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COMPETITIVENESS AND DETERMINANTS OF INDONESIAN FROZEN SHRIMP EXPORTS TO NON-TRADITIONAL MARKETS

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Abstract: Shrimp is an Indonesian fishery commodity with a high selling value in domestic and international markets. Frozen shrimp, as a type of shrimp exported from fishery products, has enormous potential to be developed as one of the mainstay commodities in the fisheries sector. However, Indonesia's frozen shrimp exports in the last five years have fluctuated and are still unable to compete with competing countries in exporting to main destination countries. Expanding the export market by looking at non-traditional markets as new destination markets to increase its exports again is necessary. This study analyses the competitiveness and determinants of Indonesian frozen shrimp exports to non-traditional markets. The research methods used are Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD), X-Model to analyze the competitiveness and panel data regression to analyze determinants of Indonesian frozen shrimp exports to non-traditional markets. The results showed that Indonesian frozen shrimp are competitive in several non-traditional market destination countries. The estimation results in panel data regression show that the variables of real GDP per capita of the destination country, economic distance, export prices, actual exchange rates, population growth, and Logistic Performance Index (LPI) Indonesian and country of destination have a significant influence on Indonesia's frozen shrimp exports to non-markets traditional.

Keywords: EPD, frozen shrimp, non-traditional market, panel data regresion, RCA, X-Model

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Abstrak: *Udang merupakan komoditas hasil perikanan Indonesia yang memiliki nilai jual tinggi di pasar domestik maupun internasional. Udang beku salah satu jenis udang yang diekspor dari hasil perikanan yang memiliki potensi yang besar untuk dikembangkan sebagai komoditas andalan pada sektor perikanan. Namun dalam lima tahun terakhir mengalami fluktuasi dan kalah bersaing dalam pasar ekspor negara tujuan utama. Dalam upaya menigkatkan ekspor, maka perlu dilakukan perluasan pasar ekspor dengan menjajagi potensi pasar non-tradisional sebagai pasar tujuan baru. Penelitian ini bertujuan untuk menganalisis dayasaing dan determinan ekspor udang beku Indonesia ke pasar non-tradisional. Metode penelitian yang digunakan yaitu Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD), X-Model untuk menganalisis daya saing dan regresi data panel untuk menganalisis determinan ekspor udang beku Indonesia ke pasar non-tradisional. Hasil penelitian menunjukkan bahwa udang beku Indonesia memiliki daya saing yang baik di beberapa negara tujuan pasar non-tradisional. Hasil estimasi pada regresi data panel menunjukkan bahwa variabel GDP riil perkapita negara tujuan, jarak ekonomi, harga ekspor, nilai tukar riil, pertumbuhan populasi, serta Logistic Performance Index Indonesia dan negara tujuan (LPII dan LPIJ) memiliki pengaruh yang signifikan terhadap ekspor udang beku Indonesia ke pasar non tradisional.*

Kata kunci: *EPD, pasar non tradisional, RCA, regresi data panel, udang beku, X-Model*

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INTRODUCTION

International trade is a driving component of the country's economy and has a significant role in increasing economic growth through export and import activities in the form of goods and services. Indonesia is known as a maritime country with a water area of two-thirds of the total territory of Indonesia, which has abundant fishery resources that Indonesia can utilize to increase the country's foreign exchange from the export side. The trade balance of Indonesian fishery products in 5 years, from 2016-2020, has increased by 6.00%. Exports of Indonesian fishery products in 2020 reached US$ 5.205 billion. The export value of fishery products shows a positive trend, with an increase of 5.72% per year from 2016-2020 (Indonesian Ministry of Marine Affairs and Fisheries, 2021).

Shrimp is one of the most desirable fishery products and has a high selling value in both the domestic and international markets. Shrimp is also a commodity with enormous potential to be developed as one of the primary commodities in Indonesia's aquaculture sector. According to the Indonesian Ministry of Marine Affairs and Fisheries (2021), shrimp has a high economic value in international trade in the fishery sector and has contributed significantly to the country's foreign exchange of US$ 2,040 billion or 39.2% of the total value of Indonesian fishery exports and 239,282 tons or 18.95% of the total volume of Indonesian fishery products exported to the main destination market for shrimp exports.

The Indonesian Ministry of Trade (2021) stated that Indonesian shrimp products exported to various countries could be classified into three types: frozen shrimp, fresh shrimp, and processed shrimp. Based on Figure 1, it can be seen that during the 2016-2020 period, the growth of shrimp export value in Indonesia was dominated by frozen shrimp. During the 2016 - 2020 period, the development of Indonesia's frozen shrimp export value to the main export destination countries fluctuated, and in 2017 - 2019 the frozen shrimp export value decreased by 5.5%. Indonesia's frozen shrimp export value growth tends to be lower than its competitors, India, Ecuador and Vietnam, during the 2016-2020 period. Indonesia is ranked 4th after India, Ecuador, and Vietnam can be seen in Figure 2.

Figure 2 shows that the growth of Indonesia's frozen shrimp export value with competing countries has fluctuated and is still far below its competitor countries. The export value of Indonesian frozen shrimp has also decreased over several years. It is presumably due to the increasing competition among shrimp-exporting countries worldwide. Although in 2020, Indonesia's frozen shrimp export value increased, it is still below competing countries.

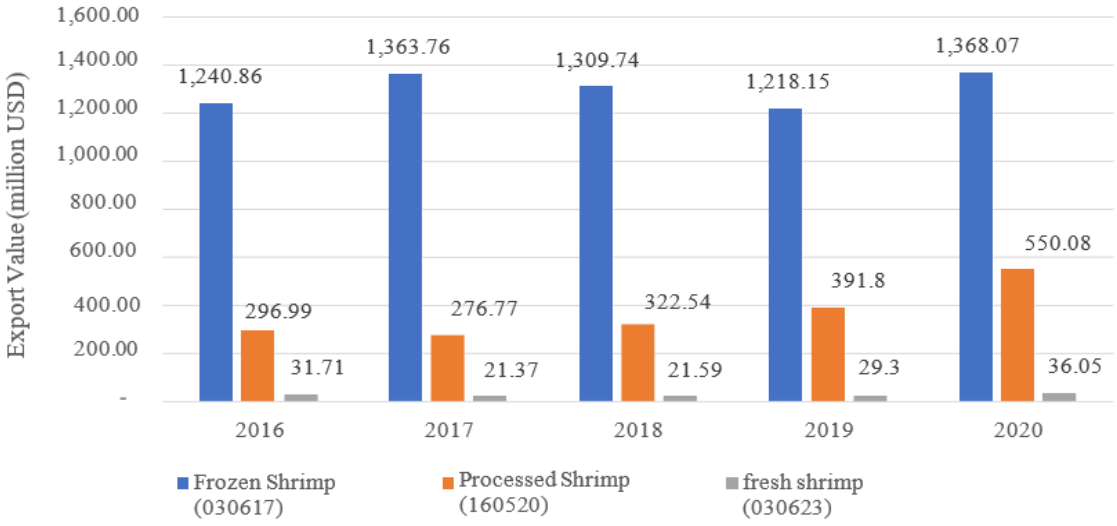

Figure 1. Indonesian shrimp exports value to main destination countries in 2016 - 2020 (Indonesian Ministry of Marine Affairs and Fisheries, 2021)

Indonesia's frozen shrimp export volume during the 2016-2020 period, as shown in Figure 3, also indicates fluctuating growth but tends to increase. Although experiencing fluctuations that tend to increase, Indonesia's frozen shrimp export volume growth during this period was still far below its competitors. The increasing competitiveness of competing countries causes this condition in exporting frozen shrimp.

Wahyudi et al. (2009) show that the competitiveness of Indonesian shrimp exports from 2004-2014 has a weak comparative advantage or weak competitiveness in Malaysia as the main destination market for Indonesian shrimp exports. It is because the condition of the Indonesian shrimp market in Malaysia has a low value due to an increase in dynamic commodity demand but not followed by a positive market share. The decline in the share of shrimp exports is thought to be due to the increasing competition between shrimp-producing countries that export to the main destination countries.

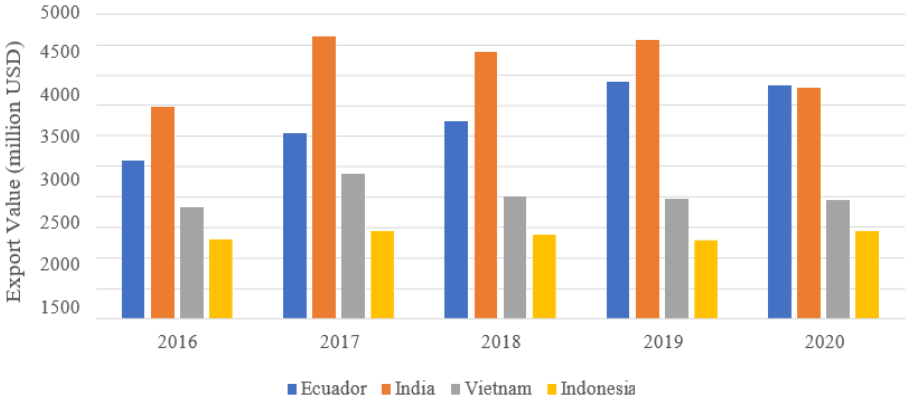

Figure 2. Indonesian frozen shrimp export value and competing countries in 2016 - 2020 (WITS, 2021)

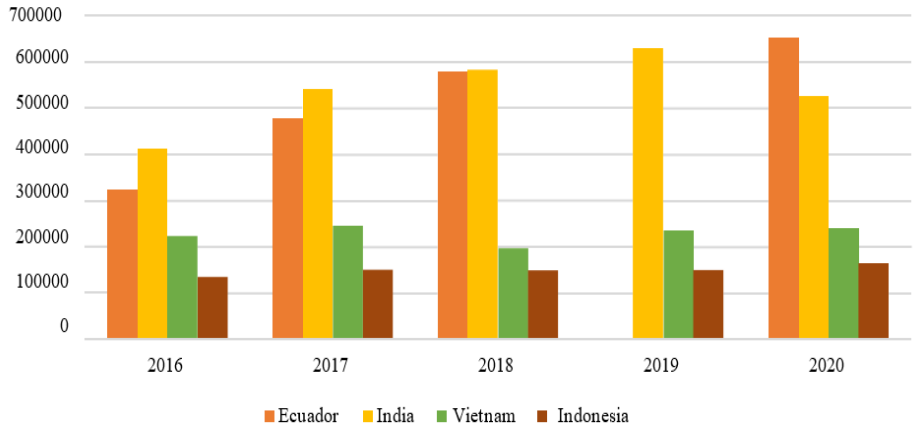

Figure 3. Indonesian frozen shrimp export volume and competing countries in 2016 -2020 (WITS, 2021)

In addition, Pratama (2021) also states that the competitiveness of Indonesia's frozen shrimp tends to decline in China as the main destination for Indonesia's frozen shrimp exports, and is also still unable to compete with its competitors, India and Vietnam, in exporting frozen shrimp to Japan as the main destination for Indonesia's frozen shrimp exports. This detrimental impact on Indonesia because frozen shrimp is a fishery product that can contribute significantly to shrimp exports. It damages Indonesia because frozen shrimp is a fishery product that can contribute considerably to shrimp exports. Therefore, to increase the export share of Indonesian frozen shrimp, it is necessary to expand or diversify the export market to new export destination markets by looking at non-traditional markets as new export destination markets.

According to Sabaruddin (2016), non-traditional markets are economically potential and prospective countries as market destinations for Indonesia, such as countries in Latin America, Central and Eastern Europe, Africa, South and Central Asia and the South Pacific. Sabaruddin (2016) and Hotsawadi & Widyastutik (2020) have grouped and classified non-traditional countries as new destination markets for export activities. Based on this research, several non-traditional market countries that have been grouped and have the potential for Indonesia to export frozen shrimp in this study are Belgium, the Russian Federation, Canada, France, Spain, Sweden, Trinidad & Tobago, and Greece, which are the highest non-traditional market countries for Indonesian frozen shrimp.

In addition, other important things in increasing competitiveness in international trade activities can be seen in the performance of a country's logistics sector. The performance of the logistics sector in a country needs to be considered to support international trade activities properly. According to Gani (2017), the quality and efficiency of logistics services are a problem for international trade because weak logistics infrastructure and operational processes can be significant obstacles to international trade. A good logistics performance system is needed for a country to compete in international trade activities. The quality of the logistics performance system can be seen and measured through the Logistics Performance Index (LPI). So in this study, the LPI of Indonesia as an exporting country and the LPI of the destination country need to get attention and become a factor that affects the export of Indonesian frozen shrimp to non-traditional market destination countries. Increasing global market competition, in terms of product quality and quantity, pose a threat to Indonesian trade in the international market (Ciffolilli and Muscio, 2018). Therefore, a more comprehensive and integrated effort is needed to increase the market share of Indonesia's frozen shrimp exports by diversifying the export market and seeing the potential for exports to non-traditional market countries as a new destination market. Based on the background that has been described, this study aims to: analyzing the competitiveness and export potential of Indonesian frozen shrimp commodities in non-traditional market countries and analyzing determinants of Indonesia's frozen shrimp exports to non-traditional market countries.

METHODS

This study uses secondary data from various sources, such as WITS, World Bank, CEPII, and other related literature (Table 1). This study uses panel data, which is a combination of time series data with a period of 9 years (2012 - 2020) and cross-section data with a focus on eight non-traditional countries such as Belgium, the Russian Federation, Canada, France, Spain, Sweden, Trinidad & Tobago, and Greece. The selection of non-traditional countries was based on research by Hotsawadi & Widyastutik (2020) and Sabaruddin (2016) by considering a large number of Indonesian frozen shrimp exports to these non-traditional countries and based on existing data, potential importers of frozen shrimp from Indonesia. This study's types of shrimp were frozen with the 2012 HS code nomenclature HS 030617.

The analytical method used in this research is quantitative analysis. The methods used are RCA (Revealed Comparative Advantage), EPD (Export Product Dynamic) and X-Model to analyze the competitiveness and export potential of Indonesian frozen shrimp processed using Microsoft Excel 365. The panel data regression method was also used to analyze determinants of Indonesia's frozen shrimp exports to non-traditional market export destinations using the Eviews9.

Tabel 1. Data types and sources

Data types	Sources	Unit
Indonesian frozen shrimp export volume	WITS	Ton
Real GDP per capita of destination countries	World Bank	Ton
Economic distance	CPII	Km
Export price of non tradisional market destination	WITS	USD/Ton
Real exchange rate of non-tradisional market destination	World Bank	IDR/LCU
Population growth of non-tradisional market destination	World Bank	%
Logistics Performance Index of Indonesia	Word Bank	(Index 1-5)
Logistics Performance Index of non-tradisional destination	Word Bank	(Index 1-5)

Revealed Comparative Advantage (RCA)

RCA is a method that can be used to measure the competitiveness of Indonesian frozen shrimp commodity, and the RCA formula mathematically as follows:

RCA = (Xijt / Xjt) / (Wijt / Wjt)

Description: Xijt (Value of Indonesian's commodity i export to country j in year t (USD)); Xjt (Indonesia's total exports to country j in year t (USD)); Wijt (Value of world exports of commodity i to country j in year t (USD)); Wjt (Total world exports to country jin year t (USD)).

There are two possible results from the calculation of RCA. If the value of RCA > 1 means that I is competitive above the average, so the commodity is said to have strong competitiveness. On the other hand, when the value of RCA <1, the commodity has a comparative advantage below the average and is said to be weakly competitive.

Export Product Dynamic (EPD)

The EPD method is an indicator used to see whether or not the performance of a commodity is dynamic. EPD can also describe the competitive position of certain products in certain markets, such as frozen Indonesian shrimp, to non-traditional markets. Conditions that may appear in the EPD analysis are divided into four categories. An explanation of the four quadrants of the EPD in Figure 4, namely: Lost Opportunity: indicates a lost markets share, but the commodity is still dynamic; Rising Star: shows that the commodity's market share is dynamic or growing very fast; Retreat: shows negative demand on the market share of the commodity; Falling Star: shows an indication of an increase in market share, but the demand for the commodity is decreasing.

Sumbu X: export market share growth =

$$\frac{\sum_{t=1}^{t}\left(\left(\frac{Xijt}{Wijt}\right)\mathrm{t}\times 100\%\right)-\left(\left(\frac{Xijt-1}{Wijt-1}\right)t-1\times 100\%\right)}{T}$$

Sumbu Y: product market share growth =

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

Description: Xijt (Export value of Indonesian commodity I to destination country j in year t); Wijt (Value of world commodity i exports to destination country j in year t); Xjt (Nilai total ekspor Indonesia ke negara tujuan j pada tahun t); Wjt (Total value of Indonesia's exports to destination country j in year t); T (Number of years); t (Year -t); i (Frozen shrimp commodity).

X-Model

X-Model is an analytical method that combines the results of RCA and EPD analysis. This method determines the potential development of Indonesian frozen shrimp commodities. The analysis results on the X Model method are divided into four market groupings: optimistic, potential, less potential and non-potential markets. An explanation of market grouping on the X-Model is shown in Table 2.

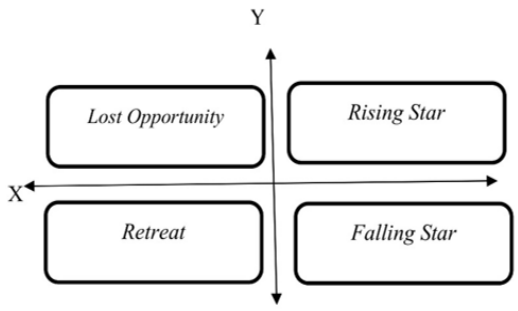

Figure 4. EPD quadrant

Tabel 2. Market grouping on X-Model

RCA	EPD	X-Model (Market Development)
RCA > 1	Rising Star	Optimistic
	Lost Opportunity	Potensial
	Falling Star	Potensial
	Retreat	Less Potensial
RCA < 1	Rising Star	Potensial
	Lost Opportunity	Less Potensial
	Falling Star	Less Potensial
	Retreat	No Potensial

The Panel Data Regression Analysis

Panel data regression analysis is used to analyze the determinants of Indonesian frozen shrimp export to non-traditional market countries. The regression model is:

$$\ln VOL_{jt} = \alpha + \beta_1 \ln GDPRCAP_{jt} + \beta_2 \ln EDIST_{ijt} + \beta_3 \ln PX_{jt} + \beta_4 \ln RER_{jt} + \beta_5 POP_{jt} + \beta_6 \ln LPII_{it} + \beta_7 \ln LPIJ_{jt} + \varepsilon_{ijt}$$

$\beta 1 > 0$; $\beta 2 < 0$; $\beta 3 < 0$; $\beta 4 < 0$; $\beta 5 > 0$; $\beta 6 > 0$; $\beta 7 > 0$

Description: ln VOLjt (Indonesian frozen shrimp export volume to non-traditional market destination countries (tons)); ln GDPRCAPjt (Real GDP per capita of non-traditional market destination countries (US$)); ln EDISTjt (Economic distance (km)); ln PXjt (Export price of non-tradisional market destination coutries (US$/ton)); ln RERjt (Real exchange rate of non-traditional market destination countries (IDR/ LCU)); POPjt (Population growth of non-traditional market destination countries (%)); ln LPIIit (Logistics Performance Index of Indonesia (Index 1-5)); ln LPIJjt (Logistics Performance Index of Destination Countries (Index 1-5)); α (Intercept); βn (Estimated parameters (n=1, 2, 3, …n)); εijt (Error term); i (Indonesia); j (Non-traditional market destination); t (Time series).

RESULTS

Competitiveness and Export Potential of Indonesian Frozen Shrimp and Competing Countries in Non-Traditional Markets

The results of the calculation of the RCA score of frozen Indonesian shrimp to non-traditional market export destination countries for the 2012-2020 period shown in Table 3 show that the RCA score in each country studied during the 2012-2020 period showed fluctuating growth. This condition is influenced by the development of export trends in the country. However, the average RCA score shows an RCA > 1 in Belgium, the Russian Federation, Canada, France, Spain, Sweden, Trinidad & Tobago, and Greece. It shows that Indonesia's frozen shrimp commodities have a comparative advantage or have strong competitiveness in non-traditional market destination countries. Meanwhile, Spain has an average RCA score of less than one, which means it has weak competitiveness in that country.

Overall, based on these countries, Trinidad & Tobago is a non-traditional destination country that has the highest average RCA score compared to other non-traditional countries, which is 114.9. Canada is the second country with the highest average RCA score, 20.81. Furthermore, the countries with the highest average RCA score were followed by Sweden, France, Belgium, the Russian Federation, and Greece, which also had an average RCA score of more than one. Meanwhile, in Spain, Indonesian frozen shrimp does not have a comparative advantage and has weak competitiveness for export, indicated by an RCA score that less than one (RCA < 1). It is because Spain is still Ecuador's biggest importer of frozen shrimp.

Table 3 shows the results of the estimated average RCA score for Indonesia and the three other export competitor countries, such as India, Ecuador, and Vietnam. In Table 3, it can be seen that India and Ecuador have a comparative advantage or have strong competitiveness overall non-traditional market export destinations except frozen shrimp in Indonesia, which has weak competitiveness in Spain, with an average RCA score during the period 2012 - 2020 at 0.14. In addition, frozen shrimp in Vietnam also have weak competitiveness in Spain, with an average RCA score during the 2012 - 2020 period of 0.65. During this period, Vietnam did not export frozen shrimp commodities to Trinidad & Tobago. The four countries have comparative

advantages and have strong competitiveness in different export destination countries. In Ecuador, it can be seen that the average RCA score of frozen shrimp in Ecuador during 2012 - 2020 has a higher RCA score in all non-traditional destination countries compared to other export competitor countries. It is because the export value of frozen shrimp from Ecuador to non-traditional destination countries has increased yearly.

The EPD method analyses the dynamics of Indonesian frozen shrimp commodity exports. In this EPD analysis, there are four possible positions in the Indonesian frozen shrimp market: Rising Star, Lost Opportunity, Falling Star, and Retreat. Table 4 shows the estimation results of Indonesian frozen shrimp EPD to non-traditional market export destinations in 2012 - 2020.

The EPD estimation results show that the position of Indonesian frozen shrimp is in a rising star position in five countries, namely Belgium, the Russian Federation, Canada, Trinidad & Tobago, and Greece. The rising star market position is ideal, showing that Indonesian frozen shrimp are competitively competitive in the five countries. It shows that during the period from 2012 to 2020, Indonesian frozen shrimp commodities experienced rapid growth, which was followed by an increase in demand for Indonesian frozen shrimp commodities from these five countries. The competitiveness of frozen shrimp from Indonesia to Spain is in the falling star position. This position indicates an increase in the export market share but the market share of these products decreases. It will impact the loss of Indonesian competition opportunities in fulfilling the demand for Indonesian frozen shrimp in Spain, making this condition less favourable for Indonesia.

Table 3. Estimated results of The RCA value of indonesian frozen shrimp to non-traditional market destination countries for The Period 2012-2020

Destination Countries	Year									Average of RCA
	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Belgia	15.54	4.92	6.34	2.43	3.41	6.7	5.84	11	4.11	6.7
Federasi Rusia	16.78	8.49	0.32	0.53	0.91	1.68	3.8	2.74	4.94	4.47
Kanada	21.98	16.1	29.13	17.6	19.01	15.57	20.2	26.1	21.7	20.81
Prancis	17.6	11.4	8.41	5.43	8.26	7.06	8.96	10.3	10.7	9.79
Spanyol	0.04	0.06	0.15	0.07	0.05	0.18	0.16	0.22	0.28	0.14
Swedia	54.62	42.5	13.87	8.54	10.95	11.67	22.5	8.39	6.15	15.57
Trinidad and Tobago	102	147	155.4	126	118.9	150.9	76.5	99.5	58.4	114.9
Yunani	0.002	0.82	1.8	0.47	1.42	6.33	6.16	5.82	2.89	3.22

Table 4. Estimated results of The EPD value of indonesian frozen shrimp to non-traditional market destination countries for The Period 2012-2020

Destination Countries	EPD Value		EPD Position
	Product Market Share Growth (%)	Export Market Share Growth (%)	
Belgium	3.883	0.306	Rising Star
Russian Federation	41.717	8.126	Rising Star
Canada	5.701	0.685	Rising Star
French	-3.525	-1.027	Rising Star
Spain	58.144	-3.863	Rising Star
Sweden	-11.558	1.264	Rising Star
Trinidad & Tobago	12.146	14.970	Rising Star
Greece	6064.551	3.976	Rising Star

In Sweden, it can be seen that the competitive position of Indonesian frozen shrimp in Sweden is in a lost opportunity condition, which indicates that Indonesian frozen shrimp exports have decreased when demand for frozen shrimp has increased. It means that Indonesia has not been able to take advantage of the opportunities available in the Swedish market. Besides that, the position of competitiveness of Indonesian frozen shrimp based on EPD calculations shows that several countries are in a retreat position, that as France. The results of this EPD estimate indicate that the Indonesian frozen shrimp commodity has lost the opportunity to increase its product market share and export market share. The retreat position also shows that the products produced by a country do not have a competitive advantage and are no longer desirable in the importing country, and at the same time, there is a decline in global frozen shrimp demand which will have an impact on the decline in Indonesia's frozen shrimp demand.

The X-Model analysis is carried out by considering the results of the RCA and EPD analysis that have been obtained to cluster the potential for product development and focus on the trading market. Table 5 shows the results of the X-Model analysis of Indonesian frozen shrimp commodities in non-traditional market destination countries. Indonesian frozen shrimp commodity exports have optimistic market development potential in Belgium, the Russian Federation, Canada, Trinidad & Tobago, and Greece. It indicates that the development of the frozen shrimp export market in the export destination country has high potential with strong competitiveness and is in a rising star position. In Sweden, Indonesian frozen shrimp exports to that country have less potential market potential. Although Indonesian frozen shrimp exports in Sweden are a lost opportunity, this market still has the potential to be developed because Indonesian frozen shrimp have strong competitiveness in this market. Meanwhile, other non-traditional countries, namely France and Spain, have less potential market development for export development to these countries. Although in France, Indonesian frozen shrimp are still highly competitive, the retreat position shows that the country does not want Indonesian frozen shrimp products to be imported by the country. Likewise with Spain, although the EPD positions of the two countries are in falling stars position, based on the average RCA score of Indonesian frozen shrimp, which is less than one (RCA < 1), it indicates that Indonesian frozen shrimp do not have a comparative advantage and compete weakly to export frozen shrimp to Spain. It suggests that the two countries are not suitable for export targets.

The Determinant of Indonesian Frozen Shrimp Exports to Non-Traditional Market Destinations

In this research, the panel data regression method is used, which can be estimated using three approaches, there are Pooled Least Square (PLS), Fixed Effect Model (FEM) and Random Effect Model (REM). The Chow and Hausman test was tested to select the best model, and the estimation results in Table 6. The results of the Chow test to determine the best model between PLS and FEM. The probability value is 0.000, which means less than the 5% significance level. This condition shows sufficient evidence to reject H0 so that FEM is the best model compared to PLS. Furthermore, the results of the Hausman test obtained a probability value of 1.00, which indicates more significance than the 5% actual level so that the estimation results show that H0 is not rejected and H1 is rejected. It can be concluded that the test results are invalid (Cross-section test variance is invalid). Hausman statistic is set to zero). It is in line with the results of research from Agustina (2017) and Gujarati (2006), which conclude that the Fixed Effect Model (FEM) is better used in panel data.

The results of the panel data regression estimation are shown in Table 7. Table 7 shows that the model has an R-squared value of 0.9645 which means that 96.45% of changes in the volume of Indonesian frozen shrimp exports to non-traditional destination countries can be explained by independent variables in the model, while other factors explain the remaining 3.55%.

Furthermore, the model must be tested for classical assumptions to obtain the BLUE model (Best Linear Unbiased Estimator). Four classical assumption tests can be performed: multicollinearity test, heteroscedasticity test, autocorrelation test, and normality test. A multicollinearity test was conducted to see whether there was a linear relationship between the model's independent variables. The results of the multicollinearity test show that the correlation value between the independent variables is less than 0.8 (Spearman's Rho Correlation) or does not exceed the R-squared value, so it can be concluded that there is no multicollinearity problem. Based on the heteroscedasticity test, the Sum Square Resid in Weighted Statistics results are more significant than the Sum Squared Resid in Unweighted Statistics, namely 63.778 > 28.454, so the model is free from heteroscedastic problems.

Table 5. The results of The X-model analysis of Indonesian frozen shrimp to non-traditional market destination countries for the period 2012-2020

Importing Countries	Average RCA	Position EPD	Export Potential Products
Belgium	6.699	Rising Star	Optimistic Market Development
Russian Federation	4.465	Rising Star	Optimistic Market Development
Canada	20.811	Rising Star	Optimistic Market Development
French	9.790	Retreat	Less Potential Market Development
Spain	0.135	Falling Star	Less Potential Market Development
Sweden	15.569	Lost Opportunity	Potential Market Development
Trinidad & Tobago	114.896	Rising Star	Optimistic Market Development
Greece	3.215	Rising Star	Optimistic Market Development

Table 6. The results of Chow Test and Hausman Test

Model Test	Probability value	Estimated Results
Chow Test	0.0000	Reject H0, then FEM
Hausman Test	1.0000	Invalid, then FEM

Table 7. The results of the panel data regression estimation of Indonesian frozen shrimp exports to non-traditional market destination countries

Dependent Variable: LN_VOL		
Independent Variable	Coefficient	Probability
LN_GDPRCAP	2.015 *	0.028
LN_EDIST	-2.605 **	0.000
LN_PX	-1.295 **	0.000
LN_RER	-4.035 **	0.000
POP	0.800 **	0.000
LN_LPII	3.874 **	0.000
LN_LPIJ	6.920 **	0.000
C	-49.275	0.000
Weighted Statistics		
R-squared		0.9645
Prob (F-statistic)		0.0000
Sum square resid		65.7588
Durbin-Watson stat		2.18504
Unweighted Statistics		
Sum squared resid		44.2050

**), *) significant at 1%, 5% significant level

The results of the autocorrelation test can be seen from the Durbin Watson (DW) value of 2.185 which indicates that this model is in the area where there is no autocorrelation (1.80 < DW < 2.19), so this shows that there is no autocorrelation problem in the model. This autocorrelation assumption test can be done because the estimation model uses a fixed effect model (FEM) with weighted Generalized Least Squares (GLS) cross-section SUR so that the model is free from autocorrelation. It refers to Juanda (2009), who explains that Generalized Least Squares (GLS) can overcome autocorrelation and heteroscedasticity. It is also in accordance with the research of Nurhayati et al. (2019). While the normality test is carried out to detect whether the error term is normally distributed or not, judging by the probability value of Jarque Bera, which shows a value of 0.509713 greater than a 5% significance level, it can be interpreted that the data in the model is normally distributed.

The model used in this study needs to be tested for normality assumptions and classical assumption tests to obtain the BLUE model (Best Least Unbiased Estimator). Based on the normality test, the Jarque Bera probability value of 0.216469 is greater than the 5% significance level indicating the residual is normally distributed. The multicollinearity test showed that the correlation value between variables was less than 0.8, indicating no multicollinearity. The Durbin-Watson value of 1.847857 is between the statistical value interval of Durbin-Watson DU < DW < 4-DU, which indicates no autocorrelation.

The heteroscedasticity test can be known by looking at the value of sum squared resid in weighted and unweighted data. The value of sum squared resid in weighted statistics is smaller than that of sum squared resid in unweighted statistics, which is 2.432376 < 2.470477, indicating a heteroscedasticity problem. According to Juanda (2009), the issue of heteroscedasticity can be overcome using the Generalized Least Squares (GLS) method. This model uses GLS weighting, which means the model is free from heteroscedasticity problems.

The results of panel data regression estimation show that all independent variables significantly influence the volume of Indonesian frozen shrimp exports. Variables that have a significant negative effect are the real exchange rate has a coefficient of -4.035, economic distance -2.605, and prices in destination countries -1.295. The actual exchange rate variable has a negative relationship, where if the exchange rate appreciates, it will cause prices in the destination country to be relatively more expensive. It shows that if there is an increase in the real exchange rate of 1 percent, the volume of frozen shrimp exports will decrease by 4 percent. To increase frozen shrimp exports, the government must maintain a stable exchange rate with the destination country. An appreciating real exchange rate will make export prices more expensive in the destination country. Economic distance is a variable that describes transportation costs, so the higher the transportation costs, the lower the export volume. If the economic distance increases by one percent, the volume of exports will decrease by 2.6 percent. To increase export volume, export destinations are prioritized over relatively closer destination countries. In this model of frozen shrimp export demand in non-traditional markets, the export price in the destination country harms demand. Because of the higher price, the consumer's willingness to buy will decrease. The high price illustrates the commodity's lack of competitiveness in the destination country's export market. A one percent increase in export prices in destination countries will reduce export volumes by 1,3 percent. An increase in export prices will reduce export competitiveness in the destination countries.

The variables of real GDP per capita of destination countries, population growth, and LPI (Logistics Performance Index) of Indonesia and destination countries have a significant positive effect. The real GDP per capita of the destination country has a coefficient of 2.015, population growth of 0.800, Indonesian LPI of 3.87 and the LPI of the destination country of 6.920. The GDP per capita variable reflects the purchasing power of the destination country. To increase exports, priority must be given to destination countries with relatively high purchasing power. Population growth is a reflection of market potential. To increase Indonesia's frozen shrimp export, exports are prioritized to destination countries with relatively larger populations due to their larger market potential. The LPI variable of the destination country has the largest elasticity, followed by the Indonesian LPI variable, where the LPI variable describes the condition of the existing logistics system. A good logistics system will make the delivery of goods run more effectively and efficiently to improve export performance.

These findings from the research above are in accordance with the findings of previous researchers, namely Pradipta (2012); Elshehawy (2014); Gani (2017); Muharami and Novianti (2018); Nurhayati et al. (2019); Hotsawadi and Widyastutik (2020); Pratama (2021) and Harta (2021).

Manajerial Implications

To increase Indonesia's frozen shrimp export, it is necessary to carry out a market expansion strategy by diversifying the market into a non-traditional market. From the existing data, seven countries are included in the non-traditional countries of the Indonesian frozen shrimp market. Exports should be prioritized to non-traditional markets, which are included in the optimistic market development criteria. What are Belgium, the Russian Federation, Canada, Trinidad & Tobago. Then the non-traditional market country in the criteria for potential market development is Sweden. At the same time, Frace and Spain are included in the less potential market development category. Export is prioritized by

countries with a relatively stable exchange rate, high purchasing power potential, good logistics system performance, and close economic distance. Indonesia must also improve the performance of its logistics system and improve the price competitiveness of frozen shrimp in non-traditional market destination countries.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The results of the competitiveness analysis using the RCA and EPD methods show that Indonesian frozen shrimp have a comparative advantage or have strong competitiveness in seven non-traditional market export destinations. Meanwhile, there is one country where Indonesian frozen shrimp does not have a comparative advantage or has weak competitiveness in that country, namely Spain. The EPD method's estimation results show that Indonesian frozen shrimp are in a rising star position in Belgium, the Russian Federation, Canada, Trinidad & Tobago, and Greece. The position of the falling star is shown in Spain. Sweden is in a lost opportunity position, while France is in a retreat position. The analysis results using the X-Model method, which is used to see the potential of a country to export, show that Belgium, the Russian Federation, Canada, and Trinidad & Tobago have an optimistic market development. Sweden has potential market development, while France and Spain have less potential market development. The results of panel data regression show that the real exchange rate, export price, and economic distance significantly negatively affect the demand for frozen shrimp export volume in non-traditional markets. In contrast, the population growth and the Logistics Performance Index (LPI) of Indonesia and the destination country significantly positively impact Indonesian frozen shrimp export volume.

Recommendation

Indonesia needs to increase the production and quality of Indonesian frozen shrimp to compete with competing countries in exporting shrimp, considering that the RCA value of Indonesian frozen shrimp in several export destination countries for non-traditional markets is still below the competing countries. The government can maintain and continue developing the Indonesian frozen shrimp export market by focusing on non-traditional countries with optimistic market developments, such as Belgium, the Russian Federation, Canada, and Trinidad & Tobago. Besides that, an increase in the volume and value of exports to Sweden is also needed because Sweden has a potential export market development, so the growth rate of Indonesia's frozen shrimp exports continues to increase yearly.

To increase Indonesia's frozen shrimp exports in non-tradisional markets, it should be prioritized to countries with good logistics systems, high purchasing power/ GDP per capita, and relatively close economic distance to a relatively larger population. The government must also maintain a stable exchange rate for export destination countries. Indonesia must also improve its logistics system's performance and the price competitiveness of frozen shrimp in non-traditional market destination countries.

For further research, we can analyze the potential of other types of shrimp products in non-traditional markets and add other variables such as tariff and non-tariff barriers and other important and relevant variables on export growth rates.

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