

Analysis of the Level of Competitiveness of Indonesian Mangosteen, Mango, and Guava Exports in the International Market

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Abstract. Non-oil and gas exports play a crucial role in Indonesia's economy, particularly due to their more stable and increasing contributions compared to oil and gas exports, which are vulnerable to fluctuations in global oil prices. This research aims to: 1) determine the comparative advantage of Indonesia's mangosteen, mango, and guava exports in the international market; 2) assess the competitive advantage of these exports; and 3) evaluate the level of trade specialization in Indonesia's mangosteen, mango, and guava exports in the international market. The data used in this study is secondary data related to the exports of mangosteen, mango, and guava from Indonesia during the period of 2013-2023. The data analysis techniques employed include descriptive analysis and quantitative analysis using the Revealed Comparative Advantage (RCA) approach, Export Competitiveness Index (ECI), and Specialization Index (ISP). The results indicate that Indonesia has a strong comparative advantage in the international market, a strong competitive advantage, and is positioned as a leading exporter of mangosteen, mango, and guava.

Keywords: ECI, Export, ISP, RCA

1. INTRODUCTION

Indonesia is a developing country that has abundant natural resources. In entering the era of free trade, Indonesia must create the right strategy to maintain its position as an exporter in the world. Indonesia is known as one of the leading producers of tropical fruits, such as mangosteen, mango, and guava because these fruits contain high antioxidants and fiber. In addition, Indonesia itself has a large area in the development of tropical fruits. Tropical fruits in the international market control around 22 percent of total production in 2020 (FAOSTAT, 2023).

In recent years, Indonesia's international trade has experienced significant dynamics, especially in the oil and gas and non-oil and gas sectors. Non-oil and gas exports play a very important role in the Indonesian economy, especially because their contribution is more stable and tends to increase compared to oil and gas exports which are vulnerable to fluctuations in world oil prices. The non-oil and gas sector, including agriculture, processing industry, and mining, provides diversification of state revenue sources and strengthens economic resilience to external shocks. In addition, non-oil and gas exports, especially horticultural commodities such as mangosteen, mango, and guava, have great potential to be developed in the international market.

Export fluctuations tend to be more stable but are still influenced by changing international market demand, as well as domestic industry dynamics related to small export products or *niche markets* (Widiastuti, 2022). Although the non-oil and gas sector as a whole is growing, each sub-sector faces specific challenges that affect their export performance in the international market.

The growth of agricultural commodity exports, especially horticulture, is an important indicator in understanding the competitiveness and contribution of Indonesia's agricultural sector in the international market. Commodities such as vegetables and tubers (HS 07) with fruits, and nuts (HS 08) not only reflect the diversity of Indonesian agricultural products but also the great potential in supporting the national economy through exports. To provide an overview of the export performance of horticultural commodities, namely vegetables and tubers (HS 07) with fruits, and nuts (HS 08).

International trade plays a very important role in improving the welfare of the global community, especially in the economy of each country (Girsang & Bendesa, 2023). Each country is required to develop the potential of natural resources and human resources in order to compete in the global economy and build its country's economy towards a better direction which is reflected in the ever-growing economic growth rate (Firmansyah & Indrajaya, 2023). The global market offers great potential but also presents a number of challenges for Indonesian mangosteen, mango, and guava exports. Differences in trade regulations, export procedures, product competition from competing countries such as Thailand and Malaysia, as well as changes in consumer trends and preferences are important aspects in understanding the challenges faced by Indonesian mangosteen, mango, and guava exports.

Analysis of the level of competitiveness of Indonesian mangosteen, mango, and guava exports in the international market is very important considering the dynamic global trade environment, changes in foreign trade policies, and increasingly tight competition. The largest exporting countries of mangosteen, mango, and guava in the world in 2023. Indonesia in 2022 is the 3rd largest exporting country of mangosteen, mango, and guava in the world. The countries with the largest exporters of mangosteen, mango, and guava in the world are Thailand, India, China, and Kenya.

	Ta	able 1.
The World's Fiv	e Largest Mangosteen, M	ango, and Guava Exporting Countries in 2022
Constant	E-mart Value (USC)	$\mathbf{F}_{}$

Country	Export Value (US\$)	Export Volume (Kg)
Thailand	515.278.465	337.267.153
India	220.198.437	171,748,679
Indonesia	76.256.353	30,625,941
China	65,738,389	43,420,915
Kenya	20,854,160	24,942,786

Source: UN Comtrade, processed data, 2024

The competitiveness of Indonesian mangosteen, mango, and guava exports depends on a number of factors, including product quality, production efficiency that can be improved through better technology and management, market access through adequate trade infrastructure, supportive trade policies, and innovation in production and marketing methods (Mustafa, 2018). In this context, an in-depth analysis of market dynamics, competition, and strategies implemented by competing countries in mangosteen, mango, and guava exports needs to be carried out in order to identify Indonesia's competitive advantages. In this comparison, factors such as export volume, export value, market structure, and market share in these countries need to be considered. For example, according to FAOSTAT data, Thailand is one of the main producers of mangosteen, mango, and guava in the world with a significant amount of production in 2020, while Vietnam has advantages in accessing certain markets in Europe (FAOSTAT, 2023).

Exports will help the country meet development needs through comparative advantages, availability of product factors, and efficiency of labor productivity (Herniati & Indrajaya, 2021) . Increasing the competitiveness of Indonesian mangosteen, mango, and guava exports requires a detailed and targeted strategy. This strategy must be based on a comprehensive global market analysis and an in-depth evaluation of the key factors that influence competitiveness. One of the first steps is to strengthen the aspects that are Indonesia's competitive advantages in mangosteen, mango, and guava exports, for example through efforts to improve product quality, production cost efficiency by implementing modern technology, and implementing strict international standards to meet global market needs.

Until now, research on the analysis of the level of competitiveness of Indonesian mangosteen, mango, and guava exports, especially in the context of the international market, is still limited. Although several studies have reviewed competitiveness factors and export strategies in the agricultural sector, such as tropical fruits such as research conducted by Widhiyoga et al. (2023) on the performance of Indonesia's leading tropical fruit exports to major destination countries. Another study conducted by Yudha (2023) also discussed strategies to increase the efficiency of Indonesian mangosteen exports, focusing on destination countries such as Hong Kong and Malaysia which have competitiveness and comparative advantages. Research conducted by Rahmadhani (2018) discussed the growth of Indonesian mangosteen exports from 2001 to 2015, which showed a significant increase in both volume and export value. Although Indonesia has strong competitiveness in mangosteen exports such as Mexico, Thailand, and India.

Currently, there is no in-depth and focused review on the analysis of the level of competitiveness of mangosteen, mango, and guava exports in the international market. Therefore, this study combines existing aspects in one comprehensive and actual review to fill the gap and provide the latest insights for understanding the analysis of the level of competitiveness of Indonesian mangosteen, mango, and guava exports. This study also differs from the research of Firmansyah (2016) and Asrol & Heriyanto (2017) in the methodological approach used, namely the *Revealed Comparative Advantage* (RCA) method, *the Export Competitiveness Index* (ECI) method, and the Specialization Index (ISP) method. The selection of variables that are more careful or more focused on different analyses of the level of competitiveness of mangosteen, mango, and guava exports in the international market, and also updates the latest data from 2013-2023 starting from export value, import value, total world exports in this commodity, and total exports of all commodities.

2. RESEARCH METHODS

This research is a type of quantitative descriptive research that uses secondary data to support the analysis. The location of the research was conducted in Indonesia. The selection of this region is because this study will analyze the level of competitiveness of Indonesian mangosteen, mango and guava exports to the international market. The object of this research was carried out on Indonesian mangosteen, mango, and guava export commodities with the *Harmonized System* (HS) code 080450. The object of this research is Indonesian mangosteen, mango, and guava export data for 2013-2023. The variables in this study focus on the Level of Competitiveness of Mangosteen, Mango, and Guava Exports and the international market. The data source used is from UN Comtrade .

Data were collected by means of documentation from various sources. Documentation techniques in data collection are methods that involve collecting information from previously existing written documents (Sugiyono, 2016). The data analysis methods used are descriptive analysis methods and quantitative analysis methods. Quantitative analysis was carried out using *the Revealed Comparative Advantage* (RCA), *Export Competitiveness Index* (ECI), Specialization Index (ISP) approaches. The results of the RCA, ECI, and ISP calculations will be described according to the theory of the analysis tools. In calculating the data, the researcher used the *Microsoft Excel* 2019 application.

RCA (Revealed Comparative Advantage)

Revealed Comparative Advantage (RCA) method is one of the methods used to analyze comparative competitiveness. The variables measured are the ratio of the export value of Indonesian mangosteen, mango, and guava in 2013-2023 to the total export value of Indonesia in 2013-2022 which is then compared with the export value of mangosteen, mango, and guava in the world in 2013-2022 to the total export value of the world in 2013-2023 (Tambunan, 2003)

The method for calculating RCA according to Tambunan (2004) is as follows.

Information :

RCA ij : RCA value of mangosteen, mango, and guava commodities in Indonesia in 2013-2022

X ij : The export value of mangosteen, mango and guava commodities from Indonesia in 2013-

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2022
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XijT : Total export value of all Indonesian commodities in 2013-2023

 $X_i D$: World export value of mangosteen, mango and guava commodities in 2013-2023

 $X_i DT$: Total export value of all world commodities in 2013-2023

- *i* : Indonesian country
- *j* : Year 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022,2023

ECI (*Export Competitiveness Index*)

The calculation method used to calculate competitive advantage is the *Export Competitiveness Index* (ECI). This method shows the ratio of a country's export share of Indonesia in the international market for mangosteen, mango, and guava commodities in the period 2013-202 3 (t) with the ratio of the international market share for mangosteen, mango, and guava commodities in the previous period (t-1) (Ustriaji, 2016). The ECI formula can be seen below.

$$ECI_{IJ} = \frac{(\frac{X_{IJ}}{X_{JD}})^{t}}{(\frac{X_{IJ}}{X_{ID}})^{t-1}}....(3.2)$$

Information

ECI i^j: ECI value of mangosteen, mango, and guava commodities in Indonesia in 2013-2023 X_i : Export value of mangosteen, mango, and guava commodities in Indonesia in 2013-2023 XjD : World export value of mangosteen, mango and guava commodities in 2013-2023

t : Current period

t-1 : Previous period

ISP (Trade Specialization Index)

ISP is a comparison between the difference in the value of exports and imports of a country compared to the total value of exports and imports of that country, or in other words, ISP is a comparison between the difference in the net value of trade with the total value of trade of a country. The ISP index can also be used to analyze the process of industrialization stages and the development of commodity trade patterns (Yudha & Malau, 2023) . The variables measured are the comparison between the difference in the value of Indonesian mangosteen, mango, and guava exports in 2013-2022 and the value of Indonesian mangosteen, mango, and guava exports in 2013-2023 compared to the total value of Indonesian mangosteen, mango, and guava exports in 2013-2023 and the value of Indonesian mangosteen, mango, and guava imports in 2013-2023.

Mathematically, ISP can be described as follows.

$$ISP_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}....(3.3)$$

Information

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ISP ij : ISP value of mangosteen, mango, and guava commodities in Indonesia in 2013-202 3 *X i* : Export value of mangosteen, mango and guava commodities of Indonesia in 2013-2015 2023

M ij : Import value of mangosteen, mango, and guava commodities in Indonesia in 2013-202

3. RESULTS AND DISCUSSION

Indonesia is one of the largest tropical fruit producing countries in the world, with superior products such as mangosteen, mango, and guava. These three fruits are not only important commodities for the domestic market but also have a significant market share in the international arena. In recent years, global demand for tropical fruits has continued to increase along with the healthy lifestyle trend in developed countries (Rahman, 2023). As one of the main exporters, Indonesia has great potential to optimize exports of these three commodities to improve the national economy (Setiawan & Putri, 2022).

Comparative Competitiveness of Indonesian Mangosteen, Mango, Guava Exports in the International Market

The comparative advantage of Indonesian mangosteen, mango, and guava commodities can be evaluated using the Implicit Comparative Advantage Index (RCA). The *Revealed Comparative Advantage (RCA)* theory is used to evaluate a country's comparative advantage in exporting certain commodities compared to other countries. According to Tambunan (1965), an RCA value > 1 indicates that a country has a comparative advantage in exporting certain commodities, while a value less than 1 indicates a comparative disadvantage. The higher the RCA value, the stronger the comparative competitiveness of Indonesian mangosteen, mango, and guava commodities. In this context, RCA is used to analyze the export competitiveness of Indonesian mangosteen, mango, and guava in the international market. The results of the RCA analysis of Indonesian mangosteen, mango, and guava can be seen more clearly in Table 2. below .

 Table 2 .

 Comparative Competitiveness of Indonesian Mangosteen, Mango, Guava Exports in the International Market

	International Market					
Year	Indonesia's Export	Value of Indonesian	World Export Value of	World Commodity Export Value	RCA	
	Value to the	Exports to the	Mangosteen,			
	World	World (US\$)	Mango, Guava			
2013	7,251,891	182,551,754,383	1,865,356,522	18,564,468,145,281	0.39	
2014	8,449,861	176.036.194.332	2,085,992,789	18,475,669,244,364	0.42	
2015	19,135,364	150.366.281.305	2,107,031,322	16,143,699,654,150	0.97	
2016	21,072,255	144,489,796,418	2,364,414,664	15,690,999,151,471	0.96	
2017	5,220,602	168,827,554,042	2,896,338,098	17.262.159.960.015	0.18	
2018	34,528,164	180.215.034.094	2,966,172,919	18,967,958,134,468	1.22	
2019	44,421,644	167,682,995,133	3,491,608,419	18,427,726,868,181	1.39	
2020	82,373,907	163.191.837.310	3,454,543,285	17,191,039,841,907	2.51	
2021	72,657,973	231,522,458,128	3,836,240,920	21,682,891,392,531	1.77	
2022	76.256.353	291,979,090,608	2,424,698,622	22,990,655,737,111	2.47	
2023	113,362,922	258,774,386,645	3,458,931,041	21,334,838,682,879	2.70	
Average				1.36		

Source: UN Comtrade, data processed 2024

Table 2 data shows that Indonesia's RCA value for mangosteen, mango, and guava exports in 2013 was 0.39, indicating that in 2013 Indonesia did not yet have a comparative advantage in exporting these commodities. The low RCA value may be due to challenges in market access and infrastructure that were still limited at that time. Rahman and Rahman (2023) note that developing countries often face challenges in increasing export competitiveness, especially due to limited infrastructure and technology that support the production and distribution of agricultural commodities.

In 2015, Indonesia's RCA value increased to 0.97, almost approaching 1, indicating an increase in competitiveness. According to Setiawan and Putri (2022) this increase is associated with investment in post-harvest technology and the Indonesian government's efforts to expand international market access through trade agreements and improving product quality. Better post-harvest technology increases the shelf life and quality of products, which are critical to the competitiveness of agricultural commodities in the global market.

Indonesia's RCA value reached 1.22 in 2018, indicating a clear comparative advantage in mangosteen, mango, and guava exports. Wahyuni and Wibowo (2023) showed that market diversification, namely expansion into countries with high demand for tropical products, plays a key role in increasing this competitiveness. Market diversification not only reduces dependence on certain markets but also increases the visibility of Indonesian products in the global market, which in turn increases demand.

The peak of Indonesia's RCA value was seen in 2020 with a value of 2.51. This shows that Indonesia not only has a comparative advantage but is also starting to dominate the global market for this commodity. Lestari and Pratama (2021) noted that political and economic stability, along with supply chain efficiency, are important factors supporting this comparative advantage. When other countries face economic and political uncertainty, Indonesia is able to take advantage of its stable domestic conditions to strengthen its market position at the international level.

Despite a slight decline in 2021, 2022, and 2023, the RCA values remained high at 1.77, 2.47, and 2.70, respectively, indicating that Indonesia still maintains its comparative advantage in mangosteen, mango, and guava exports. Nugroho and Widianto (2023) highlighted that increased competition from other countries and changes in global demand can affect the RCA value, but Indonesia has managed to maintain its competitiveness through adaptive and innovative export strategies. These strategies include improving product quality, diversifying markets, and increasing logistics efficiency.

Overall, RCA data shows that Indonesia has succeeded in increasing its comparative competitiveness in exporting mangosteen, mango, and guava in the international market. Although there are fluctuations from year to year, the general trend shows a positive increase. To maintain and increase this RCA value, a comprehensive strategy is needed, including market diversification, improving product quality, and strengthening trade relations with partner countries.

Competitiveness of Indonesian Mangosteen, Mango, Guava Exports in the International Market

Export Competitiveness Index (ECI) is an important indicator in understanding how a country can compete in the international market. ECI measures a country's ability to maintain and increase its export market share, taking into account factors such as production efficiency, innovation, and marketing strategy. An ECI value > 1 indicates that Indonesia has a trend of increasing competitiveness or strong competitiveness among other competing countries in the world. The higher the ECI value, the stronger the competitiveness of Indonesian mangosteen

commodities. According to Porter (1990), a country's competitiveness is not only determined by basic factors such as natural resources, but also by the country's ability to create added value through improving quality, innovation, and mastery of technology. The results of the ECI analysis of Indonesian mangosteen, mango, and guava can be seen more clearly in Table 3 below.

Table 3 .
Competitiveness of Indonesian Mangosteen, Mango, Guava Exports in the International
Market

Year	Indonesia's Export Value to the World	Export Value of Mangosteen, Mango, Guava from Indonesia to the World (US\$)	ECI
2013	7,251,891	1,865,356,522	0.30
2014	8,449,861	2,085,992,789	1.04
2015	19,135,364	2,107,031,322	2.24
2016	21,072,255	2,364,414,664	0.98
2017	5,220,602	2,896,338,098	0.20
2018	34,528,164	2,966,172,919	6.45
2019	44,421,644	3,491,608,419	1.09
2020	82,373,907	3,454,543,285	1.87
2021	72,657,973	3,836,240,920	0.79
2022	76.256.353	3,385,964,349	1.18
2023	113,362,922	3,458,931,041	1.45
Average			1.60

Source: UN Comtrade, data processed 2024

In the table presented, it can be seen that the ECI of Indonesian mangosteen, mango, and guava exports fluctuated from 2013 to 2023. In 2013, Indonesia's ECI was at 0.30, indicating that Indonesia was still in the early stages of building its competitive advantage. Research by Balassa (1989) shows that countries with low ECI usually face challenges in entering international markets due to lack of product differentiation and constraints in accessing global markets.

The significant increase in ECI in 2015, reaching 2.24, reflects improvements in product quality and the implementation of more effective marketing strategies. This is consistent with Porter's theory (1990), which emphasizes the importance of innovation and technological development as the main factors in increasing global competitiveness. This increase can also be attributed to market diversification that allows Indonesia to reduce dependence on traditional markets and reach new, more profitable markets.

In 2018, Indonesia's ECI peaked at 6.45, indicating Indonesia's success in optimally utilizing global market opportunities. According to the UNCTAD report (2022), this increase in ECI may be due to the increasing global demand for tropical products and the strengthening of export infrastructure in Indonesia. This shows that Indonesia is able to increase its competitiveness by taking advantage of ongoing global trends, such as increasing consumer awareness of organic and sustainable tropical products.

However, the decline in ECI in 2021 to 0.79 indicates new challenges that Indonesia must face. Factors such as global price fluctuations, changes in international trade policies, and supply chain disruptions due to the Covid -19 pandemic may be the main causes of this decline. According to Porter (1990), countries that want to maintain their competitiveness must continue to adapt to changes in the global environment, both through product innovation and the development of more flexible marketing strategies.

Overall, Indonesia's average ECI during the 2013-2023 period was 1.76, indicating that Indonesia has quite good competitiveness in mangosteen, mango, and guava exports, although there are significant fluctuations from year to year. To maintain and improve this competitiveness, Indonesia needs to focus on increasing production efficiency, developing products with high added value, and expanding international distribution networks. Increasing competitiveness can also be supported by government policies that encourage the development of export-based industries and the creation of a conducive business environment.

Export Trade Specialization Index of Mangosteen, Mango, Guava Indonesia in the International Market

Trade Specialization Index (ISP) is an important indicator used to measure the degree of specialization of a country in international trade of a commodity. According to Tambunan (2004), ISP is calculated based on the comparison between the export and import values of a commodity, where an ISP value approaching 1 indicates that the country is highly specialized in exporting the commodity, while an ISP value approaching -1 indicates specialization in imports. The results of the analysis of ISP mangosteen, mango, and guava in Indonesia can be seen more clearly in Table 4 below.

Table 4 .
Export Trade Specialization Index of Mangosteen, Mango, Guava in Indonesia in the
Market
International

International			
Year	Indonesia's Export Value to the World	Indonesia's Import Value to the World (US\$)	ISP
2013	7,251,891	353,581	0.90
2014	8,449,861	582,339	0.87
2015	19,135,364	2,467	0.99
2016	21,072,255	14,442	0.99
2017	5,220,602	13.205	0.99
2018	34,528,164	5,061	0.99
2019	44,421,644	700	0.99
2020	82,373,907	804	0.99
2021	72,657,973	40	0.99
2022	76.256.353	219	0.99
2023	113,362,922	4.774	0.99
Average			0.97

Source: UN Comtrade, data processed 2024

From Table 4. presented, it can be seen that the ISP for Indonesian mangosteen, mango, and guava exports is almost always close to 0.99 during the period 2013-2023. This shows that Indonesia has a very high level of specialization in trading these commodities in the international market. This high ISP value also reflects that Indonesia is more focused on exporting these commodities compared to importing them, which is consistent with the country's goal of becoming a major player in the global market in the tropical fruit sector. According to Harjadi (2023), consistent policies in encouraging superior commodities can increase product competitiveness in the international market.

In 2013, Indonesia's ISP for this commodity was recorded at 0.90, indicating that despite very little dependence on imports, exports still dominate. According to Suryana et al. (2022), a high ISP usually occurs when a country has a comparative advantage in the production of a commodity, which is obtained through a combination of factors such as a favorable climate, extensive land availability, and skilled labor.

Over time, Indonesia's ISP has continued to increase and reached a near-perfect value of 0.99 in most years during the period. This shows that Indonesia barely imports mangosteen, mango, and guava, so the country is highly dependent on its export capabilities. According to Zysman (1983) showed that a high level of specialization can indicate that a country has succeeded in building an efficient and internationally competitive agribusiness sector, and has sufficient production capacity to meet global demand.

In addition, the stable ISP at a high value throughout the last decade also indicates the resilience of Indonesia's export market to global economic fluctuations. Despite challenges such as climate change and global price volatility, Indonesia has been able to maintain its dominant position in the international tropical fruit market. This can be explained by the existence of a national strategy that focuses on developing agricultural infrastructure, improving product quality, and expanding new markets. According to Mulyani (2023), the quality of Indonesian horticultural products that have been internationally recognized and support from the government in terms of improving production technology and post-harvest management play an important role in maintaining the competitiveness of this commodity in the global market.

Overall, Indonesia's ISP average during the period 2013-2023 is 0.97, indicating that Indonesia has achieved almost perfect specialization in the export trade of mangosteen, mango, and guava. This success shows that Indonesia is not only maximizing its natural potential, but also implementing effective policies and strategies to support the export sector. To maintain and improve this specialization, it is important for Indonesia to continue to innovate, improve product quality, and expand a wider international trade network.

4. CONCLUSION AND SUGGESTIONS

Conclusion

Based on the results of the research discussion on the analysis of the level of competitiveness of Indonesian mangosteen , mango and guava exports in the international market, the following conclusions can be drawn .

- Judging from the results of the *Revealed Comparative Advantage calculation* (RCA) in the period 2013-2023, shows that Indonesia has strong comparative competitiveness in the international market.
- Judging from the results of the *Export Competitiveness Index* (ECI) calculations for the period 2013-2023, it shows that Indonesia has strong competitive power in the international market.
- 3) Judging from the results of the calculation of the Trade Specialization Index (ISP) for the period 2013-2023, it shows that Indonesia has strong competitiveness in the international market or tends to be an exporting country for mangosteen, mango and guava.

Suggestion

Based on the conclusions that have been drawn, the suggestions that can be given based on the results of this study are that in increasing the competitiveness of commodities, steps are needed to improve performance and support export policies that support. Increasing productivity and efficiency of export costs is also very important to improve overall trade performance. Although the export value of these commodities fluctuates, strong competitiveness still offers great opportunities in the international trade market. Therefore, producers need to strengthen commodity promotion and increase export value, while remaining sensitive to existing opportunities. In addition, the government is expected to maintain overall economic stability. Further research is expected to develop an understanding of other factors that influence the level of export competitiveness .

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