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TRADE COMPETITIVENESS OF INDONESIAN COCOA BEAN EXPORTS TO MAIN EXPORT DESTINATION COUNTRIES

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Abstract

The development of Indonesian cocoa bean exports before implementation of cocoa bean export duty policy showed that Indonesia was known as the third largest cocoa exporter in the world. However, on the one hand, the export volume of cocoa beans causes its domestic availability to fluctuate. This research aims to analyze the competitiveness of Indonesian cocoa beans, and analyze the factors that influence Indonesian cocoa bean exports in five main destination countries. The methods used in this research are Herfindahl Index (HI), Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD), Trade Specialization (ISP) and Panel Data Regression. HI test results show an oligopoly market structure. RCA results are competitive (RCA > 1). EPD test results showed that Indonesian cocoa beans were in the Retreat position in USA, Singapore, India and Belgium except for Malaysia which was in the Lost Opportunity. The ISP results for Indonesian cocoa beans in Singapore, India and Belgium are at the maturity stage, while Malaysia and USA are at the growth stage. The research results show that export price of cocoa beans, the exchange rate, has a positive, while GDP per Capita has a negative and significant effect on the decline in the volume of Indonesian cocoa bean exports.

Keywords:***Cocoa Beans, Exports, Competitiveness, Panel Data Regression.***

1. INTRODUCTION

Cocoa is one of the commodities produced from the agricultural sector which is the mainstay of international trade for Indonesia and provides the third largest foreign exchange contribution after palm oil and rubber (Agriculture Department, 2007). Cocoa beans also play a role in encouraging regional development and agro-industry development. Since 2011, there has been a change in the composition of Indonesian cocoa exports, where exports of processed cocoa products have increased while cocoa beans have decreased (Suryana, Fariyanti and Rifin 2014). The low amount of domestic cocoa bean production is caused by cocoa trees that are old, have not been rejuvenated, and are not intensively maintained by farmers (Ministry of Agriculture, 2019).According to data from the Central Statistics Agency (BPS), in 2022 Indonesia will produce 650,612 tons of cocoa, down around 2.8% compared to the previous year.The decline in cocoa production occurs because the plants are generally old and need to be rejuvenated and caused by attacks by cocoa pod borer (PBK) and wood vein disease (VSD) which have not been completely resolved so that productivity is very low.(Ditjenbun, 2010). In 2018, the area of cocoa plantations reached 1.61 million hectares and decreased by 11.79 percent in 2022 to 1.42 million hectares (BPS, 2018).

Indonesia's cocoa production continues to declineThis is due to land conversion to other commodities which are considered to provide greater profitsespecially on Sulawesi Island, it is converted into palm oil, corn, rice and others. Land conversion occurred because the government in recent years has continued to increase production of rice, corn and soybeans as well as palm oil which is seen as more profitable by farmers. Based on 2010 Trademap data, Indonesia is ranked third in the world as an exporter of cocoa beans. Indonesian cocoa is included in commodities with comparative advantages, Indonesian cocoa also has advantages, including the high taste of Indonesian cocoa beans and Indonesian cocoa beans do not melt easily so they are suitable when used for blending or as a mixture. Efforts are made to increase the competitiveness of Indonesian cocoa bean exports so that they can compete with other cocoa bean exporting countries.The decline

in demand for Indonesian cocoa beans compared to processed cocoa is confirmed by regulation of Minister of Finance Regulation No. 67/PMK.011/2010, stipulates that starting in 2010 Indonesia will implement an export duty policy on cocoa beans with a progressive tariff of up to 15% adjusted to the price on the international market. This regulation aims to improve the domestic cocoa processing industry so that it can increase exports of competitive processed cocoa products. Competitiveness is an important factor for Indonesian cocoa in carrying out export activities so that it can survive in the international market. So it is necessary to maintain and increase the competitiveness of Indonesian cocoa beans and know what their competitive position is in the world market. Increasing competitiveness will increase demand for exported commodities. Commodity competitiveness in the international market can be determined through analysis of comparative advantage, competitive advantage, market share and position of Indonesian cocoa bean export trade in the international market. The higher the competitiveness of the commodity, the greater the export opportunities that can be carried out.

This difference in export volume was also accompanied by fluctuating developments in the export volume of cocoa beans. Even though it is one of the countries that imports the most cocoa from Indonesia, this does not guarantee that the volume of exports will always increase. Therefore, research is needed on the factors that influence the volume of Indonesian cocoa exports to the five main destination countries to find out the things that Indonesia must pay attention to so that its export volume can increase every year so that it can encourage Indonesia's competitiveness with other exporting countries. In this research, cocoa export prices, exchange rates (KURS), and GDP are thought to be the determining factors in the volume of Indonesian cocoa bean exports to the five main destination countries. Increasing the competitiveness of Indonesian cocoa beans needs to be supported by increasing the volume of cocoa bean exports, cocoa bean export prices, exchange rates (Exchange rates), and GDP per Capita. This is in accordance with research that analyzes the factors that influence and efforts to increase the competitiveness of East Java cocoa. . Factors that significantly influence the competitiveness of East Java processed cocoa are export volume, export price and cocoa productivity at the 10% level (Harya, 2018). Therefore, this research was conducted with the aim of looking for empirical evidence regarding competitiveness which can be seen from comparative advantage and competitive advantage, trade specialization and factors that influence Indonesian cocoa bean exports to main export destination countries.

2. IMPLEMENTATION METHOD

Data collection in this research was carried out using quantitative data presented in the form of data in the form of numbers. Then, they are combined into panel data and analyzed statistically. Determining the location in this research was carried out using a purposive method where the researcher deliberately determined the research location, namely Malaysia, the United States, Singapore, India and Belgium. The selection of these countries is based on data from the International Trade Center (2020) that these countries are the countries that dominate Indonesian cocoa bean exports during the 2017-2022 period and always export cocoa beans to Indonesia rather than other countries.

Panel data collection is sourced from secondary data from the variables of cocoa bean export prices, exchange rates (exchange rates) and GDP per Capita of importing countries obtained from the websiteUnited Nations Commodity Trade Statistics Database(UN Comtrade), Trade Map-International Trade Center (ITC), Food and Agriculture Organization (FAO),World Bankwhich was traced via the internet network, the Central Satitstik Agency (BPS) and the Department of Agriculture.The analytical methods used in this research are Herfindahl analysis (HI), Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD) analysis and Trade Specialization Index (ISP) using time series data used in this research starting from the 2003 period. -2022. The commodity analyzed is HS code 18010010 for cocoa beans. This research also uses a panel data regression analysis method using software tools in the form of Eviews 12 where the data analysis methods used are: Panel Regression Analysis, Panel Data Regression Model Estimation, Model

Specification Test, and Classic Assumption Test and Hypothesis Test. Panel data collection is sourced from secondary data from the variables of cocoa bean export prices, exchange rates and GDP per Capita of importing countries.

2.1 Herfindahl Index (HI) Analysis

Analysis of the Indonesian cocoa bean market structure in the five main export destinations analyzed using the Herfindahl Index(HI) or commonly called the Herfindahl Hirschman Index (HHI) is used to analyze the level of market concentration. From this analysis it will be possible to know the market structure faced by Indonesian cocoa beans which in turn can determine the level of competition faced. The calculation of the Herfindahl Index value is as follows (Hasibuan, 1993):

$$S_{ij} = \frac{X_{ij}}{TX_j}$$

Where:
Sij _=Country j's market share in cocoa bean commodity trading on the international market
Xij = Ncountry j's cocoa bean export value on the international market (US$).
TXj = Total export value of cocoa beans from all countries to each country's market main destination in international markets (US$)

The next step is to find out the market structure faced by an industry based on the HI value. The Herfindahl Index value depicts a country controlling the international market share, where the index is the sum of all the squares of each country's market share in the international market. The Herfindahl Index (HI) formula is as follows (Hasibuan, 1993):

HI = Sij12 + Sij22 + Sij32 + Sij42 + ...+ Sijn2

Where:
HI = Herfindahl index value
Sij = Market share of country j's cocoa bean commodity in the international market
i = Cocoa bean commodity
jn = Number of cocoa bean exporting countries j involved in trade world cocoa bean commodity (nth cocoa bean exporting country)

The level of market concentration that can be formulated from HI is as shown in Table 1 below (Hasibuan, 1993 in Panorama, 2016):

Table 1. Herfindahl Index Value for an Industry

Characteristic features	Monopoly	Oligopoly	Monopolistic	Perfect Competition
HI	(HI = 10,000)	(2,500<HI<10,000)	(100<HI<1,000)	(HI<100)
Number of Producers	One	A little	A number of	A huge amount
Barriers to market entry	Very high	Tall	Relatively low	There isn't any
Power determines price	Very large	Relatively	A little	There isn't any
Profit	Excessive	A bit more	Normal	Normal
Efficiency	Not good	Not good	Pretty good	Good
Market information	Very limited	Limited	Quite open	Open

Sumder: Hasibuan (1993) in Panorama (2016)

2.2 Revealed Comparative Advantage (RCA) Analysis

This analysis is used to measure the comparative advantage (competitiveness) of Indonesian export cocoa bean commodities in the five main export destination countries (Krisnamurthi, 2012). According to Pramesti (2017), the RCA method is based on the concept that trade between regions

shows the comparative advantages possessed by a region. Calculations using the RCA method of Indonesian cocoa bean exports in the five main export destination countries are carried out using the following formula (Basri and Munandar, 2010):

$$RCA = \frac{X_{ij} / X_j}{W_{ij} / W_j}$$

Where :

RCA = Level of competitiveness of cocoa bean commodities from Indonesia
Xij = Value of exports of cocoa beans from Indonesia to each of the five countries importer of Indonesian cocoa beans (US$).
Xj = Total export value of all Indonesian commodities to each seed importer Indonesian cocoa (US$).
Wij = World export value of cocoa bean commodities to each cocoa bean importer Indonesia (US$).
Wj = Total value of exports of all world commodities to each cocoa bean importer Indonesia (US$).

RCA's assessment is as follows:

a. If the RCA value is > 1, it means that the market share of cocoa bean exports in total Indonesian exports is greater than the average share of cocoa beans in exports in the world or that Indonesian cocoa beans have strong competitiveness (have a comparative advantage).
b. If the RCA value is <1, it means that the market share of cocoa bean exports in Indonesia's total exports is smaller than the average share of cocoa bean products in world exports or has low competitiveness (no competitiveness) (Meidiana, 2014).

2.3 Export Product Dynamic (EPD) Analysis

used to identify the competitiveness/competitive advantage of Indonesian cocoa exports with the five main export destination countries and find out whether cocoa is a commodity with dynamic performance or not (Ningsih, 2013). Systematically, the EDP method can be formulated as follows (Dhamira and Prasada 2021; Meliany and Novianti 2022):

X-axis: Growth in export market share or so-called business strength

$$\frac{\sum_{t=1}^{t} (\frac{Xij}{Wij})_t \; x \; 100\% - \sum_{t=1}^{t} (\frac{Xij}{Wij})_{t-1} \; x \; 100\%)}{Q}$$

Y-axis: Product market share growth

$$\frac{\sum_{t=1}^{t} (\frac{Xj}{Wj})_t \; x \; 100\% - \sum_{t=1}^{t} (\frac{Xj}{Wj})_{t-1} \; x \; 100\%)}{Q}$$

Where:

Xij = Value of Indonesian cocoa bean exports to main export destination countries (US$)
Wij = World export value of cocoa beans to each importing country Indonesian cocoa beans (US$)
Xj = Total value of exports of all Indonesian commodities to main destination countries exports (US$)
Wj = The total value of exports of all world commodities to the main export destination countries Indonesian cocoa beans (US$).
Q = Number of years analyzed
t-1 = Previous year
i = Cocoa bean commodity

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j = Indonesia or the whole world

Based on research by Estherhuizen (2006), the position matrix is categorized into four categories, namely rising star, falling star, lost opportunity and retreat as seen in Figure 1.

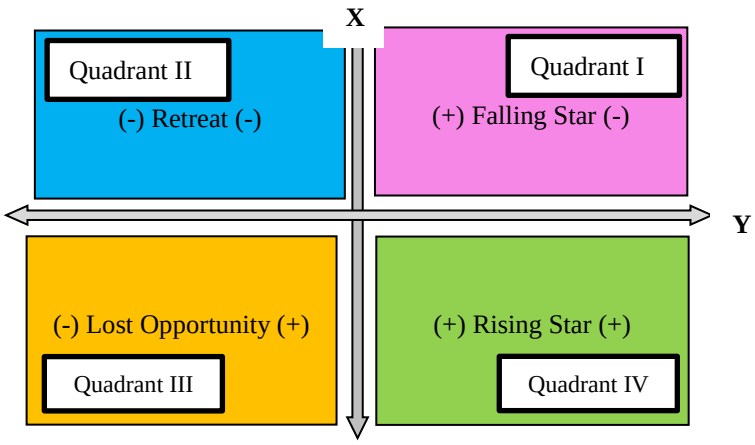

Figure 1. Export Product Dynamic (EPD)
Source: Estherhuizen, 2006

Based on Figure 1 it can be concluded:

1. Quadrant I, shows the rising star position, meaning that a product has dynamic and competitive market share growth for products that are developing or increasing rapidly. This position is an ideal position.
2. Quadrant II shows the position of lost opportunity, meaning that a product experiences a loss of market share that was previously competitive, despite dynamic export share growth.
3. Quadrant III shows a retreat position, meaning that the market share of a product is not competitive and export growth is stagnant. This condition is not desired by the market, but can be expected if the movement moves away from stagnant products and moves closer to increasing dynamic products (Krisnamurthi, 2012).
4. Quadrant IV shows a falling star position, meaning that a product from an exporting country has a competitive market share, but is followed by stagnant export growth.

2.4 Trading Specialization Index (ISP) Analysis

Used to find out whether an Indonesian cocoa bean commodity tends to become an exporting country or an importing country. Competitive competitiveness analysis using the ISP method is carried out by showing a comparison between the difference between the net value of trade and the total value of trade and is used to analyze the stages of industrialization and trade of a commodity (Tambunan, 2013). Mathematically, the ISP index can be calculated using the following formula (Hasibuan et al., 2012):

$$ISP = \frac{Xia - Mia}{Xia + Mia}$$

Where,

ISPs = Indonesian trade specialization index to country j in year t
Xia = Export value of Indonesian cocoa bean commodities to each of the five countries main export destination (US$)
Mia = Import value of Indonesian cocoa bean commodities from each of the five countries main export destination (US$)

1. Introduction Stage, namely if the ISP value is between -1 to -0.50. At this stage, an industry in one country (forerunner) starts to export a new commodity, then an industry in another country (latercomer) buys it, then the latercomer ISP value is at the introduction stage.
2. Import substitution stage, namely if the ISP value is between -0.50 to 0.00. At this stage, the competitiveness of latercomers is still low because production is not sufficient for domestic

demand. Latercomer countries have started producing these commodities, but the level of production has not yet reached its economic scale so that countries import more than they export.

3. Growth stage, namely if the ISP value is between 0.01 to 0.80. At this stage, latercomer countries have increased their production, until the supply of these commodities is higher than domestic market demand. The export value of latercomer countries experienced growth in this phase.
4. Maturity stage, namely when the ISP value is between 0.81 to 1.00. In this phase, latercomers can be said to be net exporters. The production technology applied as a whole is well standardized.
5. The import return stage, namely the ISP value again decreases from 1.00 to 0.00. At this stage, latercomer again becomes an importer of these commodities, because the latercomer industry is unable to compete in the domestic market with foreign industry.

2.4 Regression Model Estimation Test

The panel data regression analysis equation model in this research is formulated as follows:

lnVOLEKSit = □□ + □1(lnHRGit) + □2(lnKURSit) + □3(lnPDBit) + … + ei

Where,lnVOLEKSit = Natural logarithm of Indonesian cocoa bean export volume to five countries
main export destination 2003-2022 (Tons)
lnHRGit = Natural logarithm of Indonesian cocoa bean export prices to five countries
main export destinations 2003-2022 (USD/Ton)
lnCHURSit = Natural logarithm of the exchange rate of the five main export destination countries in the year
2003-2023 (USD)
lnPDBit = Natural logarithm of GDP per capita of five main export destination countries
2003-2022 (USD)
$\beta 0$ = Constant
$\beta 1 \beta 2 \beta 3$ = Regression coefficient on each independent variable
t = Time period (2003-2022)
i = Country
eh =*Term error*

Regression Model Fit Test

In the regression model, estimation models using panel data can be done using three approaches, namely FEM, CEM, and REM. According to Agus Widarjono (2007:258), there are three types of special tests used to select the best panel data regression model for an existing problem, namely as follows:

a) Test Chow

The Chow test is a statistical test on panel data which aims to select the best model between the Fixed Effect Model (FEM) or the Common Effect Model (CEM). The Chow Test hypothesis testing procedure is as follows (Baltagi, 2005):

H0: The appropriate model for panel data regression is the Common Effect Model

H1: The appropriate model for panel data regression is the Fixed Effect Model

If the chi-square cross section probability value is greater than □ = 5% (0.05) then H0 is accepted, which means the Common Effect Model is used. However, if the chi-square cross section probability value is smaller than □ = 5% (0.05) then H1 is accepted, which means the Fixed Effect Model is the best model to use and is continued with the Hausman Test.

b) Hausman test

The Hausman test is a test on panel data which aims to select the best model between the Fixed Effect Model or Random Effect Model. The hypothesis testing procedure for this test is as follows (Baltagi, 2008):

H0: The appropriate model for panel data regression is the Random Effect Model.

H1: The appropriate model for panel data regression is the Fixed Effect Model.

If the random cross-section probability value is greater than □ = 5% (0.05) then H0 is accepted, which means the Random Effect Model is used. However, if the random cross-section probability value is smaller than □ = 5% (0.05) then H1 is accepted, which means the Fixed Effect Model is the best model to use. In this research, it is best to use the Fixed Effect Model so that it does not test the Lagrange multiplier test.

c) Langrange Multiplier Test

According to Widarjono (2007), the Lagrange multiplier test is used to determine the best panel data regression model between the model obtained based on the Random Effect Model approach and the model obtained using the Common Effect Model approach. The hypotheses from this test are:

H0: The appropriate model for panel data regression is the Common Effect Model

H1: The appropriate model for panel data regression is the Random Effect Model

The statistical value contained in the Lagrange Multiplier test can be seen from the value of the Breusch-Pagan probability which is smaller than □ = 5% (0.05), which means that if you accept H1, it is better to use the Random Effect Model. However, if the Breusch-Pagan probability value is greater than □ = □ = 5% (0.05), which means accepting H0, then the best model that can be used in this research is to use the Common Effect Model as a regression analysis model.

2.5 Classic Assumption Test

The classical assumption test is a statistical requirement that must be met in analyzing panel data regression based on ordinary least squares (OLS). To ensure that the regression equation obtained is the best model, in terms of estimation accuracy, unbiased, consistent, precise and valid, it is necessary to test classical assumption analysis (Azuar Juliandi rt al., 2014). The classical assumption tests carried out include: normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test.

a) Normality test

The normality test is used to determine whether in the regression model, confounding or residual variables have a normal distribution. A regression model with a normal or close to normal distribution is called a good regression model. In this research, the probability level used is α = 0.05. The basis for decision making from probability numbers from JB statistics can be seen in the following terms:

a. If the probability value is 0.05 then the normality assumption is met
b. If the probability value is <0.05 then the normality assumption is not met.

b) Multicollinearity Test

The multicollinearity test is a linear relationship that occurs in independent variables. One way to detect whether there is multicollinearity is to use a correlation matrix. If the correlation coefficient value for each independent variable exceeds 0.8, this indicates that multicorrelation is occurring. On the other hand, if the correlation coefficient value is less than 0.8 then the independent variables used in the research are free from multicollinearity problems.

c) Autocorrelation Test

Autocorrelation testing is intended to determine whether there is a correlation between members of a series of observations ordered by time (time series) or by space (cross sectional). The basis for decision making in the Durbin-Watson test is carried out by adopting the argument of Singgih (2000), as follows:

a). If the Durbin-Watson number is below –2, it means there is positive autocorrelation.
b). If the Durbin-Watson number is between –2 to +2, it means there is no autocorrelation.
c). If the Durbin-Watson number is above +2, it means there is negative autocorrelation.

d) Heteroscedasticity Test

The heteroscedasticity test is a test carried out with the aim of finding residual discrepancies from one observation to another. Heteroscedasticity means that there is a residual variance that is not homogeneous or not the same in the regression model (Ghozali, 2016). The requirements that must be met in the regression model are the absence of heteroscedasticity symptoms. In the research, the heteroscedasticity test was carried out using the glacier test approach.

3. RESULTS AND DISCUSSION

3.1Analysis of the Indonesian Cocoa Bean Market Structure in Five Main Destination Countries

Herfindahl Index(HI) in this research is a type of concentration measure that is often used to determine the market structure of cocoa beans in the markets of the main export destination countries and measure the market share of each country involved in trading cocoa beans. The HI value ranges from 0 to 10,000 where, the HI value obtained is close to the minimum limit, then the market structure of the cocoa bean industry in question tends to be a competitive market, while if the index value is close to the maximum limit then the market structure of the cocoa bean industry tends to be monopolistic and the distribution of market share is very uneven in the cocoa bean industry. The results of market share analysis using the Herfindahl Index (HI) method for cocoa beans for 2003-2022 in the five main destination countries can be seen in Table 2.

Table 2. Herfindahl Index (HI) Values for Indonesian Cocoa Beans in Five Main Destination Countries, 2003-2022

Year	Malaysia	USA	Singapore	India	Belgium
2003	7,576.74	9,794.38	3,454.18	3,295.42	5,932.54
2004	5,556.35	9,538.87	4,535.64	3,295.42	6,233.68
2005	5,141.46	9,328.24	5,517.57	3,052.65	2,617.09
2006	4,528.06	9,723.50	5,687.35	9,134.39	9,504.92
2007	4,316.35	9,302.60	5,152.09	7,221.13	5,204.50
2008	8,579.53	8,947.19	4,697.26	6,901.00	9,635.17
2009	3,729.13	9,948.62	5,751.96	8,469.23	7,234.32
2010	4,305.73	8,633.03	5,806.21	6,988.65	5,360.94
2011	6,920.83	9,783.92	9,613.21	9,818.30	8,795.27
2012	7,253.50	9,832.18	2,891.70	9,204.55	8,748.83
2013	9,006.47	9,874.64	6,340.93	9,193.54	9,814.94
2014	4,931.58	5,862.67	8,854.58	5,436.90	4,888.61
2015	1,645.56	5,454.87	9,823.31	5,076.80	5,912.42
2016	8,542.36	9,794.22	8,612.46	4,329.27	8,546.97
2017	3,796.14	6,703.28	9,706.11	4,417.06	5,071.86
2018	5,000.60	6,329.39	9,856.04	5,043.66	4,450.52
2019	4,819.14	4,466.46	9,695.33	4,499.34	4,934.81
2020	4,790.04	3,872.94	9,433.44	7,913.98	4,389.63
2021	3,909.78	6,056.21	9,558.55	5,379.25	6,358.92
2022	4,723.93	5,631.13	9,855.35	6,871.15	4,525.22

Average	**5,453.66**	**7,943.92**	**7,242.16**	**6,277.08**	**6,096.27**
Market Structure	**Oligopoly**	**Oligopoly**	**Oligopoly**	**Oligopoly**	**Oligopoly**

Based on Table 2, the values can be seen*Herfindahl Index*cocoa beans(cocoa beans)in the five main export destination countries as a whole, the average HI value of cocoa beans(cocoa beans)Indonesia in the five main export destination countries has the highest value in the United States (USA) market with an average value of 7,592.58 and the lowest value in the Malaysian market with an average value of HI of 5,453.66. Cocoa bean market structure(cocoa beans)in the five main export destination countries, all of them are oligopoly markets because the HI value of each country is in the oligopoly category, namely between2,500<HI<10,000 (Hasibuan, 1993).

The prices in this oligopoly market are not far away or could be said to be almost the same. The meaning of the same price is that the price of cocoa beans sold by one exporter to another is not much different.Barriers to entry into oligopoly markets are also high, making it difficult to enter the market so that new exporters will find it difficult to compete. The United States Food and Drug Administration (FDA) (2019) has issued cocoa quality standards that are suitable for trading on the international market, namely: 1) Cocoa beans must be fermented, dry (7% moisture content), free from smoky beans, free from odor abnormal and foreign odor and free from evidence of adulteration, 2) Cocoa beans must be free from attack by life and, 3) Cocoa beans in one batch (packaging) must have a uniform size, free from broken beans, seed fragments and shell fragments , and free from foreign objects.

This oligopoly structure shows that the Malaysian market, a country that exports cocoa beans in the world, is dependent on each other. If there is a price change made by one exporter, it will affect the sales of other exporters. The prices in this oligopoly market are not far away or could be said to be almost the same. The meaning of the same price is that the price of cocoa beans sold by one producer to another is not much different.Barriers to entry into oligopoly markets are also high, making it difficult to enter the market so that new exporters will find it difficult to compete. According to the International Trade Administration (2020), import procedures into Malaysia are: 1) All goods to be imported, whether due to import duties or not, must be declared in writing on Customs Form No. 1, 2) All statements must show a complete and correct account of the number and description of goods and packaging, value, weight, size, or quantity, and the country of origin or final destination, 3) The declaration must be submitted to the Customs office at the place where the goods will be imported , 4) All customs duties/taxes that will be imposed on imported goods must be paid first before the goods can be released (import tax and goods and services tax) and, 5) Documents required by Malaysian Customs include: Custom Form No.1, bill of lading/airway bill; commercial invoice or proforma invoice; relevant packing lists, permits, licenses or certificates.

Singapore market structure value*Herfindahl Index*experiencetends to increase. HI values range between3,454.18-9,855.35 with an average of 7,242.16 and is included in an oligopoly country. The highest HI value was in 2018, amounting to 9,856.04 and the lowest in 2012, amounting to 2,4891.70. A large HI value indicates the level of competition for cocoa beans(cocoa beans)Singapore in 2012 was low or too strict. The low competition this year is due to the small number of exporters, only twenty countries, whereas in 2018 the number of exporters was seventeen countries. Cocoa bean exporting countries(cocoa beans)to Singapore, including Malaysia, Ghana, Nigeria, Thailand and the Netherlands. According to the ASEAN National Secretariat (2017), Singapore's import barriers consist of several, namely: 1) Involving a Singapore trading company for trade purposes. More detailed information regarding this matter can be obtained from the Singapore Company Incorporation Guide, 2) Registering with Singapore customs and excise and obtaining import registration number, 3) Submit an application for the required import license or permit and, 4) Pay taxes and services (GST) on imported goods (if required).

Indian values*Herfindahl Index*experiencing fluctuations tends to increase as well with an average of 6,277.08 which includes an oligopoly market structure. In the oligopoly market, it is explained that price changes made by one exporter will affect the sales of other exporters. The oligopoly structure in India can be seen in the HI value of cocoa beans in India. The highest HI value was in 2011, amounting to 9,818.30 and the lowest was 3,052.65 in 2005. The level of competition in 2003 and 2011 was low, this was because the number of exporters in that year was only six countries with a greater export value in 2011, namely US$ 4,218,209,896 with total exports from 10 countries compared to 2003. An oligopoly market is a market condition where cocoa beans are controlled by only a few exporters, making price competition in the market unbalanced. Oligopoly markets have high market entry barriers, according to ITPC (2013), trade barriers in the Indian market are complex tariff structures, customs duties and cost systems and are characterized by a lack of openness in determining the effective level of customs tariffs, excise duties and costs. -other costs. The applied tariff structure consists of: (1)*Additional duties*, imposed on all imported products except wine, spirits or other alcoholic beverages,(2)*Special additional duty*namely 4% ad valorem duty, imposed on all imports, including alcoholic beverages, except those exempt from tariff obligations in accordance with customs regulations, (3) Education cess (additional fee) of 3% applies to the total basic custom duty and additional duty on most imports, except those exempt from tariff obligations in accordance with customs regulations, and (4) Basic custom duty for HS 18 products (cocoa and cocoa preparations) of 30% with rates between 4-16% for additional duty and 3 % for education cess.

The structure of the cocoa bean market in Belgium is included in the oligopoly market. Oligopoly markets can be identified from value*Herfindahl Index.*The average HI value in Belgium is 6,096.27 with the lowest HI value being 2,617.09 in 2005 and the highest being 9,814.94 in 2013. The number of exporters in 2005 was less than the number of exporters in 2011, namely twenty-five countries, while in 2011 there were three. twenty-six countries. Twenty-five Belgian cocoa beans exporters, the main exporters being Ivory Coast, Ghana and Cameroon. Oligopoly markets have high barriers to market entry, according to Inatrims Ministry of Trade (2024), trade barriers for Belgian market access, export products must comply with the mandatory requirements set by Belgium, including (1) Compulsory, namely the requirements that must be complied with in order to enter the market, (2)) Voluntary standards or general standards, namely standards that must be complied with in order to compete in the market and, (3) Market niche standards, namely standards set in specific market segments. The requirements that must be complied with to market cocoa (chocolate) in Belgium include (1) Food safety that applies to all products, (2) Chemical and physical contamination of food products, (3) Health controls for all products, (4) Compounds extraction for cocoa butter and, (5) Special regulations for chocolate products. The results of this research are in accordance with research by Arum (2021) which states that from the results of the Herfindahl Index (HI) of Indonesian processed cocoa exports, an oligopoly market structure was obtained in all destination countries.

3.2 Comparative Competitive Analysis (RCA)

Revealed Comparative Advantage(RCA) is a method for analyzing the competitiveness of comparative advantages of cocoa bean commodities(cocoa beans)Indonesia in the five main export destination countries.The RCA value of Indonesian cocoa beans to the five main destination countries for 2003-2022 can be seen in Table 3.

Table 3. Revealed Comparative Advantage (RCA) Analysis of Indonesian Cocoa Beans in Five Main Export Destination Countries (US$), 2003-2022

Year	Malaysia	USA	Singapore	India	Belgium
2003	870.05	16.28	554.53	28.58	65.15
2004	364.82	25.97	664.51	582.06	18.37
2005	345.27	60.62	528.21	3.21	29.46

2006	399.43	29.11	528.56	83.12	21.60
2007	233.42	23.86	273.62	211.19	89.45
2008	5.14	4.27	403.95	499.85	-
2009	805.74	8.40	15.77	75.58	5.96
2010	6.41	4.81	3.34	254.85	0.69
2011	8.89	0.56	5.70	7.85	-
2012	11.44	0.02	655.30	39.37	0.15
2013	10.54	0.38	215.77	133.16	0.08
2014	1,523.92	0.03	12.90	3.73	0.13
2015	813.43	0.31	2.39	-	0.12
2016	3.29	0.08	13.07	0.79	-
2017	0.19	0.06	0.00	3.64	0.25
2018	9.28	0.00	0.02	0.16	0.23
2019	1.46	0.01	0.00	0.56	0.36
2020	6.99	0.26	0.18	0.03	5.31
2021	0.59	0.01	0.00	-	0.03
2022	0.81	0.10	0.00	0.01	-
Average	**271.05**	**8.76**	**193.89**	**96.39**	**11.87**

Source: UN Comtrade, (data processed)

Based on Table 3, the index value*Revealed Comparative Advantage*cocoa beans(cocoa beans)Indonesia's five main destination countries, namely Malaysia, USA, Singapore, India and Belgium, have tended to decline over the last twenty years. Overall, Indonesian cocoa bean exports to Malaysia, USA, Singapore, India and Belgium tend to have good opportunities to increase the quality and quantity of exports in these five countries due to the positive RCA value trend. The highest average RCA value for Indonesian cocoa beans is in Malaysia at 271.05 and the lowest is in the USA at 8.76. The USA has the lowest comparative advantage value compared to the other four destination countries. This is because the USA does not have a large area of cocoa bean plantations that can be seen according to the Food and Agriculture Organization (2022), so that the USA obtains cocoa beans only relying on imports from other countries, compared to Indonesia which has a planting area of 1.4 million hectares. However, Indonesia still has comparative competitiveness because it has an average RCA value of more than one.

According to*Food and Agriculture Organization*(2022),When compared with Indonesia's plantation area, it is 1.4 million hectares, while Malaysia's is only 0.41% or 5,985 hectares. However, superior agricultural products produced by Malaysia include rice, palm oil, coconut, rubber, black pepper, and others. Judging from the agricultural products produced by Malaysia, it shows that Indonesia and Malaysia have different natural resources. Therefore, each country specializes in producing a commodity, causing Indonesian cocoa beans to have a comparative advantage or high competitiveness in Malaysia. In the third main destination country or the second largest RCA value, namely Singapore with an average RCA value of 193.89, indicating that the competitiveness of Indonesian cocoa beans in Singapore is higher than the USA, India and Belgium. According to International Trade (2022), the decline in RCA value was caused by a decline in the value of Indonesian cocoa bean exports to Singapore from 2017-2022 by 0.3% (US$ 505 thousand) on average every year. Overall, the average RCA in the five main destination countries has a value of more than one, which shows that Indonesian cocoa beans in these countries have a comparative advantage or are competitive.

The average RCA value in India and Belgium reached 96.39 and 11.87, which shows that the competitiveness of Indonesian cocoa beans for India and Belgium is higher than for the USA. According to UN Comtrade (2022), the decline in RCA was caused by a decrease in the value of Indonesia's cocoa bean exports to India and Belgium. Indonesia did not export to India and Belgium for several years, namely in India in 2015 and 2021 while in Belgium it was 2008, 2011, 2016 and 2022 Apart from that, there has been a decline in the export value of cocoa beans(cocoa beans)to India and Belgium is also low. Overall, the average RCA value in India and Belgium is more than one, indicating that Indonesian cocoa beans have a comparative advantage or are able to compete.

Based on the calculation of comparative advantage using the RCA method, the results show that Indonesian cocoa beans have strong (comparative) competitiveness in the international market, meaning Indonesian cocoa beans in the international markethas a value of more than one, which shows that Indonesian cocoa beans have a comparative advantage or are able to compete.The results of this research are in accordance with research by Vanzza (2017) which states that the RCA value shows Indonesia's competitiveness. Indonesia has a competitive advantage in the international market, this is because the value of the Indonesian RCA index from 2001 to 2016 is much greater than 1 and also the average the average is 1.01

3.3Competitive Power Analysis (EPD)

Dynamic Product Export(EPD) is one of the methods used to provide a good overview of the level of competitiveness. If the growth of the commodity is above average and this situation continues for a long period of time, then it is likely that the commodity will eventually become an important source of export income for a country. Below in Table 4 the results of the analysis are shownEPD of Indonesian cocoa beans to the five main export destination countries in 2003-2022.

Table 4. Export Product Dynamic (EPD) Results of Indonesian Cocoa Beans in Five Main Destination Countries, 2003-2022

Country	X axis	Y axis	Market Position
Malaysia	-0.022792006	0.000356732	*Lost Opportunity*
USA	-4.67794E-05	-2.4273E-06	*Retreat*
Singapore	-0.01380784	-2.28442E-05	*Retreat*
India	-0.000230606	-0.522774E-06	*Retreat*
Belgium	-5.31505E-05	-6.70781E-07	*Retreat*

Source: UN Comtrade, (data processed)

Table 4 shows that the position value*Dynamic Product Export*(EPD) of Indonesian cocoa beans to the Malaysian market is negative in position X and Y is positive so it is in the Lost Opportunity position. The EPD value of Indonesian cocoa beans for the USA, Singapore, India and Belgium markets in both positions X and Y are both negative so they are in the Retreat position. The competitive position of Indonesian cocoa bean EPD in the markets of the five main export destination countries in 2003-2022 can be seen in Figure 2.

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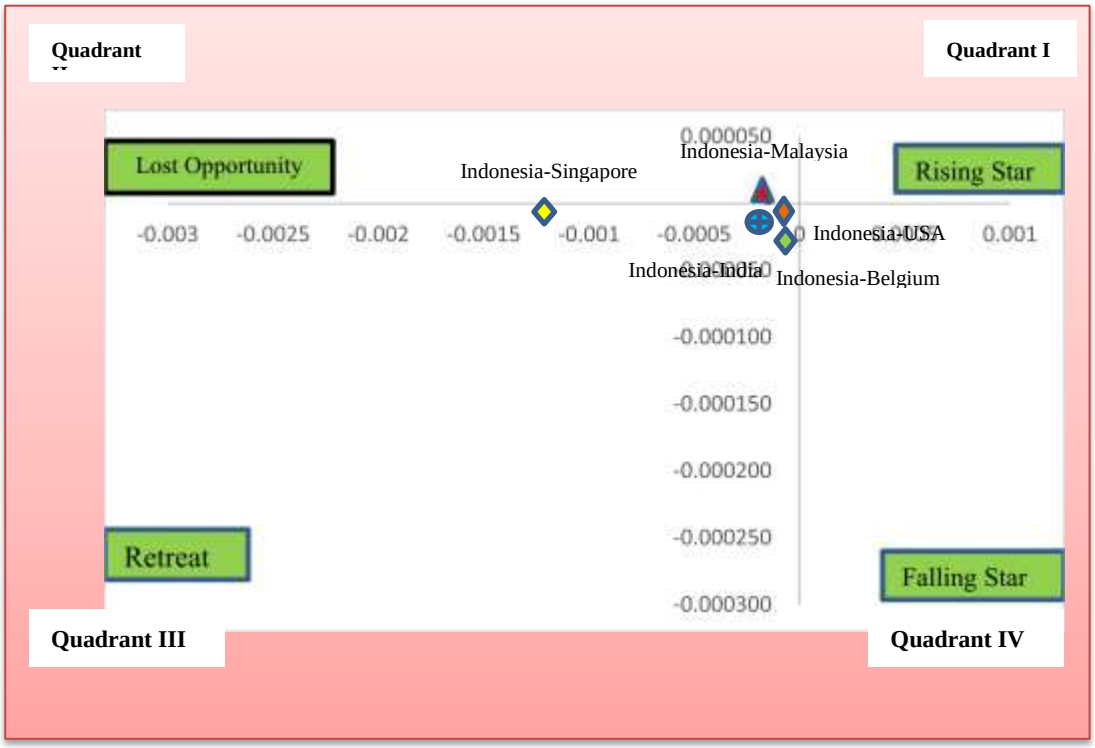

Source: UN Comtrade, (processed data)

Figure 2. Competitive position of Indonesian cocoa beans in the five main export destination countries

Figure 2 shows the competitiveness (competitive advantage) of Indonesian cocoa beans to the Malaysian market is in quadrant II or lost opportunity where, the growth in export market share is negative but the growth in product share is positive, Indonesia loses the opportunity to reach the market share of cocoa beans or market share growth has decreased so that it is lower in the Malaysian market (does not have a competitive advantage) but the product has a product market share growth that is growing faster than the average of all products (dynamic). This position is the most undesirable position, apart from that this product also experienced a decline in export value from 2017 - 2018 which was shown in the negative growth of its export market share. The lost opportunity competitive position means that Indonesia must expand and increase its share of the export market for cocoa beans in the Malaysian market. This is in line with Indonesia's export position of cocoa beans which was replaced by Ivory Coast, where in the 2003-2007 period Indonesia was the main exporter of cocoa beans to Malaysia with an export value reaching US$ 296,882,018, while in At the same time, Ivory Coast only exported US$ 51,242,731. Since 2010, Ivory Coast has replaced Indonesia as the main exporter of cocoa beans to Malaysia, this is the

reason why Indonesia is in a lost opportunity position which has the impact of losing the opportunity for Indonesia to reach the Malaysian cocoa beans market. The competitive position (competitive advantage) of Indonesia's cocoa beans to the USA, Singapore, India and Belgium is in quadrant III or retreat, namely Indonesia has stagnant cocoa bean products in these four country markets. A stagnant product indicates a product's market share that is growing no faster than the average for all products. This is because the export value of cocoa beans and the total value of Indonesia's exports to the USA, Singapore, India and Belgium have decreased. The retreat position occurred because of the decline in the share of Indonesian cocoa bean exports to these countries. This indicates that Indonesian cocoa beans are unable to compete with other exporters so that Indonesian cocoa beans are no longer wanted in these four countries. This is also proven by the decline in the value of Indonesian cocoa beans (cocoa beans) exports to the USA, Singapore, India and Belgium. In 2010, the export value of Indonesian cocoa beans to the USA, Singapore and Belgium was worth US$ 246,501,286, US$ 151,483,931, US$ 2,403,023 respectively, and in 2014 to India it was US$ 23,191. 379. Meanwhile in 2011 the export value of cocoa beans to the USA fell to US$ 216,840,116, exports to Singapore fell by US$ 53,062,745, and exports to Belgium in 2011 did not export and resumed exports in 2012 with a decrease of US$ 2,078,197 and exports to India in 2015 Indonesia did not export and exports returned in 2016 with a decrease of US$ 21,173,025. Most of the exports of cocoa beans to these countries are supplied by Ivory Coast. The export position of Indonesian cocoa beans (cacao beans) in these four countries is that the market share of a product is not competitive and export growth is stagnant, so that Indonesia does not have the potential for competitiveness of cocoa beans and this product is also not in demand in these four countries (USA, Singapore, India and Belgium).

Based on the calculation of competitive advantage using the EPD method, the results show that Indonesian cocoa beans in the Malaysian market are at a lost opportunity where, the growth in export market share is negative but the growth in product share is positive, Indonesia has lost the opportunity to reach the market share of cocoa beans (cocoa beans).) in the Malaysian market (does not have a competitive advantage) but the product has a product market share growth that is growing faster than the average of all products (dynamic). Meanwhile, the competitive advantage obtained using the EPD method is that Indonesian cocoa beans in the USA, Singapore, India and Belgium markets are in a retreat position where cocoa beans (cocoa beans) products are stagnant in these four countries. A stagnant product indicates a product's market share that is growing no faster than the average for all products. This is because the export value of cocoa beans and the total value of Indonesia's exports to these four countries has decreased. The results of this research are in accordance with research by Augustin (2022) which states that Indonesia is in a retreat position, where this position means that market conditions are no longer desirable because the growth in the Indonesian cocoa bean export market share in this country is lower than the average growth in world export market share. where there is a decline in demand in the country.

3.4Analysis of the Trade Specialization Position (ISP) of Indonesian Cocoa Beans in Five Main Destination Countries

The position of cocoa bean trade specialization in the five export destination countries can illustrate whether Indonesian cocoa beans in the five main export destination countries have specialization as importing or exporting countries. The Trade Specialization Index (ISP) method is used to determine the position or stage of development of Indonesian cocoa beans so that Indonesia can see whether it is an exporter or importer country in the main destination countries, namely Malaysia, USA, Singapore, India and Belgium. The results of the analysis of Indonesia's cocoa bean trade position in the 2003-2022 period for the five main destination countries can be seen in Figure 3.

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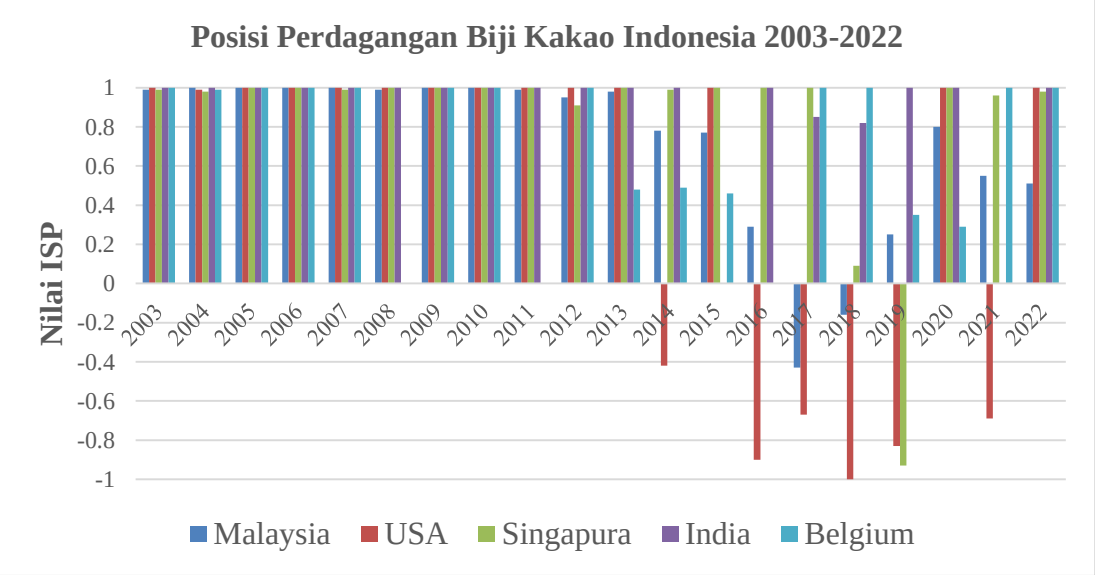


Information	Malaysia	USA	Singapore	India	Belgium
ISP Average Rating	0.71	0.47	0.85	0.98	0.88

Source: UN Comtrade, (data processed)

Figure 3. Position of Indonesian Cocoa Bean Trade Specialization

Figure 3 shows the Trade Specialization Index (ISP) value of Indonesian cocoa beans in the five main destination countries during the 2003-2022 period, where the highest average ISP value is in the Indian market at 0.88 and the average ISP value lowest in the USA market at 0.47. Trade in Indonesian cocoa beans (cocoa beans) to Malaysia in the 2003-2022 period has an ISP value that tends to stagnate so that it has reached the growth stage with an average ISP value of 0.71. This growth stage illustrates that the Indonesian cocoa bean commodity has strong competitiveness but is still in the stage of developing competitiveness in the Malaysian market. Apart from that, the occurrence of latercomers or the emergence of new entrants who increase their production means that the supply of these commodities is higher than domestic market demand.

The ISP value of Indonesian cocoa beans in Malaysia has experienced a very high decline in several years, resulting in a minus value in 2017-2018 caused by exports of Indonesian cocoa beans amounting to US$ 119,197,059, while imports of cocoa beans (cocoa beans) reached US$ 221,774,084. The ISP value increased to one from 2004-2007 and 2009-2010 due to the fluctuating value of exports of cocoa beans but tended to increase with the highest export value reaching US$ 550,917,224 in 2010 and the same year Indonesia did not importing cocoa beans from Malaysia (US$ 0). The results of this research are in accordance with research by Rahmadona (2023) with the title "Analysis of the Competitiveness of Indonesian Processed Cocoa in the World's Main Destination Countries" which states that from the ISP results the trade position of Indonesian processed cocoa in Malaysia is at the growth stage with an average ISP value 0.587, which means that trade in Indonesian processed cocoa in Malaysia is still in the development stage by expanding exports. The trading position of Indonesian cocoa beans in the USA is at a growth stage with an average ISP of 0.47. Of the five main destination countries for Indonesia, the ISP value in the USA is the lowest, but is still in the growth stage, indicating that trade in Indonesian cocoa beans in the USA market has expanded exports.

This growth stage also shows that Indonesian cocoa beans have strong competitiveness but are still at the stage of developing competitiveness in the US market. The ISP value of Indonesian cocoa beans to the USA in 2003-2010 experienced fluctuations tending to increase with the highest export value reaching US$ 297,012,888 in 2009, while the import value fluctuated tending to decrease with the highest import value in 2004 reaching US$ 433,429. The ISP value at one occurred in 2014, 2016 to 2019 and 2021, this is because the export value in that year was much

lower than the import value. The lowest ISP value occurred in 2016 with export value reaching US$ 1,345,375 while imports of cocoa beans reached US$ 26,194,749. The results of this research are in accordance with research by Rahmadona (2023) with the title "Analysis of the Competitiveness of Indonesian Processed Cocoa in the World's Main Destination Countries" which states that from the ISP results the trade position of Indonesian processed cocoa in Malaysia is at the growth stage with an average ISP value 0.587, which means that trade in Indonesian processed cocoa in Malaysia is still in the development stage by expanding exports.

Trade in Indonesian cocoa beans in the Singapore market is at a maturity stage with an average ISP value of 0.85. This maturity stage indicates that Indonesia as a whole has entered the stage of technological standardization well and has strong competitiveness. The average ISP value that reaches above 0.81-1.00 means that Indonesia specializes as an exporting country so that Indonesia can maintain its position as a net exporter country during the 2003-2022 period by continuing to export cocoa beans to Singapore. . The ISP value of cocoa beans (cocoa beans) in Singapore in 2003-2022 was stagnant at one value due to the fluctuating export value of cocoa beans (cocoa beans) tending to increase with the highest export value in 2009 amounting to US$ 139,238,795, while Indonesia itself only importing cocoa beans in 2020 amounted to 10 US$. Indonesia itself is the third largest exporter of cocoa beans (cocoa beans) in the United States. Therefore, the USA can be said to be a potential market for trade in Indonesian cocoa beans. The results of this research are in accordance with research by Ragimun (2013) which stated that from the ISP results, the average was 0.80 or close to 1, this means Indonesia's specialization as an exporter of cocoa commodities.

The trade position of Indonesian cocoa beans in the five main destination countries with the highest first ISP value occurred in India in the 2003-2022 period with an ISP value of 0.98, which tends to be stagnant and has reached the maturity stage. This maturity stage illustrates that the Indonesian cocoa bean commodity has entered the stage of standardization of the technology used and has strong competitiveness in the Indian market. In this condition, Indonesia has specialized as a net exporter of cocoa beans in the Indian market. The highest export value of Indonesian cocoa beans to India was in 2014 amounting to US$ 23,191,379 while the lowest was in 2005 amounting to US$ 10,450. Although not large, India also exports cocoa beans to Indonesia, where the value of India's exports of cocoa beans to Indonesia was highest in 2017 with the export value of cocoa beans amounting to US$ 173,643 while the lowest in 2018 with an export value of cocoa beans of US$ 90,397.

Indonesia has an ISP value of 0.1, this is because almost every year it does not import at all from Singapore (US$ 0), namely in 2003-2016 and 2019-2022 Indonesia did not import. Indonesia itself is the third largest exporter of cocoa beans in India. Therefore, India can be said to be a potential market for trade in Indonesian cocoa beans. The results of this research are in accordance with research by Ragimun (2013) which stated that from the ISP results, the average was 0.80 or close to 1, this means Indonesia's specialization as an exporter of cocoa commodities. The trading position of Indonesian cocoa beans in Belgium has also entered the maturity stage where the average ISP value reaches 0.88. This maturity stage indicates that Indonesia has strong competitiveness in the Belgian market. Indonesia also specializes as an exporting country. The ISP value of cocoa beans in Belgium in the 2003-2022 period fluctuated, tending to decrease. This is because the value of exports which fluctuates tends to increase accompanied by the value of imports which also fluctuates tends to increase but only imports for a few years so that Indonesia has a stagnant ISP value of 1.00.

The highest export value was in 2006 amounting to US$ 5,352,830, while the highest import value was US$ 593,591 in 2020, where the difference is so large that Indonesia itself is the ninth largest exporter of cocoa beans in the Belgian market, so Belgium can be said to be become a potential market for the trade of Indonesian cocoa beans. The results of this research are in accordance with research by Ragimun (2013) which stated that from the ISP results, the average was 0.80 or close to 1, this means Indonesia's specialization as an exporter of cocoa commodities. The five main

export destination countries for Indonesian cocoa beans are at the maturity stage, namely Singapore, India and Belgium, where this stage shows that Indonesian cocoa beans already have a position as a net exporter country in the five countries' markets. the. Meanwhile, Indonesian cocoa beans (cocoa beans) which are at the growth stage occur in Malaysia and the USA, which shows that Indonesian cocoa beans (cocoa beans) in these two countries have strong competitiveness but are still in the development stage of competitiveness.

3.5. Analysis of Factors Affecting Indonesia's Cocoa Bean Export Volume 2003-2022 to Five Main Export Destination Countries

Panel data regression test results to analyze the factors that influence the volume of Indonesian cocoa bean exports to the main export destination countries. The regression model estimation test was carried out using three methods, namely the common effect, fixed effect and random effect methods. Panel data estimation testing is needed to find the most appropriate method for estimating panel data regression models. Panel data estimation testing uses the Chow and Hausman tests in the regression model. The Chow test is a test used to determine the best panel data regression model between the common effect and fixed effect methods. The estimation results show that the chi-square cross section probability value is 0.0000, which means the chi-square cross section probability value is <0.005 so it can be decided to reject □0 and the best method to use for panel data regression is fixed effects. Then a Hausman test was carried out which was used to determine the best panel data regression model between the fixed effect and random effect methods. The estimation results show that the random cross section probability value is 0.0000, which means the random cross section probability value is <0.005 so it can be decided to reject □0 and the best method to use for panel data regression is fixed effects. Based on the results of tests carried out by the Chow and Hausman tests, it was found that the regression model using the fixed effect method was the best model used in estimating panel data regression. So in this research there is no need for a Langrange multiplier test to determine the best method for panel data regression. Table 5 below is the result of panel data regression using the fixed effect method.

Table 5. Estimation Results of Panel Data Regression Model (FEM)

Dependent Variable: LOGVOLEKS?
Method: Pooled Least Squares
Date: 06/29/24 Time: 12:49
Sample: 2003 2022
Included observations: 20
Cross-sections included: 5
Total pool (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	47.67863	11.37402	4.191889	0.0001
LOGHRG?	0.707390	0.114181	6.195341	0.0000
LOGKURS?	4.806604	2.309222	2.081482	0.0402
LOGPDB?	-5.192363	1.286179	-4.037045	0.0001
Fixed Effects (Cross)				
_BELGIUM--C	8.519108			
_INDIA--C	-28.64354			
_MALAYSIA--C	-0.827559			
_SINGAPURA--C	9.493348			
_USA--C	11.45865			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.616863	Mean dependent var	7.392799
Adjusted R-squared	0.587711	S.D. dependent var	3.683564
S.E. of regression	2.365206	Akaike info criterion	4.636226
Sum squared resid	514.6664	Schwarz criterion	4.844639
Log likelihood	-223.8113	Hannan-Quinn criter.	4.720575
F-statistic	21.16041	Durbin-Watson stat	0.621362
Prob(F-statistic)	0.000000		

Based on Table 5, the equation results that can be obtained using the Fixed Effect Model (FEM) in the eviews 12 application, the regression equation for Indonesia towards the five main destination countries, namely Belgium, India, Malaysia, Singapore and the USA, is obtained as follows:

1. Belgium

   VOLEX= 56.19774 + 0.707390 HRG + 4.806604 EXCHANGE - 5.192363 GDP
2. India

   VOLEX= 19.03509 + 0.707390 HRG + 4.806604 EXCHANGE - 5.192363 GDP
3. Malaysia

   VOLEX= 46.85107 + 0.707390 HRG + 4.806604 EXCHANGE - 5.192363 GDP
4. Singapore

   VOLEX= 57.17198 + 0.707390 HRG + 4.806604 EXCHANGE - 5.192363 GDP
5. USA

   VOLEX= 59.13728 + 0.707390 HRG + 4.806604 EXCHANGE - 5.192363 GDP

The explanation of the regression equation using the Fixed Effect Model (FEM) Panel Least Squares can be interpreted as follows:

a. If the independent variables export price of cocoa beans (HRG), exchange rate (KURS), and GDP per Capita (GDP) are assumed to be constant, then the volume of Indonesian exports of cocoa beans (cocoa beans) to the destination country Belgium (VOLEKS) will increase with a coefficient value of 56.19774 or a constant value for Belgium of 56.19774, meaning that without the price (X1), exchange rate (X2), and GDP per Capita (X3) variables, the Belgian export volume variable (Y) would increase by 56 ,19774 tons. India's constant value is 19.03509, meaning that without the price (X1), exchange rate (X2) and GDP per Capita (X3) variables, India's export volume variable (Y) would increase by 19.03509 tons. The constant value for Malaysia is 46.85107, meaning that without the price (X1), exchange rate (X2) and GDP per Capita (X3) variables, the Malaysian export volume variable (Y) would increase by 46.85107 tons. The constant value for Singapore is 59.13728, meaning that without the price (X1), exchange rate (X2) and GDP per Capita (X3) variables, the Malaysian export volume variable (Y) would increase by 59.13728 tons. The constant value for the USA is 59.13728, meaning that without the price (X1), exchange rate (X2) and GDP per Capita (X3) variables, the Malaysian export volume variable (Y) would increase by 59.13728 tons.
b. The coefficient value of the HRG variable for export of cocoa beans (X1) has a positive influence on the VOLEKS variable of 0.707390. This means that if there is an increase in price by one unit and other variables are considered constant, it will increase the export volume of Indonesian cocoa beans to the five main destination countries by 0.707390 tons.
c. The coefficient value of the exchange rate (Exchange) variable (X2) has a positive influence on the VOLEKS variable of 4.806604. This means that if there is an increase in the exchange rate by one unit and other variables are considered constant, it will increase the export volume of Indonesian cocoa beans to the five main destination countries by 4.806604 tons.
d. The coefficient value of the GDP per Capita variable (X3) has a negative influence on the VOLEKS variable of -5.192363. This means that if there is an increase in the value of GDP per Capita by one unit and other variables are considered constant, it will reduce the volume of Indonesian cocoa bean exports to the five main destination countries by -5.192363 tons.

Classic assumption test

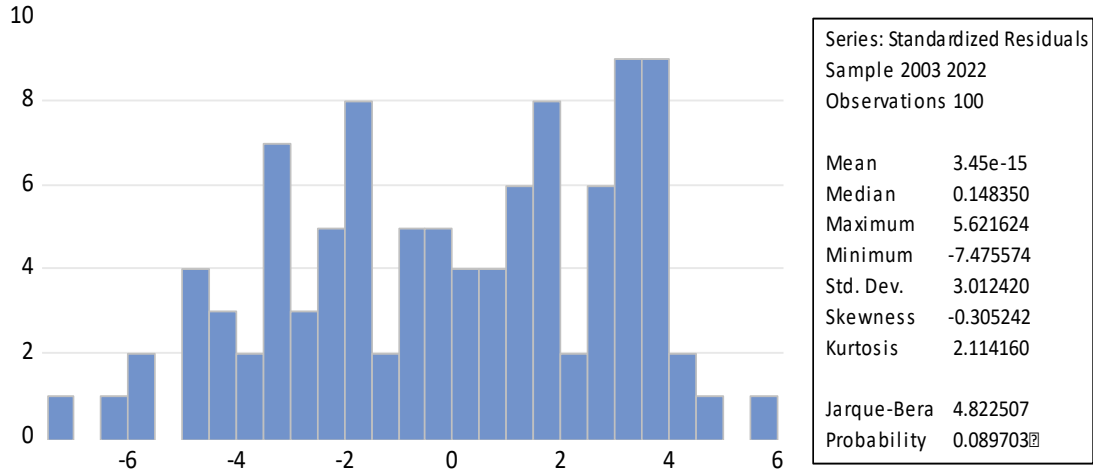
According to (Azuar rt al., 2014) the classical assumption test is a statistical requirement that must be met in analyzing panel data regression based on Ordinary Least Square (OLS) which aims to obtain the best model, in terms of estimation accuracy, unbiased, consistent, precise and valid. In this research, to ensure that the regression model used produces estimation results that are BLUE (Best Linear Unbiased Estimator), classical assumptions were tested. The selected model is the

Fixed Effect Model (FEM), so the classical assumption test used consists of the normality test, multicollinearity test, heteroscedasticity test and autocorrelation test.

1. Normality test

The normality test in this study was carried out to determine whether the data in the study were normally distributed or not. This test can be seen through the Jarque-Bera value in the form of a residual histogram. If the Jarque-Bera probability value is greater than the significance level α = 5% (0.05), then the research data is normally distributed.

Table 6. Normality Test



Source: Eviews 12, 2024

Based on Table 6, normality test, the Jarque-Bera probability value obtained is 0.089703. Where this value is greater than the significance level α = 5% (0.05) so it can be concluded that the variable data in this study is normally distributed.

2. Multicollinearity Test

The multicollinearity test is carried out to identify whether in the regression model there is a correlation between the independent variables and other independent variables. To detect it, you can use other independent correlations. If the correlation value for each independent variable is less than 0.8 then the regression model does not experience multicollinearity problems.

Table 7. Multicollinearity Test

	HRG	EXCHANGE RATE	GDP
HRG	1,000000	-0.229088	0.357405
EXCHANGE RATE	-0.229088	1,000000	-0.672511
GDP	0.357405	-0.672511	1,000000

Source: Eviews 12, 2024

Based on the results of the multicollinearity test using a correlation matrix, the value of each independent variable (price of Indonesian cocoa beans, exchange rates of the five countries, and GDP per Capita of the five countries) has a correlation value of less than 0.8. This means that all independent variables used in the regression model have no correlation between variables or are free from multicollinearity problems.

3. Heteroscedasticity Test

The heteroscedasticity test is carried out to determine whether in a regression model there are differences in the variance of the residuals in a regression model or not. Detecting whether there

is a heteroscedasticity problem in this study or not can be done using the abs (resid) method. If the probability value of each variable is more than α = 5% (0.05), then the regression model does not experience heteroscedasticity problems or the regression model is homoscedastic.

Table 8. Heteroscedasticity Test

Dependent Variable: RESABS
Method: Panel Least Squares
Date: 06/29/24 Time: 12:44
Sample: 2003 2022
Periods included: 20
Cross-sections included: 5
Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.174226	0.550381	-0.316556	0.7523
LOGHRG	-0.009739	0.010484	-0.928965	0.3552
LOGKURS	0.024845	0.047409	0.524057	0.6014
LOGPDB	0.047234	0.050894	0.928092	0.3557

Source: Eviews 12, 2024

Based on Table 8, heteroscedasticity results, the probability value for each independent variable (Indonesian cocoa beans price, exchange rate, and GDP per Capita) shows a value of more than α = 5% (0.05). This means that the regression model used in this research is free from heteroscedasticity or homoscedasticity problems.

4. Autocorrelation Test

The autocorrelation test is carried out to determine in a linear regression model whether there is a correlation between confounding errors in period t and errors in period t-1 (previous). Practically, it can be said that the existing residual values are not correlated with each other. If correlation occurs, it is called an autocorrelation problem. Of course, a good regression model is one that is free from autocorrelation. The basis for decision making in the Durbin-Watson test is carried out by adopting the argument of Singgih (2000), as follows:

a). If the Durbin-Watson number is below –2, it means there is positive autocorrelation.
b). If the Durbin-Watson number is between –2 to +2, it means there is no autocorrelation.
c). If the Durbin-Watson number is above +2, it means there is negative autocorrelation.

Table 9. Autocorrelation Test

Cross-section fixed (dummy variables)

R-squared	0.616863	Mean dependent var	7.392799
Adjusted R-squared	0.587711	S.D. dependent var	3.683564
S.E. of regression	2.365206	Akaike info criterion	4.636226
Sum squared resid	514.6664	Schwarz criterion	4.844639
Log likelihood	-223.8113	Hannan-Quinn criter.	4.720575
F-statistic	21.16041	Durbin-Watson stat	0.621362
Prob(F-statistic)	0.000000		

Source: Eviews 12, 2024

Based on Table 9, the Durbin Watson value obtained is 0.621362. Autocorrelation does not occur if the Durbin Watson value is smaller than 2 and greater than -2, therefore the autocorrelation is 0.621362, so the value is greater than -2 and smaller than 2, so it can be concluded that the results of this study are free from autocorrelation problems so that we can continue to the next test.

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Hypothesis testing

To draw conclusions regarding the hypothesis that has been formulated based on the results of panel data regression using the Fixed Effect Model (FEM) with cross-section weighting, the hypothesis can be tested as follows:

1. Partial Significance Test (t Test)

The t test was carried out to find out how far the individual independent variables influence the dependent variable. Research testing was carried out by comparing the probability values for each independent variable with a significance level of α = 5%.

Table 10. Partial Significance Test (t Test)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	47.67863	11.37402	4.191889	0.0001
LOGHRG?	0.707390	0.114181	6.195341	0.0000
LOGKURS?	4.806604	2.309222	2.081482	0.0402
LOGPDB?	-5.192363	1.286179	-4.037045	0.0001
Fixed Effects (Cross)				
BELGIUM--C	8.519108			
_INDIA--C	-28.64354			
_MALAYSIA--C	-0.827559			
_SINGAPURA--C	9.493348			
_USA--C	11.45865			

Based on Table 10, the partial significance test (t test) on the influence of the independent variable on the dependent variable can be partially concluded as follows:

a. The results of the t test on the Indonesian cocoa bean price (HRG) variable obtained a calculated t value of 6.195341 > t table 1.9845 and a sig value of 0.0000 < 0.05, so H1 was accepted and H0 was rejected, meaning that the bean export price variable (cocoa beans) Indonesian cocoa has a significant influence on the export volume of Indonesian cocoa beans (cocoa beans) to the five main export destination countries for the period 2003-2022.
b. The results of the t test on the Exchange Rate variable (KURS) obtained a calculated t value of 2.081482 > t table 1.9845 and a sig value of 0.0402 < 0.05, so H1 was accepted and H0 was rejected, meaning that the exchange rate variable for the five destination countries Main exports have a significant influence on the volume of Indonesian cocoa beans (cocoa beans) exports to the five main export destination countries for the 2003-2022 period.
c. The results of the t test on the variable GDP per Capita (GDP) obtained a calculated t value of 4.037045 > t table 1.9845 and a sig value of 0.0001 < 0.05, so H1 was accepted and H0 was rejected, meaning that the GDP per Capita variable had an effect significantly to the volume of exports of Indonesian cocoa beans to the five main export destination countries for the period 2003-2022.

2. Simultaneous Significance Test (F Test)

The simultaneous significance test (F test) is carried out to find out how the independent variables influence the dependent variable together. This test is carried out by comparing the probability value of the F-statistic with a significance level of α = 5% (0.05)

Table 11. Simultaneous Significance Test (F Test)

R-squared	0.616863
Adjusted R-squared	0.587711
S.E. of regression	2.365206
Sum squared resid	514.6664
Log likelihood	-223.8113
F-statistic	21.16041
Prob(F-statistic)	0.000000

Based on the regression results using the Fixed Effect Model (FEM) using cross-section weighting, Table 11 shows that the F-statistic value is 21.16041 and the F-statistic probability value is 0.000000. Where the calculated F value is 21.16041 > F table, namely 2.6994 and the sig value is 0.000000 < 0.05 (α = 5%) so that it rejects H0 and accepts H1. Thus, it can be concluded that the independent variables (price of Indonesian cocoa beans, exchange rate, and GDP per capita) together have a significant effect on the volume of Indonesian cocoa bean exports to the five main destination countries for the 2003-2022 period.

3. Coefficient of Determination (Adjusted R2)

The coefficient of determination test was carried out to find out how much ability all the independent variables used in this research have in explaining the dependent variable. The value of the coefficient of determination is between 0 and 1. If the value of the coefficient of determination is close to one, the higher the ability of the independent variable to explain the dependent variable well. On the other hand, if the value of the coefficient of determination is closer to zero, the lower the ability of the independent variable to explain the dependent variable well.

Table 12. Coefficient of Determination (Adjusted R2)

R-squared	0.616863
Adjusted R-squared	0.587711
S.E. of regression	2.365206
Sum squared resid	514.6664
Log likelihood	-223.8113
F-statistic	21.16041
Prob(F-statistic)	0.000000

Based on Table 12, the coefficient of determination test results show that the adjusted R2 value is 0.587711 or 58.7711%. This shows that the independent variables consisting of the price of Indonesian cocoa beans, exchange rates, and GDP per Capita are able to explain their influence on the variable volume of exports of Indonesian cocoa beans to the five main destination countries for the 2003-2022 period of 58 .77% and the remaining 41.23% is explained by other variables outside the study which were not included in this study.

4. CONCLUSION

Based on research conducted on the competitiveness of Indonesian cocoa beans (cocoa beans) in the five main export destination countries during the 2003-2022 period, the following can be concluded:

1. The structure of the Indonesian cocoa beans commodity market, Malaysia, USA, Singapore, India and Belgium, is an oligopoly.
2. The Indonesian cocoa bean commodity has a comparative advantage in five main export destination countries, namely Malaysia, USA, Singapore, India and Belgium with an average RCA value of all greater than one (RCA>1). The highest average RCA value is in Malaysia, namely 271.05, in Singapore, namely 193.89, and in India, namely 96.39. Meanwhile, the other two countries, namely Belgium, were 11.87 and the USA was 8.76.
3. The position of the Indonesian cocoa bean commodity market to the Malaysian market is a position of losing market share which was previously competitive, despite dynamic export market share growth or what is called a Lost Opportunity position, whereas in the other four main export destination countries for Indonesian cocoa beans, namely the USA, Singapore, India, and Belgium, the average value is in a position where the market share of a product is not competitive and export growth is stagnant or called the Retreat position.
4. Indonesian cocoa beans commodities in the three main export destination countries, namely Singapore, India and Belgium, are at the maturity stage with each having an average ISP value

of 0.85, 0.98 and 0.88. Meanwhile, Malaysia and the USA are at the growth stage with an average ISP value of 0.47.

5. Factors influencing the export volume of Indonesian cocoa beans to five main countries, namely Malaysia, USA, Singapore, India and Belgium for the period 2003-2022. The factors that are thought to influence are the export price of cocoa beans, the exchange rate and GDP per Capita. So it can be concluded from the research results that the variables of the export price of cocoa beans, the exchange rate and GDP per Capita are able to influence the variable volume of Indonesian cocoa bean exports by 58%. Where the variable price of exports of cocoa beans, the exchange rate has a positive and significant effect, while GDP per Capita has a negative and significant effect on the decline in the volume of Indonesian exports of cocoa beans.

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