Analysis of the Export Competitiveness of Indonesia's Horticultural Fruit Products in the International Market

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Abstract: This study examines the export competitiveness of Indonesian fruit horticulture products—specifically HS codes 080450 (mangosteen), 080390 (banana), 080430 (pineapple), and 081060 (durian)—in key international markets: Malaysia, Singapore, China, Hong Kong, Saudi Arabia, and the United Arab Emirates. Using Revealed Comparative Advantage (RCA), Export Product Dynamics (EPD), and the Gravity Model, it reveals varying levels of competitiveness, with most products showing limited strength. Mangosteen and bananas exhibit a comparative advantage (RCA > 1) but are classified as Falling Stars due to declining market shares. This suggests underutilized potential is constrained by quality, logistics, and market adaptation. In contrast, pineapples in China and the UAE show export growth despite a low RCA, indicating Rising Star status and potential to enhance competitiveness through better quality, certification, and promotion. Gravity Model estimates suggest that exports are significantly influenced by destination countries' GDP, population, export prices, and exchange rates. GDP and population positively affect high-value commodities like durian and pineapple, while economic distance negatively impacts trade due to logistical challenges. The results underscore the need for targeted strategies to enhance product quality, logistics, and market access, particularly in countries with large populations and high purchasing power, to strengthen Indonesia's global horticultural export position.

Keywords: *Export Competitiveness; Revealed Comparative Advantage; Export Product Dynamic; Gravity Model; International Markets.*

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I. INTRODUCTION

The agricultural sector plays an important role in the Indonesian economy, where it is not only a source of livelihood for millions of people but also contributes greatly to the national Gross Domestic Product (GDP). Data from the Central Statistics Agency (BPS) notes that by 2022, the sector will contribute around 12.4% of total GDP, with the horticulture subsector occupying a strategic position due to its role in providing nutritious food and its high export potential [1].

Among horticultural commodities, tropical fruits, such as bananas, mangoes, pineapples, and durians, occupy a leading position. Indonesia is known as one of the countries with the greatest diversity of tropical fruits in the world. The production of these fruits continues to increase every year, along with the high demand from both domestic and global markets [2]. However, the increase in production has not been fully reflected in export performance. Indonesia's tropical fruit export value is still relatively low and tends to fluctuate, indicating challenges in terms of competitiveness and international market access [3].

Global export competition for tropical fruits is intense, especially with major producing countries such as Thailand, the Philippines, and Vietnam. Other challenges include non-tariff barriers, strict quality standards, and limitations in infrastructure and logistics. Therefore, a comprehensive mapping of Indonesia's fruit export competitiveness is needed, as well as a quantitative identification of the main factors affecting it.

In this study, six export destination countries were selected as the focus of research, namely Malaysia, Singapore, China, Hong Kong, Saudi Arabia, and the United Arab Emirates. The selection of these countries is not without reason, as Malaysia and Singapore are major markets as well as neighboring countries that have historically had stable trade relations with Indonesia. Meanwhile, China and Hong Kong

show an increasing trend of tropical fruit demand; OEC (2024) noted that the value of Indonesia's tropical fruit exports to China reached USD 95.3 million in 2023 [4]. Meanwhile, Saudi Arabia and the United Arab Emirates are strategic markets for the Middle East region with high demand for imported fruits due to limited local production [5].

Based on this background, this study aims to assess the competitiveness of Indonesia's tropical fruit exports and identify factors that affect its performance in the global market. The results of this study are expected to be the basis for the preparation of strategies to increase Indonesia's horticultural fruit exports in a sustainable and data-based manner

II. RESEARCH METHODOLOGY

A. Research Design and Scope

This study was prepared using a quantitative approach and an explanatory design. The research focuses on analyzing tropical fruit exports consisting of banana (HS 080390), pineapple (HS 080430), mango, mangosteen, guava (HS 080450), and durian (HS 081060). The scope of the region covers six export destination countries: Malaysia, Singapore, China, Hong Kong, Saudi Arabia, and the United Arab Emirates. The time span of the analysis covers 2013 to 2022.

B. Types and Sources of Data

The data used is secondary and collected in the form of annual time series. The data include export value and volume, GDP, exchange rate, export price, destination country population, and economic distance. Data sources are taken from official and trusted institutions, such as the Central Statistics Agency (BPS), UN Comtrade, World Bank, Food and Agriculture Organization (FAO), WITS, ITC, and CEPII.

C. Analysis Technique

Three analytical approaches were used in this study, namely, Revealed Comparative Advantage (RCA) to measure the comparative advantage of Indonesian fruit exports compared to other countries. Then, export Product Dynamics (EPD) to map the position of the product in the context of global market dynamics, whether it is a rising star, falling star, lost opportunity, or retreat. Furthermore, the Gravity Model is used to determine the influence of economic variables on export performance. We tested different models using Chow and Hausman tests to find out whether a fixed effect or random effect model was better, and we also checked for basic assumptions like normality, multicollinearity, heteroscedasticity, and autocorrelation. Data processing was done using Microsoft Excel and EViews 13 software.

➢ Revealed Comparative Advantage (RCA)

RCA in this study is used to measure the competitiveness and comparative advantage of fruit horticultural commodities, namely bananas, pineapples, mangoes, and durian in Indonesia in the international market. The RCA index, commonly known as the Balassa (1989) index, is an indicator that can describe the comparative advantage (level of competitiveness) of a country's commodities in the global market. So that it can provide output and determine whether Indonesia can compete globally, namely in horticultural commodities of banana, pineapple, mango, rambutan, and durian. The following is the general formula of the RCA method [7].

$$RCA_{ij} = \frac{X_{ij}/X_{it}}{W_j/W_t}$$

Description:

$RCA_{(ij)}$: RCA index for Commodity i from country j

X_{ij} : export value of Indonesian fruit i to destination country

X_{jt} : the total value of Indonesia's exports to destination countries

W_j : the value of world fruit exports to destination countries

W_t : total world export value to destination country

If the RCA index value obtained is more than one (RCA>1), then the country concerned has a comparative advantage above the world average for that commodity.

Export Product Dynamic

Export Product Dynamics (EPD) measures how competitively positioned fruit products are, especially in relation to major importing countries, and thus whether or not they perform well in the global market [8]. Mathematically, the strength of a particular country's export market share in the international market (X-axis) is formulated as follows:

$$\frac{\sum_{t=1}^{t} \left(\frac{X_i}{W_i}\right) t \times 100\% - \sum_{t=1}^{t} \left(\frac{X_i}{W_i}\right) t - 1 \times 100\%}{T}$$

Meanwhile, the market attractiveness or market share of a particular product in the international market (Y-axis) is systematically formulated as follows:

$$\frac{\sum_{t=1}^{t} \left(\frac{X_t}{W_t}\right) t \times 100\% - \sum_{t=1}^{t} \left(\frac{X_t}{W_t}\right) t - 1 \times 100\%}{T}$$

Description:

Xi : Export value of Indonesian product i to destination country

Xt : Total value of Indonesia's exports to destination countries

Wi : World export value of product i to destination country

Wt : Total value of world exports to destination country

T : Number of Years

t : year t

This method is also used to assess whether a product is a dynamic performer or not. Four categories - rising star, falling star, lost opportunity, and retreat - are used to determine the product's competitive position in the destination market.

Table 5 displays the market position matrix, where the Rising Star position means that the product position is strong and the market is also growing, Falling Star is a strong product position, but the market is falling. While Lost Opportunity is a weak product position, but the market is growing, and Retreat is a weak product position and the market is declining.

> *Gravity model*

The gravity model is a suitable model to explain international trade flows because bilateral trade flows are a log-linear function of income and distance [9].

Table 1. Matrix EPD

Share of country's Export in World Trade	Share of Product in World Trade	
	Rising (Dynamic)	**Falling (Stagnant)**
Rising (Competitive)	Rising Star	Falling Star
Falling (Non-Competitive)	Lost Opportunity	Retreat

Source: (Estherhuizen, 2006)

This model can analyze whether trade between the two countries is directly related to the income of each country, and inversely related to trade barriers between the two countries which can be mathematically explained as follows:

$$Y_{ij} = \alpha \frac{X_i X_j}{D_{ij}^2}$$

Description:
Y_{ij} = export flow of country i
X_{i-j} = national income (GDP); X_i is the GDP of country I, and X_j is the GDP of country j.
D_{ij} = geographical distance between the two countries
α = constant

> *Model Estimation*

The estimated model is transformed into the form of ln (natural logarithm) so that the model meets the classical assumption test and avoids the model from bias. In addition, the transformation of the model in the form of natural logarithms can overcome the problem [10]. The export value of Indonesian horticultural fruit products to destination countries is the dependent variable in this study. GDP per capita of destination countries in year t-1, export prices, ER of destination countries, economic distance of destination countries, and population of countries are some of the independent variables used in this study. The model estimation is transformed as follows:

$$Ln(Trade_{it}) = \alpha_0 + \alpha_1 LAGGDP_{it} + \alpha_2 lnEP_{it} + \alpha_3 lnER_{it} + \alpha_4 lnPop_{it} + \alpha_5 lnED_{it} + \epsilon_t$$

Description:
LnEQ : value of trade donen from country i to country j
LAGGDP : GDP_{t-1} of destination country
LnEP : export price of fruit k from country i to country j
LnREER : *Exchange Rate of* destination country
LnPOP : total population of country
LnED : Economic distance between countries
α_0 :
t : time
ϵ : *Term error*

The results of this analysis provide an overview of the main components affecting the amount of Indonesian fruit exports to key destination countries. In addition, the interpretation of the regression results provides a basis for strategic decisions aimed at improving the competitiveness of Indonesian fruit exports in the global market.

III. RESULTS

A. Comparative and Competitive Advantage of Fruits

The results of the RCA and EPD analysis in Tables 21, 23, and 24 show that Indonesia's tropical fruits, including bananas, mangoes, pineapples, and durians, have considerable export potential. However, Indonesia's competitiveness is still low, hindering its ability to compete effectively with major competitors, especially Thailand, the Philippines, India, and Vietnam. The RCA estimation results show that, although there are some markets with values above one (indicating comparative advantage), their number and distribution are still limited. On the other hand, competitor countries show a tendency to have much higher and more consistent RCA values across different target markets. This finding implies that, compared to these countries, Indonesian tropical fruit products have a less competitive global position.

Despite Indonesia's significant market share, EPD estimates show that its export movements and growth fall into the non-dynamic category. This phenomenon is characterized by the dominance of "Falling Star" and "Retreat" positions in most destination countries, including key commodities such as bananas and durian. Simultaneously, competing countries such as Thailand and the Philippines have gained many "Rising Star" positions, indicating that their products not only have a large market share but also show positive and sustained export growth. Such behavior suggests that systematic improvements are needed in Indonesia's competitiveness, not only in terms of export volume but also in terms of growth dynamics and market preferences.

> *Bananas*

In the banana trade sector, Indonesia shows a significant advantage in the Saudi Arabian market, characterized by an impressive RCA value of 8.58. However, its position in the EPD ranking continues to experience a downward trend. Findings show that, despite significant export volumes, there has been no notable growth or strong expansion in market presence. On the other hand, Vietnam, a major competitor has achieved the Rising Star title in the China and Hong Kong markets, demonstrating its success in capitalizing on export growth opportunities. Simultaneously, in neighboring countries such as Malaysia and Singapore, Indonesia continues to lag behind India in terms of both RCA and EPD. This highlights the importance of implementing strategies that focus on improving brand positioning and quality.

Table 2. RCA Value and EPD Position of Indonesian Fruits 2013-2022

Country of destination	Fruit Group							
	Bananas		Mango, Mangosteen and Guava		Pineapple		Durian	
	RCA	EPD	RCA	EPD	RCA	EPD	RCA	EPD
Malaysia	0,578	*Falling Star*	3,012	*Retreat*	0,212	*Falling Star*	1,265	*Falling Star*
Singapore	0,384	*Falling Star*	0,749	*Retreat*	0,595	*Falling Star*	0,024	*Falling Star*
China	0,101	*Rising Star*	1,228	*Rising Star*	0,010	*Rising Star*	0,001	*Lost Opportunity*
Hong Kong	0,047	*Retreat*	35,816	*Falling Star*	1,455	*Falling Star*	0,001	*Retreat*
Saudi Arabia	8,580	*Falling Star*	0,208	*Retreat*	2,974	*Falling Star*	1,967	*Retreat*
UAE	0,454	*Retreat*	1,649	*Retreat*	9,970	*Falling Star*	0,551	*Retreat*

Source: Secondary Data, processed (2024

➢ *Mango, Mangosteen, and Guava Fruit Groups*

Indonesia has significant RCA advantages in the mango, mangosteen, and guava sectors, with a combined total of 35,816 in the Hong Kong market. However, it is important to realize that Indonesia's EPD remains at the "Falling Star" level.

Table 3. Comparison of Average RCA Values of Tropical Fruits of Indonesia and its Competitor Countries in Destination Countries 2013-2022

Importing Country	Exporting Country	Fruit Group			
		Bananas	Mango. Mangosteen. Guava	Pineapple	Durian
Malaysia	Indonesia	0,58	3,01	0,21	1,26
	Indonesia's competitor countries	0,59 (India)	38,76 (Thailand)	30,71 (Philippines)	1,65E+01 (Thailand)
Singapore	Indonesia	0,38	0,74	0,59	0,02
	Indonesia's competitor countries	0,06 (India)	6,20 (Thailand)	38,34 (Philippines)	0.342 (Thailand)
China	Indonesia	0,10	1,22	0,01	0,001
	Indonesia's competitor countries	5.11 (Vietnam)	27,55 (Thailand)	128,68 (Philippines)	33,586 (Thailand)
Hong Kong	Indonesia	0,04	35,81	1,45	0,001
	Indonesia's competitor countries	0.04 (Vietnam)	6,06 (Thailand)	24,41 (Philippines)	21.88 (Thailand)
Saudi Arabia	Indonesia	8,58	0,20	2,97	1,96
	Indonesia's competitor countries	69,64 (India)	12,09 (India)	608,43 (Philippines)	9.31E+00 (Thailand)
UAE	Indonesia	0,45	1,65	9,97	0,55
	Indonesia's competitor countries	1,72 (India)	3,51 (India)	363,93 (Philippines)	23,755 (Thailand)

Source: Secondary Data, processed (2024)

This indicates that Indonesia's exports to this country are stagnant and show no growth in market presence. Thailand has consistently demonstrated its excellence and maintained a stable presence in all target markets. However, the Chinese market stands out as an anomaly in this pattern. Indonesia has achieved "Rising Star" status in both RCA and EPD, indicating that these products are experiencing significant growth and have great potential for future competitiveness.

➢ *Pineapple*

Pineapple is the weakest performing horticultural export product. Indonesia's market comparison analysis shows a significant presence in the United Arab Emirates market, evidenced by an RCA score of 9.970. Indonesia continues to exhibit characteristics associated with the "Falling star" EPD category. The Philippines has established a significant presence in almost all major markets, evidenced by its high RCA values (e.g. 128.68 in China and 608.43 in Saudi Arabia) and "Rising Star" EPD status. This behavior indicates that the Philippines is a major exporter and adept at understanding market dynamics.

Table 4. EPD Calculation Results of Tropical Fruits of Competitor Countries in Destination Countries 2013-2022

Country of Destination	Fruit Group			
	Bananas	Mango, mangosteen, and guava	Pineapple	Durian
Malaysia	*Lost Opportunity* (India)	*Falling Star* (Thailand)	*Lost Opportunity* (Philippines)	*Falling Star* (Thailand)
Singapore	*Falling Star* (India)	*Falling Star* (Thailand)	*Retreat* (Philippines)	*Falling Star* (Thailand)
China	*Rising Star* (Vietnam)	*Falling Star* (Thailand)	*Rising Star* (Philippines)	*Retreat* (Thailand)
Hong Kong	*Rising Star* (Vietnam)	*Falling Star* (Thailand)	*Rising Star* (Philippines)	*Retreat* (Thailand)
Saudi Arabia	*Falling Star* (India)	*Retreat* (India)	*Retreat* (Philippines)	*Retreat* (Thailand)
United Arab Emirates	*Retreat* (India)	*Retreat* (India)	*Falling Star* (Philippines)	*Falling Star* (Thailand)

Source: Secondary Data, processed (2024)

➢ *Durian*

The results of the durian analysis highlight a significant gap between the ambitions of industry players and the tangible results of their efforts. Although, Indonesia's durian production is sizable, RCA values in various markets remain low, with estimates reaching only 0.001 in China and Hong Kong. EPD positions are mostly classified in the "Retreat" and "Lost Opportunity" categories, indicating that the untapped market potential is still large. Thailand, recognized as the world's largest durian exporter, maintains a strong presence in RCA and EPD in almost all destination markets. This situation suggests that durian export development in Indonesia is still in its infancy and requires substantial policy measures to improve competitiveness.

Overall, the findings suggest that Indonesian tropical fruit products are currently unable to compete effectively in the global market. Improving product quality, export logistics, branding, and diversifying target markets are essential to increase sustainable competitiveness. Cooperation between the government and businesses must be enhanced synergistically to ensure that the benefits of local production can be transformed into real opportunities in global trade.

B. *Factors Affecting the Export Value of Fruits*

Factors affecting the export demand of Indonesian fruits to the main destination countries are destination country GDP, export price, Indonesia's exchange rate against USD, economic distance, and destination country population, which can be seen in Table 4. Meanwhile, the regression results generated from each fruit are Random Effect Model (REM), except pineapple. This is because the probability value generated by banana, mango, mangosteen, guava fruit groups, and durian is greater than 5% so that H0 is accepted. Thus, REM is better than the Fixed Effect Model (FEM).

The R-squared value contained in table 4 means that each independent variable contained in the model can explain 77.28% (banana), 79.75% (mango, mangosteen, and guava), 72.857% (pineapple), and 73.96% (durian), and the rest is explained by other factors outside the model. This is used to see the presence of heteroscedasticity. If the R-squared value is greater than the real level of 5%, then H0 is accepted or there is no heteroscedasticity. The model assumption test value has met the classic assumption of normality with the probability being above the 5% real level. The Durbin-Watson value is at number two; this indicates that it is free from autocorrelation. The value of the correlation matrix shows a value above 0.8, so these models are free from multicollinearity.

➢ *Gross Domestic Product (GDP) of the Country*

The GDP of the destination country serves as the primary measure of purchasing power for imported commodities. In gravity models, GDP often has a positive influence on exports, as an increase in income generally increases demand for consumer goods, such as tropical fruits [11]. The regression analysis in this study shows that GDP has a positive and significant influence on exports of bananas as well as the combined categories of mangoes, mangoes, and guavas. This suggests that a 1% increase in destination country GDP results in an increase in the export value of each commodity, although the effect is quantitatively small as GDP is represented in large units (million USD).

However, there are significant exceptions for pineapple and durian. The LAGGDP coefficient for pineapple is negative (-5.88E-14) and not statistically significant. An increase in destination country GDP does not automatically increase demand for Indonesian pineapples and may not be significant. Firstly, major pineapple exporting countries such as the Philippines already dominate the market thanks to strong distribution networks and recognized quality, so purchasing power in partner countries is likely to be diverted to competing products. Secondly, buyers in high GDP countries generally prefer fruits that meet certain quality and certification criteria, which Indonesian pineapples have not fully met. The pattern is similar to the study of [12], where certain horticultural commodities do not show a positive response to economic growth in partner countries unless supported by quality advantages and a competitive marketing framework.

➢ *Price*

Export prices serve as a critical indicator of a product's price competitiveness in the international market, and an increase in price would theoretically reduce the amount of exports if demand is elastic. Regression analysis shows that

the export price variable significantly affects all commodities, although the nature of the effect varies. Banana prices have a negative effect, indicated by the coefficient of -0.80. A 1% increase in price leads to a 0.80% decrease in the value of banana exports. This indicates that the commodity has price elasticity, meaning that consumers tend to switch to other alternatives in response to price increases.

For the mango, mangosteen, guava, pineapple, and durian fruit groups, price has a positive and significant effect on exports, with coefficients of 1.02, 2.47, and 0.95, respectively. This indicates that these fruits are classified as high value-added or premium products, where an increase in price does not reduce demand and could even potentially increase it. In destination countries, such as China or the UAE, consumers may prioritize the perceived quality of the mango, mangosteen, guava, pineapple, and durian fruit groups over price, as explained by the Veblen Effect Theory [13]. Therefore, export strategies for these commodities should prioritize improving quality and differentiation rather than simply lowering prices.

Table 5. Estimation results using the Gravity Model for Indonesian Fruits

Variables	Dependent variable: LnQE			
	Bananas	Mango, mangosteen and guava group	Pineapple	Durian
	REM	REM	FEM	REM
C	[34,12894]	[33,86138]	[-157,7211]	[-94.51045]
	0,4257	0,1563	0,0004	0,0005
LAGGDP	[4,79E-13]	[6,59E-13]	[-5,88E-14]	[-3.99E-13]
	0,0429	0,0000	0,6616	0,0003
LnEP	[-0,804674]	[1,017010]	[2,471438]	[0.954146]
	0,0486	0,0047	0,0259	0,0002
LnER	[-0,342611]	[-0,082230]	[16,38957]	[8.626313]
	0,9333	0,9725	0,0004	0,0017
LnEDISTC	[-0,640977]	[-0,756046]	[1,333484]	[-1.768667]
	0,4197	0,1140	0,0005	0,0001
LnPOP	[-0,797430]	[1,369312]	[-0,654576]	[1.422433]
	0,4670	0,0009	0,0616	0,0002
R-squared	0,772860	0.797578	0,728516	0.739619

Source: Secondary Data, processed (2024)

➢ *Exchange Rate*

Exchange rates are a critical factor in international trade as they affect the price competitiveness of exported goods. Depreciation of the destination country's currency or appreciation of the exporting country's currency results in a decrease in the price of export products, which in turn increases demand. Regression analysis shows that the exchange rate has a significant positive impact only on pineapple (coefficient 16.38) and durian (coefficient 8.63). If the destination country's currency weakens by 1%, Indonesia's pineapple and durian exports will increase significantly. This effect suggests that the price competitiveness of these two commodities is strongly influenced by exchange rate fluctuations, especially in markets with strong price preferences such as Hong Kong and the UAE.

In contrast, the effect of the exchange rate on bananas and mangoes is not significant and even tends to be very small (probability value > 0.9). This suggests that export demand for these two commodities is not significantly affected by exchange rate fluctuations, possibly due to large sales volumes at low prices and thin margins. Non-price factors, including market access, delivery speed, and bilateral trade relationships, may have a greater influence than the exchange rate effect. Reference [14] found that the sensitivity of exports to exchange rates is significantly affected by market structure and dependence on imported inputs.

➢ *Economic Distance*

Economic distance is a variable often used in gravity models of trade to represent physical barriers and distribution costs between exporting and importing countries. In the context of horticultural exports, an increase in distance generally has a negative impact on export volumes as products such as tropical fruits are perishable and require specialized logistical handling. The regression results indicate that this variable has a negative and significant impact on banana, mango, and durian exports. Quantitatively, a 1% increase in economic distance reduces durian exports by 1.77%, mango exports by 0.76%, and banana exports by 0.64%. These results are consistent with the theory proposed by [15] that distance is an important determinant of nontariff barriers (NTBs) to agricultural exports, especially for fresh fruits.

However, different results were found for pineapple, where economic distance had a positive and significant effect (coefficient 1.33). This means that a 1% increase in distance correlates with a 1.33% increase in Indonesian pineapple exports. The structure and characteristics of the pineapple export market explain this result, which appears to defy the gravity model's expectations. Major pineapple export destinations such as the United Arab Emirates and Saudi Arabia have large economic distances but are active markets that absorb pineapples for consumption and industrial purposes. In addition, importers in these regions tend to have strong logistics networks and integrated supply chains that can reduce distribution frictions. This phenomenon shows that under certain conditions, distance is not always a barrier,

especially when the destination country has high purchasing power, logistical efficiency, and specific product preferences. Reference [16] also found similar cases for some export commodities from developing countries.

➢ *Population*

The population of the destination country indicates the potential market demand for imported goods. A larger population theoretically correlates with a larger consumer base, especially for staple goods such as fresh fruit. The results from the gravity model estimation show that population has a positive and significant influence on mango and durian exports. The regression coefficients of 1.36 and 1.42 indicate that a 1% increase in destination country population correlates with a 1.36% and 1.42% increase in export value, respectively. Indonesia's mango and durian exports are significantly affected by the size of potential consumer markets. Countries such as China and India, which have large populations, offer significant export opportunities, especially given their growing middle classes and consumption patterns that increasingly favor tropical products.

This finding is in line with study [17], which shows that export volumes to densely populated countries are generally larger, especially when accompanied by a large GDP. Reference [18] shows that demand for tropical fruits has increased significantly in major developing countries, driven by growing awareness about healthy diets and diversification of food consumption patterns. For commodities such as bananas and pineapples, population size does not significantly affect demand due to different consumption patterns, the presence of local substitutes, or limited market penetration.

IV.　CONCLUSIONS AND SUGGESTIONS

A. Conclusions

Indonesia's tropical fruit export competitiveness still varies between commodities and destination countries. Mango shows the most consistent comparative advantage, while banana and durian are still limited. *The rising star* position is found for mangoes and bananas in China, while pineapple and durian are generally in the *falling star* or *retreat* category. This suggests that export opportunities have not been optimally utilized, especially amidst the dominance of Thailand and the Philippines.

In general, the main factors affecting exports are GDP and economic distance. Durian and mango are sensitive to GDP, population, and export prices, while pineapple is influenced by exchange rates and shows an anomalous positive relationship with distance reflecting market specificity, such as the UAE. The impact of price and exchange rate variables is more specific to each commodity and market structure.

B. Suggestionss

The government needs to encourage tropical fruit exports in a targeted manner by commodity and destination country. Durian and banana need to improve price competitiveness and quality, mango needs to be expanded to

large population markets, while pineapple needs logistics strengthening for long-distance markets.

The main objectives of policy interventions should aim to improve farmers' capabilities, simplify regulations, and reduce distribution barriers. To compete in the global export market, Indonesia needs to improve its data-driven market mapping and promotion strategies.

REFERENCES

[1]. Central Bureau of Statistics. (2023). Indonesia Gross Domestic Product by Business Field. https://www.bps.go.id

[2]. Ministry of Agriculture of the Republic of Indonesia. (2022). National Horticulture Statistics 2022.

[3]. Kanaya, S. & Firdaus, M. (2014). Competitiveness and Export Dynamics of Indonesian Horticultural Products. Bogor Agricultural University.

[4]. OEC World. (2024). Tropical Fruits in Indonesia Export. Retrieved from: https://oec.world

[5]. TrendEconomy. (2023). Indonesia - Export of Edible Fruit and Nuts. https://trendeconomy.com

[6]. Balassa, B. (1989). NolandM (1989) Revealed comparative advantage in Japan and the United States. *Journal of International Economic Integration, autumn*.

[7]. Sarath Chandran, B. P. (2010). Trade Compatibility Between India And Asean Countries.

[8]. Muhammad, F. And Kanaya, I.A., 2014. Competitiveness and Export Demand of Indonesian Biopharmaca Products in Major Destination Countries for the Period 2003-2012 Irgandhini Agra Kanaya *)1 And Muhammad Firdaus *). *Journal of Management & Agribusiness*, 11(3), Pp.183-198.

[9]. Feenstra, R., J.A. Markusen and A.K Rose (1999): "Using the Gravity Equation To Differentiate Among Alternative Theories Of Trade", downloaded 1.2.2008, http://haas.berkeley.edu/~aroseS, pp. 1 - 28.

[10]. Juanda, B., 2009. *Econometrics Modeling and Estimation*. Bogor: IPB press.

[11]. Anderson, J.E. and van Wincoop, E., 2003. Gravity with gravitas: A solution to the border

[12]. Wulandari, P., & Budiasih, L. (2009). The Effect of Real GDP on Indonesian Horticultural Exports. *Journal of Agroeconomics*, 27(2), 145-160. https://ejournal.bappenas.go.id/index.php/JAE

[13]. Krugman, P. R., & Obstfeld, M. (2009). *International Economics: Theory and Policy* (8th ed.). Pearson Education.

[14]. Arize, A. C., Malindretos, J., & Igwe, E. U. (2017). Do Exchange Rate Changes Improve the Trade Balance? Evidence from Selected ASEAN Countries. *International Review of Economics & Finance*, 50, 251-262. https://doi.org/10.1016/j.iref.2017.04.004

[15]. Anderson, J.E. and van Wincoop, E., 2003. Gravity with gravitas: A solution to the border

[16]. CEPII. (2022). *Distance and Trade Costs Database*. Center d'Études Prospectives et d'Informations Internationales. https://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6

[17]. Helpman, E., Melitz, M., & Rubinstein, Y. (2008). Estimating Trade Flows: Trading Partners and Trading Volumes. *Quarterly Journal of Economics*, 123(2), 441-487. https://doi.org/10.1162/qjec.2008.123.2.441

[18]. World Bank. (2023). *World Development Indicators - Population, GDP, Exchange Rate*. https://data.worldbank.org