-05 | 2.5509E-05 | Rising Star |
| 10 | Philippines | 0.617710177 | 0.000828539 | 0.000167075 | Rising Star |

In the manufacturing industry, there are two particular problems, namely structural and organizational problems. Structural problems occur because of the followings: first, the export and market base are still narrow; although, Indonesia has a lot of natural resources and labor, its products and markets are still concentrated in limited countries. Second, dependence on imported raw materials and intermediate inputs is still high. Third, there is no medium-tech industry. In addition, organizational problems occur since the capacity to absorb and develop technology is still low, and the human resources are still weak.

Implications of policies which can be made to increase the competitiveness of manufacturing products include:

1. Improving institutional and leadership factor
   It can be done by de-bureaucratization, competence-based placement, governmental management and feedback mechanisms, law enforcement, and synergy.
2. Improving the quality of human resources and employment.

This can be done by training incentives for industry, special regulations for foreign workers, and standardization of work competence.

3. Improvement of trade and investment incentive schemes
   It can be done by revitalizing the role of ITPC (Indonesian Trade Promotion Center), incentive and permanent trade promotion, removing taxation obstacles, tax incentives for export industries, and institutional integration.
4. Infrastructure improvement
   It can be done by improving access to industrial area roads, logistics information systems, infrastructure development, and logistics transfer to railways and sea transportation.
5. Technical efficiency improvement
   This can be done by machines revitalization, R & D facilities for the public, and facilitate copyright.
6. Providing access to finance
   This can be done by social responsibility from large industries for novice industries.
7. Increasing market access
   This can be done by expanding the export market.

**Competitiveness of Mining Sector Products to Main Export Destination Countries**

The calculation of RCA values in table 5 shows the Indonesian mining commodity exports in China and the USA have a weak competitiveness. This indicates that mining commodity exports have been unable to compete comparatively in China and the USA markets. In contrast, Indonesian mining commodities have strong competitiveness in Japan, India, Singapore, Malaysia, South Korea, Thailand, the Philippines, and the Netherlands. Moreover, the strongest competitiveness for mining commodities is in India.

Indonesia's mining commodity exports, as seen in EPD position results, are mostly in the "*rising star"* positions. South Korea is the only destination country where Indonesia is in a "*lost opportunity*" position. This fact reveals that Indonesia has lost the opportunity to be competitive in South Korean market. Furthermore, Indonesia lost the chance to compete in South Korea because there is a decline in export market share of -0.007725251%. This decrease made Indonesia's mining commodity exports unable to meet the demand for mining commodities in South Korea which increased by 0.001296306%. While for mining products, Indonesia only has an unprofitable position in South Korea.

**Table 5.** Value of RCA and EPD on Indonesia's Mining Commodity Export Period of 2013 – 2018

| No | Country | RCA Average | EPD | | EPD Position |
|---|---|---|---|---|---|
| | | | The Growth of Export Market Share (X Axis) | The Growth of Products Market Share (Y Axis) | |
| 1 | China | 0.922215361 | 6.07084E-06 | 0.000838476 | Rising Star |
| 2 | The USA | 0.193031345 | 0.000106176 | 0.000445557 | Rising Star |
| 3 | Japan | 1.490217958 | 0.001605491 | 0.00214226 | Rising Star |
| 4 | India | 877.2921019 | 0.003322731 | 0.002430298 | Rising Star |
| 5 | Singapore | 1.537820524 | 0.008397629 | 0.002862298 | Rising Star |
| 6 | Malaysia | 5.133480632 | 0.037112756 | 0.002798312 | Rising Star |
| 7 | South Korea | 1.224053663 | -0.007725251 | 0.001296306 | Lost Opportunity |
| 8 | Thailand | 1.130147216 | 0.303949413 | 0.001880783 | Rising Star |
| 9 | Netherlands | 100.9917078 | 0.000177572 | 0.00029987 | Rising Star |
| 10 | Philippines | 1.288083626 | 0.004090861 | 0.002840275 | Rising Star |

Mining is an important development pillar in Indonesia. This sector has long been a major contributor to Indonesia's national revenue. The problems related to mining include regulations/policies (overlapping cross-sectoral policies, implementation of regional autonomy which does not support state tax and non-tax charge, and minimum banking financing) and social and environmental aspects.
The implications of policies that can be conducted to increase the competitiveness of the mining products involve the following:

1. Considering the quite high business margin in the mining sector, the opportunity is expected to be well utilized by domestic banking to finance the mining sector.
2. Reducing both tax and non-tax charges.
3. Creating legal certainty.
4. Encouraging the increase in non-oil and gas mining production, including coal, copper, tin, nickel, etc., since these commodities have high forward and backward linkage as well as high competitiveness.

Increasing the role of local governments to encourage good relations between the mining companies and their surrounding communities will positively affect the development of surrounding communities and thus can avoid any possible conflicts. The results of this study are in line with research conducted by Admi et al. (2022), which state that the competitiveness of Indonesia's coal exports to eight destination countries is excellent.

## CONCLUSION

Based on RCA estimation, Indonesian agricultural products in Japan show weak competitiveness. On the contrary, Indonesian agricultural products have strong competitiveness in China, the USA, India, Singapore, Malaysia, South Korea, Thailand, the Netherlands, and the Philippines. Meanwhile, Indonesian industrial products have strong competitiveness in China, the USA, India, Japan, Malaysia, South Korea, Thailand, and the Netherlands. In addition, Indonesian competitiveness for industrial products in Singapore and the Philippines is weak. The competitiveness of Indonesian mining commodity exports is still weak in

China, Singapore, Malaysia, South Korea, Thailand, the Philippines, and the Netherlands.

According to EDP measurement, the best market position for agricultural products is in the "rising star" indicator as shown in the USA, Japan, Singapore, Malaysia, South Korea, Thailand, the Netherlands, and the Philippines markets. Nevertheless, Indonesia's EPD estimation results in product exports are all in the rising star position. EPD position results show that Indonesia's mining commodity exports are mostly in rising star positions; while South Korea is the only destination country where Indonesia is in "lost opportunity" position.

Several factors are causing the competitiveness of Indonesian commodities to be weak in the world market, including:

1. Inadequate infrastructure both in quantity and quality. The quality and the number of infrastructures are mostly low such as very small road construction. The port and airport infrastructures have very low construction, which is unable to support their activities.
2. Legal uncertainty in Indonesia. Governmental policies and regulations are often uncertain, thus disrupting the business world.
3. Labor issues related to high wages and low productivity. Wage demand rose very strongly, but this was not accompanied by work efficiency and productivity.
4. Bureaucratic problems. Such conditions affect the low ease of doing business.
5. Indonesia showed an increase in trade caused by the appreciation of the real effective exchange rate (REER) as an effect of the strengthening in the nominal exchange rate, as well as an increase in the level of domestic prices compared to other countries due to high costs.

In general, the implications of policy to improve the competitiveness of export products in the manufacturing, agriculture, and mining industries are infrastructure improvement, expansion of the export market, improvement in the quality of human resources and employment, increasing access to finance, increasing the quality and quantity of production in processing, agriculture, and mining industries, and maintaining political stability. Various Indonesian commodities from agriculture, manufacturing, and mining sectors have quite strong and even very strong competitiveness; however, some have weak competitiveness.

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