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RESEARCH ARTICLE

INDONESIAN CURCUMA COMPETITION IN THE WORLD MARKET: INSIGHT FROM DEMAND SYSTEM ANALYSIS

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ARTICLE INFO	ABSTRACT
          	Curcuma is frequently employed as an appetite enhancer and for medicinal purposes. In addition to being consumed domestically, Indonesian curcuma is also exported to the global market. This research identifies the manner in which Indonesian curcuma competes in the worldwide market, taking into account the fact that it also competes with curcuma from various other countries. The market position of Indonesian curcuma is identified using the Almost Ideal Demand System (AIDS) method. The comparator countries selected for this study are five curcuma exporters, namely India, the Netherlands, Germany, Spain, and the USA. The analysis utilised time series data from January 2013 to December 2022, and the identification results of this study indicate that Indonesian curcuma is a normal good with elastic and responsive properties to the global demand for curcuma. Furthermore, it is observed that Indonesian curcuma substitutes or replaces Indian curcuma. Conversely, Dutch, German, Spanish, and USA curcuma exhibit a complementary relationship with Indonesian curcuma. To enhance the competitiveness of Indonesian curcuma in the global market, it is imperative to augment the volume and quality of exports, with a particular focus on standardisation and enhancing the added value through processing. This strategic approach is expected to not only ensure price competitiveness with other exporters but also to expand the share of Indonesian curcuma exports in the global market.

INTRODUCTION

Curcuma is a valuable and beneficial herbal plant. Curcuma is reputed to enhance appetite and stamina, and is celebrated for its anti-cancer properties (Tomeh et al., 2019; Hassan et al., 2019; Gomathi et al., 2024). Even during the pandemic, curcuma was employed as a potential treatment for COVID-19 due to its nano-curcumin content, which has been demonstrated to possess anti-inflammatory properties (Valizadeh et al., 2020). One example of an area in which the cultivation of curcuma is practised is in Muaro Regency, specifically in the village of Ibru (Damayanti et al., 2024). Curcuma is frequently consumed by the general public,

either in powdered form or as a processed herbal medicine. Apart from being used domestically for medicinal drinks and appetite stimulants, Indonesian curcuma is also exported to meet international demand. Indonesian curcuma commodities also demonstrate high competitiveness in the international market (Megagita et al., 2021). This is a positive situation for Indonesia.
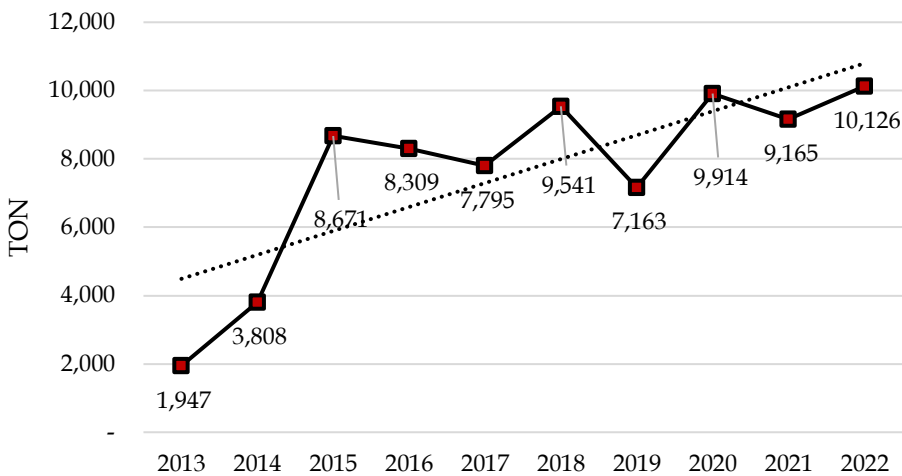

Figure 1.
Indonesia Curucma Export Quantity 2013-2022
Source: International Trade Centre, 2024

A review of Indonesian curcuma exports (Figure 1) reveals a relatively positive trend in export volume. There was a notable increase in curcuma exports, amounting to 1,947 tonnes in 2013 and 8,671 tonnes in 2015 (Figure 1). Although fluctuations were observed in the subsequent year, Indonesia's curcuma export volume reached its highest point in 2022, with a total of 10,126 tonnes of curcuma exported. The rise in Indonesian curcuma exports can be attributed to the growing demand from India, which represents the primary market for Indonesian curcuma. The surge in Indian demand can be attributed to the prominence of the Atharva Veda, a revered text among the majority of Indian Hindu (Paleker, 2023). The Indian people utilise curcuma as a food spice, in household rituals, as a medicine and in skin care. India represents the largest destination country for Indonesian curcuma exports, with export figures reaching 8,163 tonnes in 2018 (Figure 1). It is recommended that the Indonesian government utilise the wide-open potential by building a special partnership with India regarding curcuma exports. Several other countries also export curcuma, including India, the Netherlands, the United States, Spain, and Germany. This creates a competitive environment for curcuma exporters.

The export value of Indonesian curcuma is relatively low in comparison to Indian curcuma, which represents a significant player in the global curcuma export market (Figure 3). The export value of Indonesian curcuma tends to exhibit a downward trend, with the export value of Netherlands curcuma exceeding that of Indonesian curcuma during the period from 2013 to 2018 (Figure 3). The decline in the value of Indonesian curcuma exports was attributable to a reduction in the price

of Indonesian curcuma and an increase in the quantity of curcuma exports (Figure 4). Conversely, a reduction in global demand for curcuma resulted in a decline in the value of Indonesian curcuma exports. In 2018, the quantity of Indonesian curcuma exports was 15,041 tonnes, representing a significant increase from the previous year (International Trade Centre, 2024). This increase was influenced by a significant rise in production, with Indonesia's curcuma production reaching 25,571 tonnes in 2018 and 29,637 tonnes in 2019 (Central Statistics Agency, 2024). The highest peak of Indonesia's curcuma export value was observed in 2017, reaching 12,956 thousand US dollars.
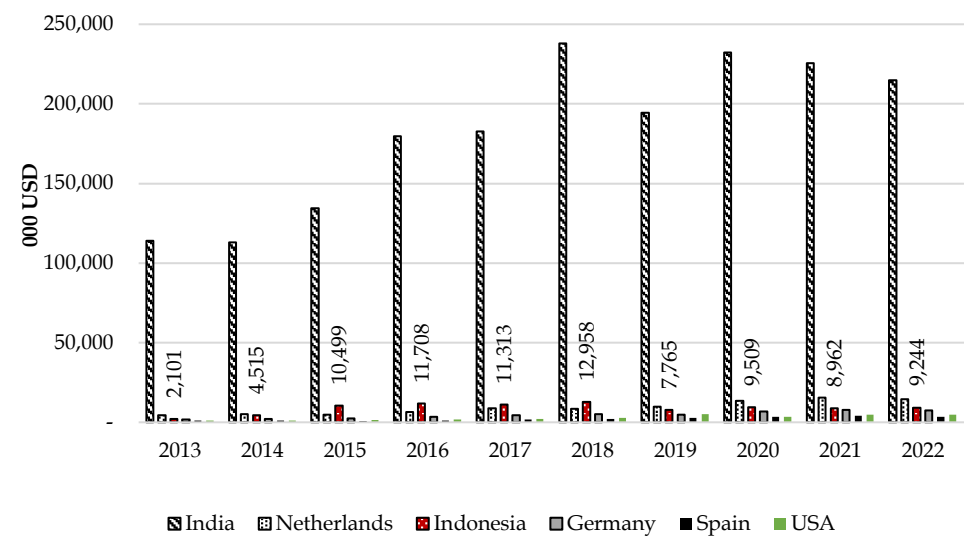

Figure 2.
Indonesia's Curcuma Export Value With Competitor Countries
Source: International Trade Centre, 2024

As illustrated in Figure 3, India is one of the leading exporters of curcuma, with a market share of 74%. Indonesia has a lower share than India, at 4%, while the Netherlands has the third-largest share after Indonesia, at 3% (Figure 3). In 2021, India recorded exports of curcuma in the amount of 153,551 tonnes, with a total value of 225,535.94 thousand US dollars. In comparison, Indonesia exported only 9,165.47 tonnes of curcumae, with a total value of 8,962.22 thousand US dollars (International Trade Centre, 2024). It is noteworthy that India serves as the primary destination for Indonesian curcuma exports, yet it is also the leading global exporter of this spice. This situation arises due to the inability of India to meet its domestic demand for curcuma, given that a significant proportion of the population uses it daily, while the country's export demand for this spice is considerable. Consequently, India must import curcuma to meet its domestic requirements.
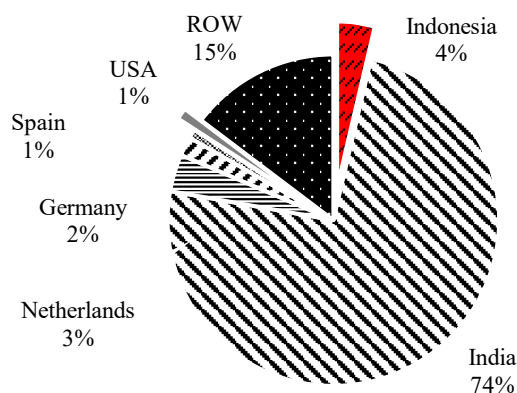
Figure 3.
Market Share of Curcuma Exporters in The International Market
Source: International Trade Centre, 2024

As Mohit Singla, the chairman of the Trade Promotion Council of India (2019), stated, India is a significant producer, consumer, and exporter of curcumin. Curcumin is a compound present in the plant species Curcuma and Turmeric. Curcuma is employed by the pharmaceutical industry for a variety of purposes, including the treatment of cancer and the production of cosmetics. The elevated demand for curcuma in India has resulted in the importation of this commodity from Indonesia. Similarly, the CBI Ministry of Foreign Affairs (2023) asserts that the Netherlands is a prominent exporter and importer of curcuma on the global stage. It is reported that 63% of the Netherlands' curcuma imports are re-exported to various countries in Europe, including Germany, Spain, France and Belgium.

In their research, Pinto et al., (2022) examine the export competition faced by a particular spice commodity, namely Indonesian cloves, in the global market. The Almost Ideal Demand System (AIDS) was selected as the analytical tool to identify the competitive landscape for clove exporters. Competition may be identified through the results of cross-price elasticity between countries. Should the result be positive, indicating substitution between products, it can be inferred that the two countries are engaged in competitive behaviour. Conversely, suppose the result is negative, reflecting complementarity between products. In that case, it can be concluded that the two countries are not engaged in competitive behaviour, given that the two products are complementary, rather than substitutable. The necessity for this research stems from its aim of examining the export potential of Indonesian temulawak in the international market, as well as the competition between exporters, with a view to developing the most appropriate trade strategy for the Indonesian temulawak commodity. The study is of particular interest in relation to ascertaining the competitive position of Indonesian, German, Dutch, Spanish, USA and Indian curcuma exports in the international market.

RESEARCH METHOD

This research employs secondary data from 2013 to December 2022. The data, in the form of time series data from 2013 to 2022, was obtained from a number of sources, namely the United Nations Comtrade database and the International Trade Centre (ITC) Trade Map. The data set comprises quantities of curcuma (in kilograms) and the export values (in thousands of dollars) for the period 2013-2022. The price data was calculated by multiplying the export quantity by the export value. The HS code of curcuma employed in this study is 091030, which corresponds to turmeric (Curcuma).

In order to address the aforementioned objectives, the Almost Ideal Demand System (AIDS) method will be employed. This approach enables the identification of competition between countries through the examination of expenditure elasticity, own price elasticity, and cross-price elasticity for each predetermined exporter (India, Indonesia, the Netherlands, Germany, and Spain). The selection of comparison countries is based on the five primary exporters of curcuma in the global market. The selection of the AIDS model is predicated on its capacity to examine demand for goods and consumer behaviour, its compatibility with microeconomic theory, and its interpretive simplicity (Deaton & Muellbauer, 1980). Similar research has been conducted using the AIDS method, as evidenced by Fortunika et al., (2021), who applied the method to investigate the position of Indonesian robusta coffee. Research conducted by Dewanti et al. (2020) also employed the AIDS model to identify Indonesia's coconut oil competition with other exporters. Other researchers who also apply the AIDS model to analyze Indonesia's export demand include Nasution et al., (2024) for coffee, Natalia et al., (2024) for pulp, Anggrasari, et al (2023) for coconut oil, and Rifin (2023) for palm oil.

Furthermore, the AIDS model can ascertain the degree of elasticity of a product within a specific market. This is in addition to research conducted by Suryanty & Reswita (2016); Li et al., (2018); Bougherara et al., (2022); Lindström (2022); and Salsabila et al., (2023), who sought to analyse the elasticity of organic dairy products. The AIDS method is represented by a formulaic model, which can be described as follows:

$$W_i = a_i + \sum_{j=1}^{n} Y_{ij} \ln P_j + \beta_i \ln\left(\frac{x}{p*}\right)..........(1),$$

Description: Wi = Export share of the i-th exporting country in the International market; P = Exporting country's origin price; x = Total import value in the International market; p* = Geometric price index; stone = $\sum$ 〖w_i .p_i〗

This research examines Indonesia's exports of the spice turmeric, with competitor countries, namely India, the Netherlands, Germany, Spain, the United States of America, and the Rest of the World (ROW). Consequently, the study comprises seven equations, each of which elucidates the curcuma exports of India, the Netherlands, Germany, Spain, the United States of America, and the Rest of the World (ROW). The AIDS model equation was initially proposed by Deaton & Muellbauer (1980), who investigated product demand. This model employs price as the primary independent variable, facilitating the linkage between demand and supply. The outcomes of the AIDS model must satisfy the criteria of homogeneity,

symmetry, and additivity. The following presents the formulaic representation of these three requirements:

Homogenity

The principle of homogeneity stipulates that if a change occurs in revenue or price and the proportion is the same, then the amount of demand for a given commodity will remain constant. This scenario exemplifies the application of a homogeneous demand function with a price and demand coefficient of zero.

$$\sum_{j=1}^{n} Y_{ij} = 0........(2),$$

Symetry

The term symmetry can be defined as the cross-price reduction property of demand symmetry. This can be expressed as follows:

$$Y_{ij} = Y_{ji}........(3),$$

Adding Up

One of the conditions describing total expenditure in the demand function is that it is equal to total income.

$$\sum_{i=1}^{n} a_i = 1, \sum_{i=1}^{n} Y_{ij} = 0, \sum_{i=1}^{n} \beta_i = 0.......(4),$$

Once the regression results have been processed to ensure they meet the requisite criteria of homogeneity, symmetry, and summation, the results of the AIDS model regression coefficient are then applied to the elasticity formula. Elasticity can be classified into three categories: income elasticity (expenditure), demand price elasticity (uncompensated), and cross-price elasticity (compensated). The cross-price elasticity enables an analysis of the competitive landscape among curcuma-exporting countries in the international market. The following section presents the formulas for the three elasticities.

Income Elasticity (Expenditure)

$$\eta_i = 1 + \frac{\beta_i}{w_i}........(5),$$

Cross Price Elasticity (Compensated)

$$e^*_{ij} = -\delta_{ij} + \frac{Y_{ij}}{w_i} - w_j........(6),$$

Price Elasticity of Demand (Uncompensated)

$$e_{ij} = -\delta_{ij} + \frac{Y_{ij}}{w_i} - \beta_i \left(\frac{w_j}{w_i} \right).........(7),$$

Where Knocker delta when $i=j$ then $= 1$, otherwise $0 : \delta$

RESULT AND DISCUSSION

Curcuma is a medicinal plant that has been demonstrated to possess in vitro antioxidant activity, which may potentially inhibit the entry of free radicals into the body (An et al., 2020). The antioxidant and anti-inflammatory activities present in curcuma can enhance the efficacy of phenolic compounds in combating a range of diseases that can affect humans (Choi et al., 2020). It has also been demonstrated to enhance autoimmune activity and inflammation in patients diagnosed with systemic lupus erythematosus (SLE) (Sedighi et al., 2025). Historically, curcuma has been utilised as a component of traditional medicine, with applications ranging from the treatment of indigestion and pain to the management of wounds and inflammation, as well as the prevention of cancer (Dosoky & Setzer, 2018). In the livestock sector, curcuma is utilised as a supplement in poultry farms to enhance egg quality, augmenting antioxidant activity, and reducing cholesterol levels (Hanif et al., 2025). It is therefore unsurprising that a considerable number of requests are received from both domestic and international sources. The considerable number of requests, particularly from the global market, necessitates the identification of elasticity and the relationship between Indonesian curcuma and curcuma from other competing countries. The following section presents the results of identifying the elasticity and relationship of Indonesian curcuma with competing countries using the AIDS model.

Table 1. Coefficients and p-values of Indonesian, Indian, Netherlands, German, and Spanish curcuma exporters in the International Market

Equation	"R-sq"	P-Value
Qina	0.0614	0.0055
Qind	0.1447	0.0000
Qbel	0.2541	0.0000
Qjer	0.3351	0.0000
Qspa	0.3984	0.0000
Qusa	0.1339	0.0008

The results presented in Table 1 demonstrate that the p-value for the five curcuma exporting countries, namely Indonesia, India, the Netherlands, Germany and Spain, has a value of 0.0000, which is less than 0.05. This indicates that the p-value is statistically significant at the 5% level, suggesting that the independent variables collectively can explain the dependent variable, namely the share of curcuma exports from Indonesia, India, the Netherlands, Germany, the United States of America and Spain to the global market.

Figure 4 illustrates the price of curcuma in Indonesia, the Netherlands, Germany, Spain, and the USA from 2013 to 2022. A comparison of the average price of Indonesian curcuma with that of other countries reveals that it has been lower since 2015-2022. The average price of Indonesian curcuma in the international market has exhibited a downward trajectory since 2018-2022 (Figure 4). The price of Netherlands and Spanish curcuma has exhibited an upward trend, although it experienced a price decline in 2022. To identify the competitive landscape between Indonesian curcuma and Indian, Netherlands, German, Spanish, and USA curcuma,

a three-elasticity analysis was conducted. The analysis encompassed expenditure elasticity, own price elasticity, and cross-price elasticity.
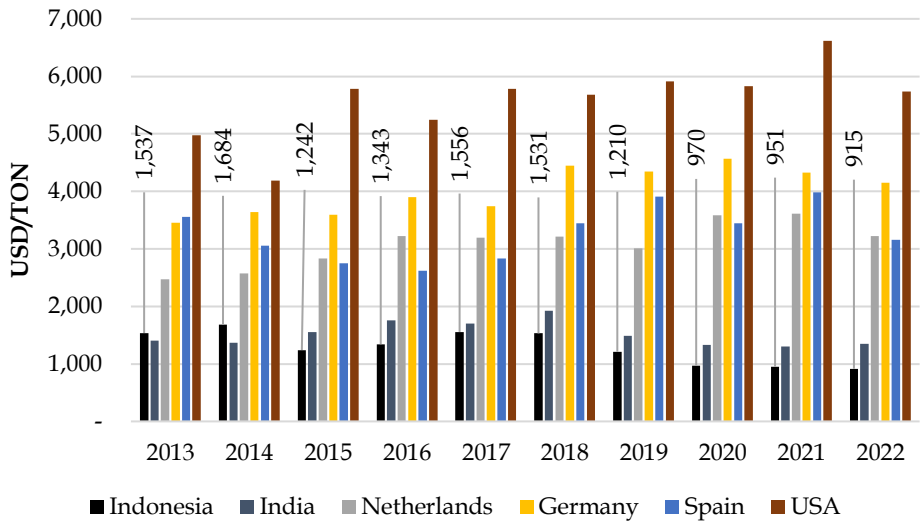

Figure 4.
Average price of curcuma in Indonesia, India, Netherlands, Germany, Spain, and USA 2013-2022
Source: International Trade Centre, 2024

Export Curcuma Income Elasticity of Indonesia and Major Exporters

Income elasticity is a metric used to ascertain the responsiveness of demand for a commodity to fluctuations in consumer income (Baye & Prince, 2022). It is calculated by dividing the percentage change in quantity demanded by the percentage change in consumer income. In this study, consumer income is assumed to be the total world curcuma exports, thereby inferring that a change in the latter will result in a corresponding change in demand for curcuma exports from curcuma-exporting countries.

Table 2.   Income Elasticity (Expenditure) of Six Curcuma Exporting Countries in The International Market

Countries	Income Elasticity
Indonesia	0.976
India	0.973
Netherlands	1.066
Germany	1.167
Spain	1.035
USA	1.193

As illustrated in Table 2, the results of the model identification of expenditure elasticity values for Indonesia, India, the Netherlands, Germany, Spain and the USA

are presented. It is evident from the data that all six countries exporting turmeric to the global market have positive values, thereby indicating that the turmeric goods they export are classified as normal goods (Baye & Prince, 2022). This value is analogous to those observed in other spice commodities, including Indonesian nutmeg exports and other export products such as processed tobacco (cigars), refined palm oil, and coffee beans, which also exhibited positive values (Aulia et al., 2019; Manalu et al., 2020; Fortunika et al., 2021; Pinto et al., 2022; Yafi et al., 2024). Consequently, an increase in consumers' income worldwide will positively impact demand for curcuma in Indonesia, India, the Netherlands, Germany, Spain and the USA. The income elasticity value of Indonesian and Indian curcuma products is below one, indicating that an increase in income will result in a smaller percentage increase in curcuma product spending compared to the percentage increase in income. Conversely, the income elasticity value for Dutch, German, Spanish and USA curcuma products exceeds one, signifying that an increase in income among global curcuma consumers will result in a higher percentage increase in demand for curcuma compared to the percentage increase in income.

The results of the expenditure elasticity analysis, as presented in Table 2, indicate that an increase in income by 10% (ceteris paribus) will lead to a 9.76% increase in demand for curcuma exports from Indonesia. This value of expenditure elasticity is represented by the coefficient of 0.976. The elasticity result for curcuma USA is 1.193 (Table 2), indicating that a 10% increase in global consumer income (ceteris paribus) will result in a 11.93% increase in demand for curcuma USA. The highest income elasticity value is observed in the United States, with a value of 1.193. This suggests that an increase in the global export value of turmeric will have a greater impact on the United States than on other countries, such as Cuba, which produces cigars. The elasticity of demand for turmeric in the USA is 1.193 (Table 2), indicating that a 10% increase in global consumer income will lead to a 11.93% increase in demand for turmeric in the USA.

Export Curcuma Cross-Price Elasticity of Indonesia and Major Exporters

Cross-price elasticity is a measure of the responsiveness of demand for a good to changes in the price of a related good (Baye & Prince, 2022). Price elasticity is calculated as the percentage change in demand for a good, subsequently divided by the percentage change in the price of the related good. In this study, the related goods are assumed to be curcuma from other exporters, thereby enabling an examination of the cross-price elasticity of curcuma demand in country X to changes in the price of curcuma from country Y.

The examination of cross-price elasticity facilitates the analysis of the relationship between the two goods, in this case, curcuma, within the context of exporting countries. The existence of competition between curcuma is determined by the nature of the relationship between the two goods. The existence of competition is described if the two goods have a substitution relationship; in contrast, if the two goods only have a complementary relationship, it means that the two goods describe the absence of direct competition. The substitution relationship is indicated by a positive value in the cross-price elasticity value, while a negative value is indicative of a complementary relationship. The subsequent section will present the results of the cross-price elasticity value of curcuma exporters in the international market.

The results of the cross-price elasticity or compensated analysis can be employed to examine the relationship between each exporter's curcuma products in the international market. Furthermore, this relationship enables the examination of the extent to which demand will increase or decrease as a consequence of price changes in other countries. There is a substitution relationship between Indonesian and Indian curcuma. This is indicated by the value of the cross-price elasticity being greater than zero (Baye & Prince, 2022). The existence of a substitution relationship between the two products suggests the presence of competition. The relationship between Indonesian curcuma and curcuma in the Netherlands, Germany, Spain, and the USA can be characterised as complementary, or as a complementary product. This is evidenced by the cross-price elasticity of Indonesian curcuma with the four countries in question being less than zero (Baye & Prince, 2022). It would be prudent for Indonesian curcuma exporters to monitor the price movements of Indian curcuma more closely, given that Indian curcuma represents a potential substitute for Indonesian curcuma.

Table 3. Cross Price Elasticity Results (Compensated) of Six Curcuma Exporters in The International Market

Countries	Indonesia	India	Netherlands	Germany	Spain	USA
Indonesia	-	2.701	-0.282	-0.228	-0.160	-0.112
India	0.133	-	-0.023	-0.007	-0.012	0.128
Netherlands	-0.285	-0.463	-	0.429	0.005	1.088
Germany	-0.449	-0.287	0.839	-	0.178	0.216
Spain	-0.680	-1.047	0.023	0.384	-	1.664
USA	-0.362	-0.479	0.318	0.373	0.531	-

The cross-elasticity value of Indonesian curcuma with India is 27.01 (Table 3). This situation demonstrates that an increase in the price of Indian curcuma by 10% (ceteris paribus) will result in a 27.01% increase in demand for Indonesian curcuma. The rise in the price of curcuma exported from India would have a beneficial impact on Indonesia. Conversely, an increase in the price of Indonesian curcuma by 10% (ceteris paribus) had a relatively limited effect on the increase in India's export demand, which was only 1.33%.

Export Curcuma Demand Price Elasticity of Indonesia and Major Exporters

The own price elasticity of demand is a tool used to measure the responsiveness of changes in quantity demanded due to price changes. The own price elasticity of demand is described by the percentage change in quantity demanded divided by the percentage change in the price of goods. The goods under consideration in this study are turmeric exported to the global market. The value of own price elasticity of demand must be negative, or can be termed the negativity requirement. The absolute value of the own price elasticity of demand is divided into three categories. The first category is characterised by an absolute value greater than one, indicating that the good is elastic or sensitive to price changes. If the elastic value approaches infinity, the good is said to possess perfect elastic properties, tending to remain unsold even in the face of a minor price increase. The second category is defined by an absolute value of one, classifying the good as unitary. The third

category is characterised by a value below one, denoting inelasticity to price changes. However, suppose the elasticity value is equal to zero. In that case, it can be concluded that the good is perfectly inelastic, and the consumer will continue to purchase the item even in the presence of a nominal increase. The following are the results of the own price elasticity of demand value of the main exporters' curcuma prices in the international market.

Table 4. Demand Price Elasticity (Uncompensated) of Six Curcuma Exporting Countries in The International Market

Countries'	Own Price Elasticity of Demand
Indonesia	-1.607
India	-0.899
Netherlands	-0.754
Germany	-1.297
Spain	-0.359
USA	-0.807

The results of the analysis of own price elasticity or demand (uncompensated) demonstrate that the exportability of curcuma in the international market is negative (Table 4). This suggests that an increase in the price of curcuma products in each country will result in a reduction in demand for curcuma in each country. This outcome aligns with the tenets of demand theory, which posits that a price increase will lead to a reduction in demand for a given product (Baye & Prince, 2022). The results demonstrate that the demand for curcuma in Indonesia and Germany is elastic, with an elasticity of demand above one. It would be prudent for Indonesian exporters to exercise greater caution in setting prices, given that a price increase will have a significantly greater impact on product demand than an equivalent increase in price. This elasticity value is consistent with that observed in other Indonesian export products, namely ground coffee and rubber, which have been found to have price elasticity values of more than one and to be demand-responsive to price changes (Fortunika et al., 2021; Nurzakiah et al., 2024).

In contrast, the price elasticity values for curcuma products from India, the Netherlands, Spain, and the USA are below one. This demonstrates that the country's curcuma is inelastic. Consequently, the four countries in question, namely India, the Netherlands, Spain, and the USA, are able to adjust prices with greater flexibility, as the reduction in demand resulting from price increases is less pronounced than the percentage increase in product prices.

The value of own price elasticity or demand elasticity of Indonesian curcuma is the highest when compared to other countries, with a value of -1.607 (Table 4). A 10% increase in price (ceteris paribus) will result in a 16.07% reduction in demand. The lowest value of the curcuma export demand elasticity was observed in Spain, with a coefficient of -0.359. A 10% increase in the price of Spanish curcuma (ceteris paribus) would result in a 3.59% reduction in demand. This figure indicates that the demand for Spanish curcuma exports is relatively inelastic with respect to price changes. Exporters of Spanish curcuma are free to raise their export prices. This is

due to the fact that increases in export prices are not particularly responsive to changes in export demand.

The policy implications of this elasticity analysis are as follows: in order to maintain its export market, Indonesia must maintain the export price of its curcuma.In order to enhance the value of Indonesian curcuma, it is necessary to implement standardisation and diversify products with a higher added value. Standardisation and diversification will also differentiate Indonesian curcuma products from those produced in other countries, thereby supporting competition with Indian curcuma.

CONCLUSION

Indonesian herbal products such as curcuma or temulawak are normal goods in the international market, as are other curcuma exporters. The Indonesian turmeric market is characterised by a direct competition with India, which is the world's leading exporter of turmeric. Meanwhile, the trade of turmeric between Indonesia and the Netherlands, Spain, Germany, and the USA is of a complementary in the international market. The demand for Indonesian turmeric exhibits an elastic characteristic, a phenomenon that is analogous to the behaviour observed in the demand for German turmeric. The demand for Indian, Spanish, USA, and Netherlands curcuma is relatively inelastic.

Exporters of Indonesian curcuma should be cognisant of the movement of Indian curcuma prices, which exhibit a substitution relationship or compete directly with Indonesian curcuma. Furthermore, curcuma exporters should exercise caution when increasing prices, given the elasticity properties of Indonesian curcuma, which have the capacity to reduce demand if prices are raised significantly. The enhancement of Indonesian curcuma quality through various means, such as the implementation of standardisation, is imperative. The implementation of standardisation must be initiated at the planting stage, encompassing 'good agriculture practices', and extended to 'good handling practices' in the post-harvest process, along with other standardisation initiatives that enhance the quality of Indonesian curcuma and impact the value of Indonesian curcuma exports. The processing of curcuma products with diverse processed goods will augment the added value of curcuma, consequently elevating the export price. Standardisation is a pivotal factor in enhancing the competitiveness of Indonesian curcuma, thereby mitigating its high demand elasticity when compared to other exporters.

AUTHOR CONTRIBUTION STATEMENT

[Author]: Research design, data collection, the initial manuscript draft, research conceptualisation, data analysis, and addressing reviewers' comments.

DECLARATION OF COMPETING INTEREST

The authors have no competing financial interests or personal relationships that could have influenced the results of the research reported in this research.

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ETHIC STATEMENT

The ethical review and approval process was waived for this study, as it did not involve any intervention and posed minimal risk to the participants. The present study employs a country-specific approach, leveraging readily available and accessible secondary data to mitigate risk.

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