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Competitiveness of Pineapple: Focus on The Southeast Asian Region

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Abstract

Pineapple, scientifically known as Ananas comosus var. MD2, is a tropical fruit that is low in saturated fats and cholesterol, and is widely sought after in the international market due to its nutritional value. Recently, there has been concern over a downward trend in the output of Malaysian pineapples, as documented in Fruit Crops Statistic 2019. Due to the reduction in pineapple production area from 14,700.00 hectarage to 12,898.44 hectarage, this was considered to be statistically significant because the pineapple production comparison had a rapid declining tendency. Thus, this making the study significant to clarify Malaysian competitive on exporting pineapple in global market. The purpose of this study is to examine pineapple export competitiveness in Southeast Asia (Malaysia, Thailand, Indonesia, and Vietnam) from 2010 to 2020 by comparing Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) over a five-year period (RSCA). According to the findings, Malaysia does not have a competitive advantage in terms of pineapple exports to the rest of the globe in either the RCA or RSCA indices when compared to Thailand, Indonesia, and Vietnam.

Keywords: Pineapple, Southeast Asian, Export, Competitiveness, Agriculture.

Introduction

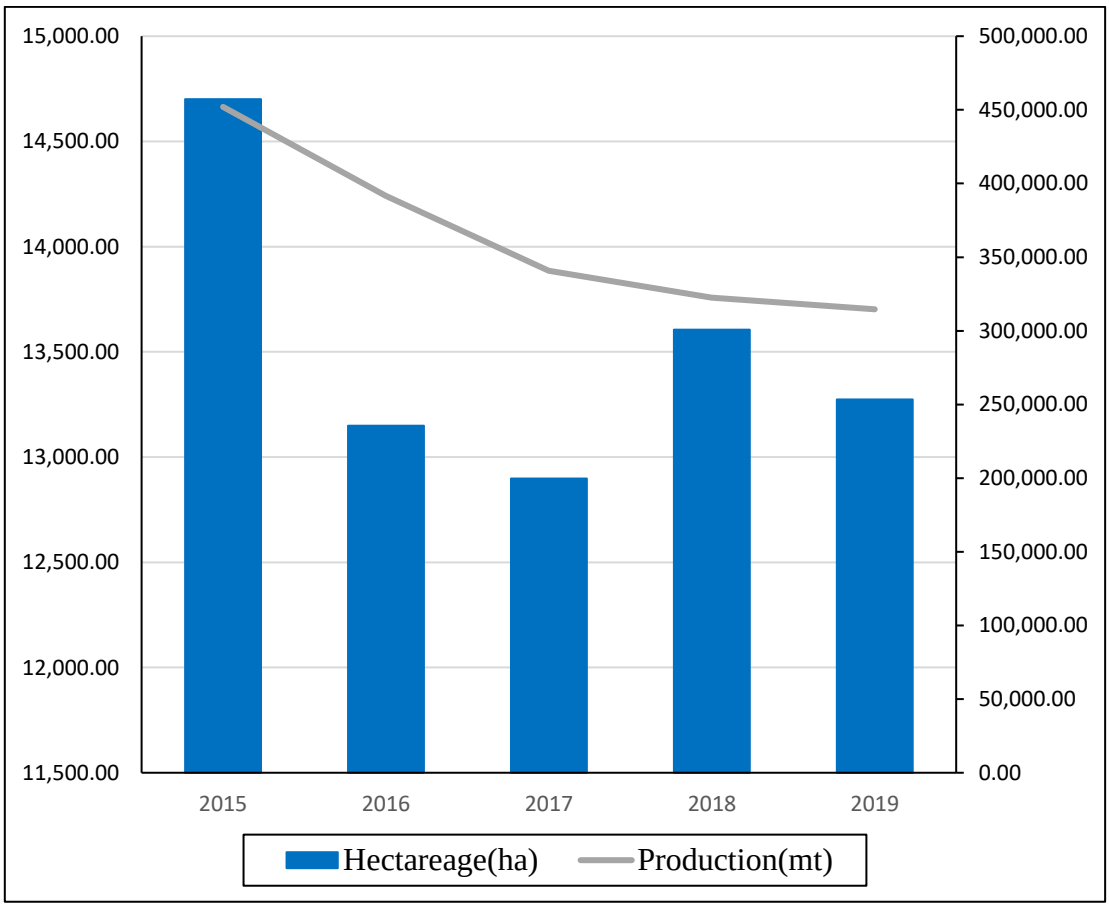
The pineapple, scientifically known as *Ananas comosus* var. MD2, is a low-fat, cholesterol-free fruit that is in high demand on the international market (Mahmud et al., 2018). Bromelain is a proteolytic enzyme that aids in digestion by digesting protein (Suntharalingam & Othman) (2017). Bromelain, among other things, has anti-inflammatory, anti-clotting, and anti-cancer properties. Additionally, UMMC (2015) states that it aids in digestion and provides a natural pain-relieving enzyme.Southeast Asia is abundant in tropical fruits and is well-known as a pineapple distributor, with countries including the Philippines, Thailand, Malaysia, Laos, and Indonesia. Pineapple is the most popular variety due to its vibrant colour, sweeter flavour, lower fibre content, four-fold vitamin C content in ripe fruit, thinner skin, smaller fruit (averaging 1.5 kg per fruit), and longer shelf life (Thalip et al., 2015). According to the Food

and Agriculture Organisation; FAO (2017), pineapple is the second most important tropical fruit in terms of global production.

To meet demand and boost the country's economy, the pineapple industry began in the southeast region with an intercropping system in 1888, and it is now known as a critical plant alongside rubber, coconut, and banana. Nevertheless, fluctuating global prices for canned pineapple in 1934 lauded the enactment of the Pineapple Industry Ordinance to regulate and progress towards the establishment of pineapple monoculture in Johor (Hidayah & Abdul, 2019).

According to Safari et al (2019), Malaysia entered into an agreement with Japan in 2015 to export pineapple classified as MD2 to meet demand. As opposed to the Philippines or Thailand, which are the primary distributors, Malaysia is also well prepared for more Halal and canned pineapple products. Nonetheless, demand for pineapple exports from Malaysia to Japan has increased by about 5% annually since 2016.According to Malaysian standard MS1041:2018, MD2 pineapple is a non-climatic variety that does not ripen after harvest and must be harvested within 145-150 days of flowering induction to achieve an appropriate degree of fruit development. At this stage, the fruit should have a cylindrical shape, green skin and crown, flat eyes, golden-yellow flesh, and a brix level of greater than 12% with a pleasant aroma.

Pineapple has high expectations and quality to be primarily exported to other countries, particularly in terms of freshness and safety of the product. Certain fruits are subjected to Good Agricultural Practices (GAPs) certification and strict treatment techniques in order to avoid pests and diseases. However, there has recently been a drop in pineapple production.



Source: Fruit Crops Statistic 2019 by Department of Agriculture

According to data from Malaysia's Department of Agriculture, as shown in Figure 1, a significant gap existed between 2015 and 2016, and it continued to narrow in 2017. This has been relatively significant with the production of pineapple having a sharp decreasing trend because the plantation area was reduced from 14,700.00 hectarage to 12,898.44 hectarage. The production then continues to fall, but it appears to be more stable as Malaysia expands its pineapple plantation area in 2018.

Factors affecting pineapple market supply in Johor, Malaysia, indicate that Malaysian pineapple's contribution to the global market has been declining in recent years, resulting in a loss of competitiveness (Jaji et al., 2018). The difficulties faced by smallholder pineapple growers in Sarawak (Nahar et al., 2020), Johor and Negeri Sembilan also reduce Malaysia's competitiveness in exporting pineapple to the international market.

Literature Review

The pineapple (*Ananas comosus* var. MD2) is a tropical fruit that is extremely popular on the international market (Mahmud et al., 2018). This is because it has a sweeter flavour, stain-free flesh, a cylindrical shape with golden yellow pulp, a very pleasant fragrance when mature, a low acidity, and a longer shelf life than other varieties (Banful et al., 2011).

As a result of the current climate and dispersion of precipitation, pineapple is mainly grown in tropical and subtropical countries. After flowering, plants can begin bearing fruit, allowing for year-round production (Shamsudin et al., 2020).

According to Banerjee et al (2018), pineapple is the only member of the Bromeliaceae family that is one of the most consumed canned fruits worldwide, which is significant and provides countries with a competitive edge. Competitiveness, also known as comparative superiority, is based on the Ricardian principle, which asserts that a country's production tends to be larger when it comes to developing new products or services.

The Revealed Comparative Advantage (RCA) index, which is based on trade currents, was developed by Balassa and established a standard method for determining comparative superiority. Comparative superiority is an important concept in international economics: because compensating superiority drives trade currents, it can be used to create indices that reflect comparative superiority in the flow of commerce (Stellian & Danna-Buitrago, 2019).

Wiranthi and Mubarok (2017) used Revealed Competitive Advantage (RCA), Export Product Dynamics (EPD), Intra-Industry Trade (IIT), and panel data regression analysis to investigate the competitiveness of Indonesia's canned pineapple exports around the world and in destination countries from 2004 to 2013. Other studies, including one in Indonesia, looked at pineapple competitiveness in seven important export destination countries.

The study examined factors affecting Indonesia's pineapple exports for main pineapple export purposes from 2001 to 2014, comparing competitiveness indexes using revealed comparative advantage (RCA), trade specialisation index (ISP), intra-industry trade (IIT), and panel data regression (Safitri & Kartiasih, 2019).

Thailand's competitiveness in canned exports and pineapple juice in canned exports and pineapple juice exports in canned and pineapple juice exports was studied by Wattanakul et al (2020) between 2013 and 2017. The study provided estimates for two markets: 1) the pineapple export and 2) the pineapple juice export using the average processed pineapple price from partners, GDP per capita, and exchange rate as power influencing factors.

These data show that while prices for both goods have a negative effect on pineapple market share, GDP per capita has a positive effect on pineapple market share and the exchange rate has a favourable effect on pineapples. There have been previous studies on

pineapple competitiveness among exporter countries. However, there is a lack of research that compares the competitiveness of pineapple exports in Southeast Asia (Malaysia, Thailand, Indonesia, and Vietnam) from 2010 to 2020.

Methodology

The purpose of this study is to examine the competitiveness of the pineapple sector in the few Southeast Asian countries that also produce pineapple, namely Malaysia, Indonesia, Thailand, and the Philippines.

Revealed Comparative Advantage (RCA) Index

According to Ricardian trade theory, the basic pattern of trade is determined by the relative advantage of the parties involved. Exporting a commodity in which the country has comparative advantage is more likely than importing a commodity in which the country has comparative disadvantage. Balassa (1965) coined the term "revealed comparative advantage (RCA)" to describe the difficult and time-consuming process of calculating production costs.
Balassa's RCA index (1965) of revealed comparative advantage was used to assess the RCA in the agriculture sectors of Malaysia, Thailand, Indonesia, and the Philippines in terms of competitiveness for pineapple commodities. The Balassa's (RCA) are particularly beneficial when it comes to determining a country's competitiveness and specialisation in commodities it produces.
Which is capable of achieving the study's objectives and conducting analysis for the four Southeast Asian nations under consideration for this research? The Relative Competitiveness (RCA) index can be built using historical trade data to reflect a country's Comparative Advantage (CA). Furthermore, the competitiveness of a commodity can be tracked over time to see how it changes.

The original formula for RCA is as follows:

$$RCA_{ip}^{t} = \frac{X_{ip}^{t} / X_{i}^{t}}{X_{wp}^{t} / X_{w}^{t}} \qquad (1)$$

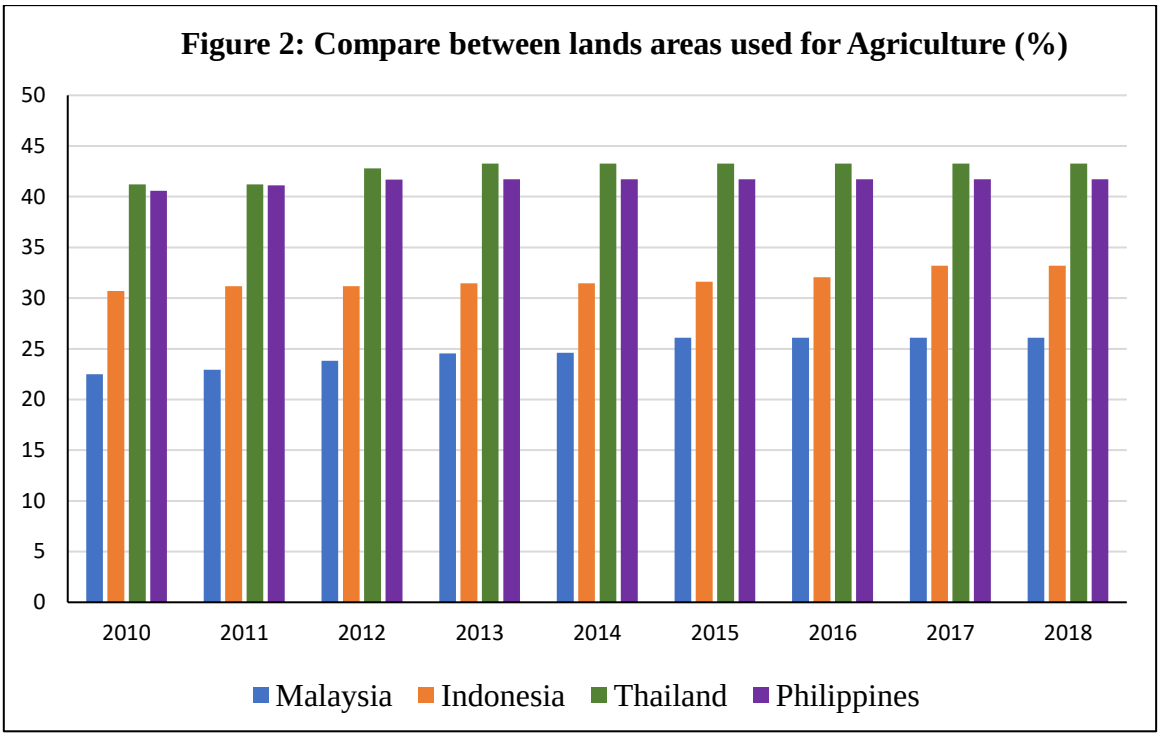
Revealed Symmetric Comparative Advantage (RCA) Index

The formula for RSCA is as follows:

$$RSCA_{ip}^{t} = \left[\left(X_{ip}^{t}/X_{i}^{t}\right)/\left(X_{wp}^{t}/X_{w}^{t}\right) - 1\right]/\left[\left(X_{ip}^{t}/X_{i}^{t}\right)/\left(X_{wp}^{t}/X_{w}^{t}\right) + 1\right] \qquad (2)$$

Where RCA_{ip}^{t} and $RSCA_{ip}^{t}$ are almost identical but the $RSCA_{ip}^{t}$ known as revealed symmetric comparative advantage have construct the value of 1 to -1. Based on the formula, the country is *I,* for product is *p* at year *t*; X_{ip}^{t} are the export for country *i* for product *p* at year *t*; X_{i}^{t} are the total export for country *i* at year *t*; X_{wp}^{t} are the world export for product *p* at year *t*; X_{w}^{t} are the total world export at year t. $RSCA_{ip}^{t}$ have a range between a negative one and a positive one, if RSCA is greater than zero, the country has a comparative advantage in that product; otherwise, it is less than zero. Product *p* represents the commodity under consideration in this study: pineapple. This study computes the RSCA using annual data from 2001 to 2020.

Discussion



Data source: World Development Indicators

Figure 2 shows the descriptive results for agricultural land, which refers to the proportion of land area that is arable, under permanent crops, and under permanent pastures. Overall, Thailand has shown dominant land that has been used for agriculture from 2010 to 2018, which is nearly 45% of the land in Thailand is purposely to agricultures economic with a variety of commodities in including the pineapple.

Followed by the Philippines, which showed a significant improvement in the percentage of land used beginning in 2010 and increasing year after year until 2018, when it reached more than 40%. Despite being one of Asia's largest countries, Indonesia ranks third in terms of agricultural land use. As a result, even though the percentage area of land used in Indonesia is only 30% to 40%, it may exceed the area per kilometre in comparison to the Philippines. Malaysia, in this case, had the lowest land use rate in Southeast Asia from 2010 to 2018, with less than 30% of land used.

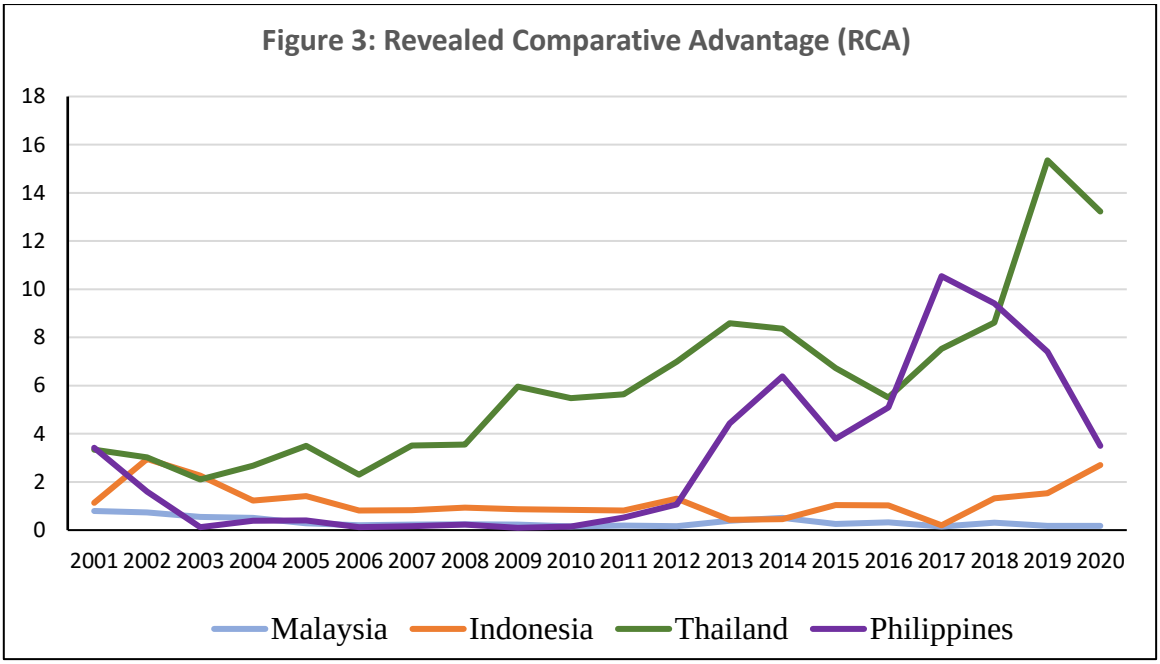


Figure 3 depicts the Balassa's RCA index (1965) of revealed comparative advantage when comparing four pineapple commodity countries. Thailand has the greatest comparative advantage in exporting pineapple to the international market when compared to the other three countries. Even though Thailand has dropped in recent years, it has shown an increasing trend when compared to other countries. Thailand has clearly shown progress since it began on a moderate comparative advantage level in 2001 until 2008, but Thailand also had a year with a weak comparative advantage in 2003 only.

Since 2009, Thailand has been in stage six, regaining a strong comparative advantage in pineapple exports to the rest of the world. In terms of pineapple exports to the international market, the Philippines is considered Thailand's closest competitor in the Southeast region. Philippine's start is slower than Thailand's, and from 2003 to 2010, the Philippines is in stage one, with no comparative advantage. In this case, the Philippines experienced significant fluctuation, reaching stage two and breaking through level four in 2013, and gaining a greater comparative advantage in 2014 with stage six. However, in 2015, the inconsistency to maintain the comparative advantage level and drop less than stage four.

The unexpected results on 2016 occurred during Thailand's loss of competitiveness, but it is still in the four to six range, which is still relevant as highly competitive, yet the Philippines have surpassed Thailand in terms of comparative advantage. Thailand, on the other hand, improved from 2018 to 2020, while the Philippines declined sharply (2017-2020). Meanwhile, Malaysia and Indonesia are almost on the same level one, indicating that there has been no comparative advantage for many years. However, Indonesia is still capable of moving from a zero comparative advantage to a low comparative advantage by the end of 2019.

Table 1: Revealed comparative advantage (RCA) stage

Stage	Range	Level comparative
4	4 < RCA	High comparative advantage (Strong)
3	2 < RCA ≤ 4	Moderate comparative advantage (Medium)
2	1 < RCA ≤ 2	Low comparative advantage (weak)
1	0 < RCA ≤ 1	No comparative advantage (Zero)

The RCA result is relatively related to the export value for these four countries. Table 2 shows that Malaysia has been the lowest of the countries in almost five years, from 2016 to 2020. As a consequence, Malaysia considers less pineapple production and is unlikely to supply pineapple in large quantities to other countries. In comparison, Thailand produces a lot of pineapple and can support the supply market for pineapple on the international market. To be recognised as one of the top pineapple exporter countries in the world, Thailand must first be known for having a large stock market of pineapples and having overproduction in their own country. It is then natural for Thailand to export this commodity to the international market.

Figure 4: The Revealed Symmetric comparative advantage (RSCA)

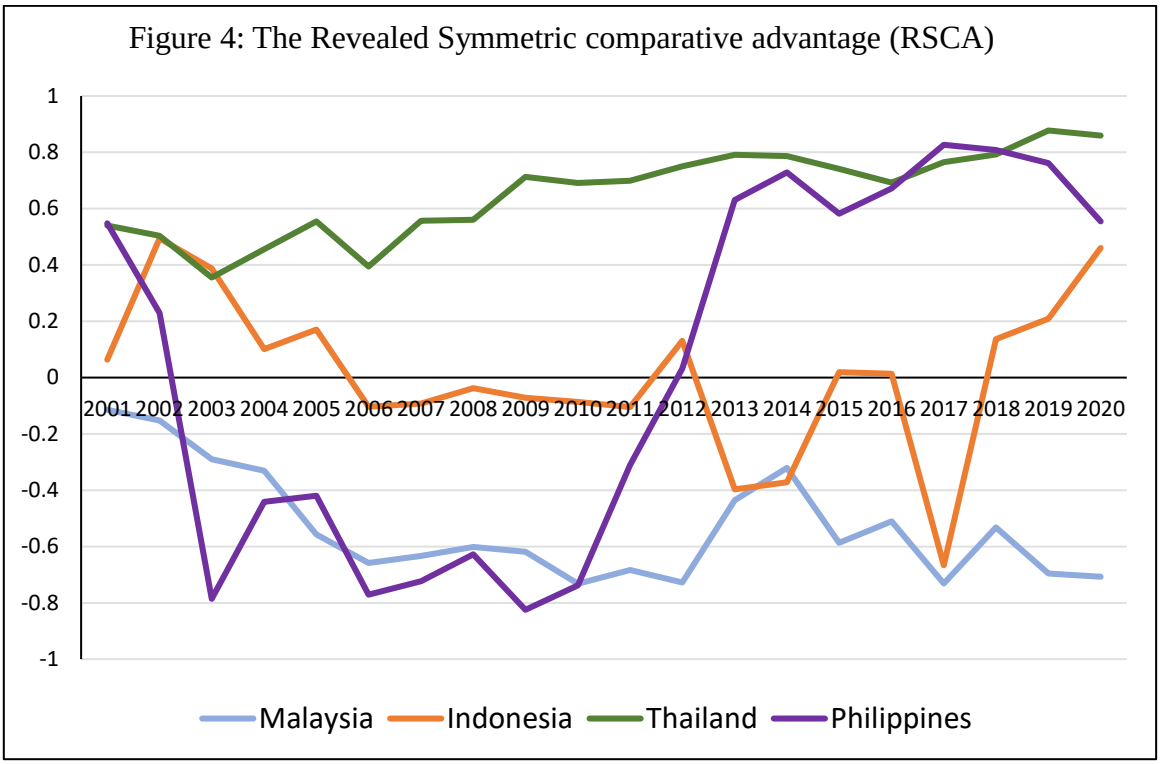


Figure 4 shows the revealed symmetric comparative advantage (RSCA) Index, which is nearly identical to the RCA. However, RSCA has made a minor adjustment to keep the comparative index range between 1 and -1. If a country's RSCA score is greater than zero and positive, it indicates that the country has a comparative advantage in pineapple exports. If the value is negative, it indicates that there is no comparative advantage level. This clearly gives Malaysia no comparative advantage from 2001 to 2020, as the RSCA results show Malaysia is always in the negative range.

Among these four countries, Thailand is the only one that has maintained a positive value from 2001 to 2020, indicating that Thailand is a top supplier to the Philippine market in the Southeast region. This demonstrates that Thailand earns a lot of money from exporting pineapple to other countries when compared to the other three. Indonesia and the Philippines exhibit high inconsistency and fluctuation, but both countries gained either a negative or positive value from 2001 to 2020. As the Philippines had a positive RSCA value from early 2001 to 2002 and from 2012 to 2020. Nonetheless, Indonesia had a positive value from 2001 to the middle of 2005, then fell to a negative value before regaining a positive value from 2018 to 2020.

Conclusion

This study examines Malaysia's competitive position in relation to three specific countries (Thailand, Indonesia, and the Philippines), all of which export pineapple globally. It is clear from the results that Malaysia needs to focus on improving exports and competing for a larger share of the pineapple market. Furthermore, when compared to Thailand, Indonesia, and the Philippines, Malaysia still has the lowest percentage of agricultural land, which is less than 30%.

Malaysia has no comparative advantage because its annual pineapple production is insufficient to meet global market demand. With low pineapple production in the Malaysian market, Malaysia may not be able to supply a large amount of pineapple to the international market. Only if Malaysia has a strong dedicated desire to compete with global pineapple exporters from all over the world is the best practice to strengthen the agriculture economic by promoting more land areas to plant pineapple as a cash crop. Thus, all states in Malaysia must have targeted pineapple production in order to increase supply and enable pineapple, particularly MD2, to compete in the global market in the near future.

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