

## Determinant of Indonesian Frozen Shrimp Export Volume to Japan

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### ABSTRACT

Shrimp is a leading export commodity in the fisheries sector in Indonesia, playing a significant role in generating foreign exchange earnings, particularly through exports to the United States and Japan. Despite its importance, the volume of Indonesian frozen shrimp exports to Japan has fluctuated in recent years. This research investigates the key factors influencing these export volumes, focusing on frozen shrimp production, international shrimp prices, the USD to IDR exchange rate, and Gross Domestic Product (GDP) of Japan). Data were sourced from UN COMTRADE, the World Bank, Statistics Indonesia (BPS), the Ministry of Marine Affairs and Fisheries, the Japan External Trade Organization (JETRO), and Trade Statistics of Japan. A quantitative research approach was employed, using multiple linear regression analysis to determine the relationships among the variables. The findings revealed that frozen shrimp production, the exchange rate, and GDP of Japan have a significant impact on export volumes, while international shrimp prices do not show a statistically significant effect. Among these, the GDP of Japan emerged as the most influential factor. Based on these results, policy recommendations include the enhancement of international branding, formulation of comprehensive production planning, and the improvement of product value and quality.

**Keywords:** *international trade, export, frozen shrimp, Japan, multiple linear regression*

### BACKGROUND

International trade refers to business transactions conducted between parties from more than one country (Diphayana, 2018). Global trade has grown at an average rate of 6% per year over the past two decades (IMF, 2001). International trade enables the more efficient use of global resources. Through international trade, countries can specialize in production to gain comparative advantages (Arifin et al., 2007). Moreover, international trade relations contribute to improving the overall quality of life among nations (Puji, 2019). Fisheries represent a vital component of economic activity, offering significant potential to support livelihoods and increase fishers's income, thereby contributing to the core objectives of fisheries development (Hamidi et al., 2011). The marine and fisheries sector plays a strategic role in national economic

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development, particularly in terms of job creation, protein-based food supply, and foreign exchange generation (Nurlina, 2018). Among various fishery commodities, shrimp is a major contributor to the international trade (OECD, 2021). Shrimp, along with tuna, skipjack, and seaweed, is recognized as one of Indonesian top non-oil and gas export commodities in the marine and fisheries sector. However, shrimp provides the largest share of foreign exchange earnings from this sector (Sugianto, 2017). This commodity significantly supports the growth of the fisheries subsector, accounting for approximately 60% of its total export value. As a result, the Indonesian government has designated shrimp as one of the country's leading export commodities (Pudyastuti et al., 2018).

Indonesia has exported shrimp to various international markets, with the United States and Japan identified as the primary destinations. Japan, as the second-largest importer of Indonesian shrimp, is known for its high seafood consumption. To meet its domestic demand, Japan depends heavily on seafood imports (Lokadata, 2016). It is also recognized that Japan as the world's largest importer of fishery products. Moreover, Japanese consumers have a strong preference for a wide range of seafood, including fish, octopus, sea urchins, crabs, shrimp, seaweed, and squid. Related to shrimp, Japan is considered the largest shrimp-consuming country globally (Sugianto, 2017). These conditions present a significant opportunity for Indonesia to expand shrimp exports to international markets, particularly to Japan (Saputri, 2017). Among the various shrimp products, frozen shrimp is regarded as a commodity with strong export potential due to its high market value and development prospects (Sukadana & Wiharani, 2021). Table 1 presents data on the net weight and Free on Board (FOB) value of Indonesian frozen shrimp (HS 030616) exports to Japan from 2012 to 2020.

**Table 1.** Indonesian Frozen Shrimp (HS 030616) Exports to Japan, 2012–2020

<b>Net Weight and FOB Value of Indonesian Frozen Shrimp (HS 030616) Exports to Japan, 2012–2020</b>		
Year	Net Weight (kg)	FOB Value (Thousand US\$)
2012	2.633.983	32.995.038
2013	2.593.325	30.851.062
2014	2.183.860	29.357.811
2015	2.209.605	23.556.750
2016	1.571.688	18.209.978
2017	950.501	13.047.036
2018	625.796	10.164.003
2019	138.240	1.774.963
2020	274.860	3.114.405

Source: Statistics Indonesia (BPS) & UN Comtrade, 2021

Based on this data, the volume of Indonesian frozen shrimp exports (HS 030616) to Japan has fluctuated. According to Sugianto (2017), in 2012, Thailand experienced an outbreak of Early Mortality Syndrome (EMS) in shrimp, while Indonesia remained unaffected, leading to an increase in Indonesian shrimp exports. However, in 2014, Indonesian shrimp exports to Japan decreased due to the depreciation of the Japanese Yen against the US Dollar and an increase in Japan consumption tax to 8%, which led to a decline in both Japanese distributors and consumer demand for shrimp.

Asnawi et al. (2021), who conducted an analysis of the factors influencing the demand for Indonesian shrimp exports in international markets, concluded that the estimation of the

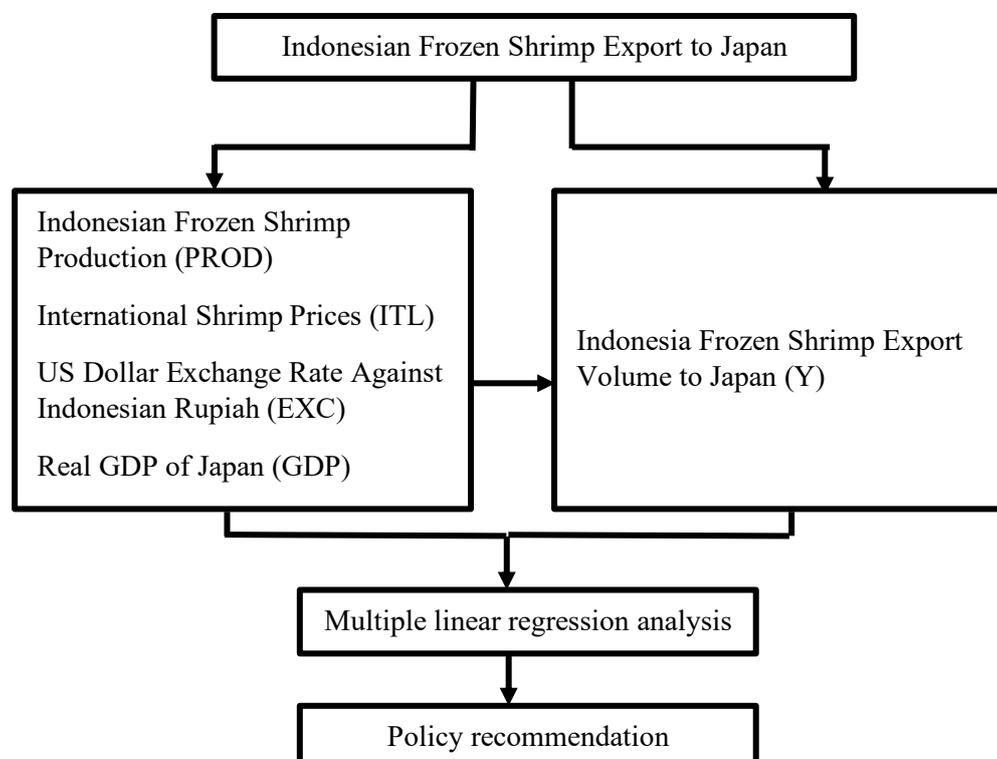
export demand function for fresh shrimp in the United States, Japan, and the European Union is influenced by factors such as the export price of shrimp to the destination countries, domestic shrimp prices, the lag (time delay) in fresh shrimp exports to the destination countries, domestic shrimp production, and the gross product value of the destination countries.

Given this background, Indonesia, as a country with vast fisheries potential and the capacity to produce shrimp in large quantities, holds significant opportunities to increase its foreign exchange earnings through export activities in international trade. Indonesia is considered to have strong potential for exporting frozen shrimp to various destination countries, including Japan. However, in recent years, the export performance of Indonesian frozen shrimp to Japan has shown fluctuations with a declining trend. In order to identify the factors contributing to this fluctuating and downward trend and to formulate strategic policy recommendations, this research was conducted.

## RESEARCH METHODS

### Conceptual Framework

The volume of Indonesian frozen shrimp exports to Japan has fluctuated with a downward trend in recent years. This research examines the influence of Indonesian frozen shrimp production, international shrimp prices, the exchange rate of the US Dollar against the Indonesian Rupiah, and GDP of Japan on the export volume of Indonesian frozen shrimp to Japan. The conceptual framework of this research is illustrated in Figure 1.



**Figure 1.** Conceptual Framework of The Research

## Scope of The Research

This research aims to analyze the factors influencing Indonesian frozen shrimp exports to Japan, focusing on four main variables: Indonesian frozen shrimp production, international shrimp prices, the exchange rate of the US Dollar against the Indonesian Rupiah, and the GDP of Japan. Other factors not examined in this research are assumed to remain constant and their effects are disregarded. The research utilizes export data for frozen shrimp under HS codes 030613 and 030616, with values expressed in USD, covering the period from 1980 to 2020. Through this research, it is expected that deeper insights into the dynamics of Indonesian frozen shrimp exports will be gained, particularly in addressing the declining export trend, thereby enabling the formulation of relevant policy recommendations to enhance the stability and performance of Indonesian frozen shrimp exports in the future.

## Location and Period of The Research

This research was conducted while in Indonesia and Japan, with the data collection spanning from 1980 to 2020, using secondary data obtained from the United Nations Commodity Trade Statistics Division (UN COMTRADE), the World Bank, Statistics Indonesia (BPS), the Ministry of Marine Affairs and Fisheries of Indonesia (KKP), the Japan External Trade Organization (JETRO), and the Trade Statistics of Japan.

## Types and Methods of Data Collection

This research utilizes time series data from 1980 to 2020, using HS codes 030613 and 030616. The data sources include the United Nations Commodity Trade Statistics Division (UN COMTRADE), the World Bank, Statistics Indonesia (BPS), the Ministry of Marine Affairs and Fisheries of Indonesia (KKP), the Japan External Trade Organization (JETRO), and the Trade Statistics of Japan. The data on Indonesian shrimp production from 1980 to 2020 was obtained from the Export Statistics of Fisheries Products, Ministry of Marine Affairs and Fisheries (KKP). Data on international shrimp prices were sourced from the World Bank, exchange rate data for the US Dollar against the Indonesian Rupiah was sourced from Statistics Indonesia (BPS), and data on Gross Domestic Product (GDP) of Japan were obtained from the World Bank. The volume of Indonesian frozen shrimp exports to Japan was sourced from the Ministry of Marine Affairs and Fisheries (KKP) and UN COMTRADE. For the period from 1980 to 2011, the data used HS code 030613, while data from 2012 to 2020 used HS code 030616.

## Data Analysis

This research employs a quantitative method as its primary approach, using multiple linear regression to analyze the determinant factors that affecting the volume of Indonesian frozen shrimp exports to Japan, based on time series data. Quantitative research is a systematic investigation of an case through the collection of measurable data using mathematical, statistical, and computational methods (Ramdhan, 2021). In order to obtain a comprehensive understanding of the extent to which independent variables influence the dependent variable, multiple linear regression analysis is employed (Zano and Santoso, 2019). This research uses a multiple linear

regression analysis model (Gujarati, 2003). The following is the regression equation used in this research.

$$EXP = \beta_1 + \beta_2PROD + \beta_3ITLP + \beta_4EXC + \beta_5GDP + \mu$$

In which:

EXP	= Volume of Indonesian Frozen Shrimp Exports to Japan
PROD	= Indonesian Shrimp Production
ITL	= International Shrimp Price
EXC	= Exchange Rate of the Yen against the US Dollar
GDP	= Gross Domestic Product (GDP) of Japan
$\beta_1$	= Intercept
$\mu$	= Stochastic Disturbance Error
$\beta_2, \beta_3, \beta_4, \beta_5,$ and $\beta_6$	= Parameters

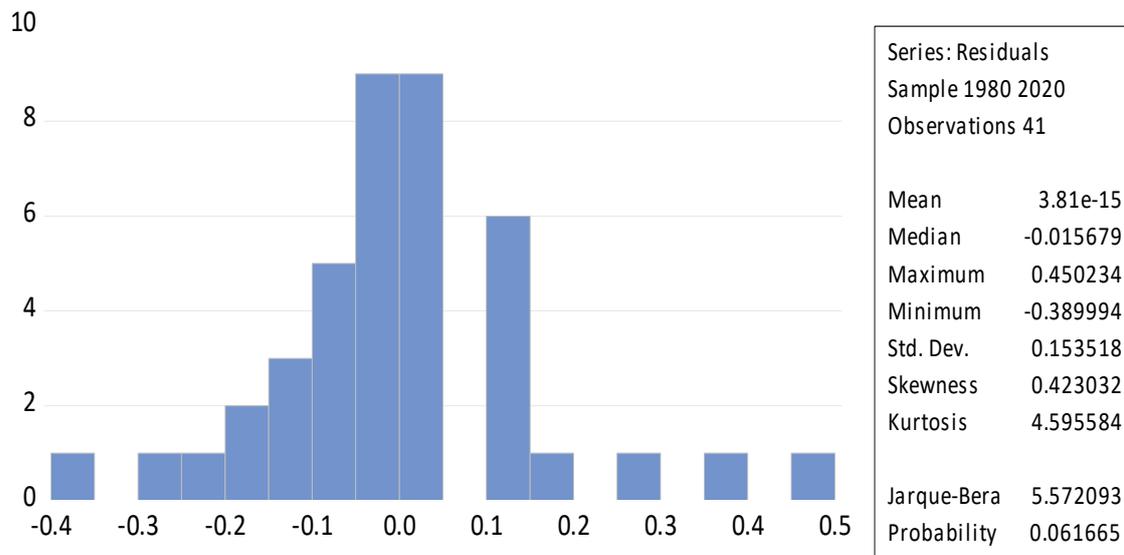
Several classical assumption tests were conducted before building the multiple regression model, to ensure that the research results are not biased. The normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test are some of the more common assumption tests performed. The coefficient of determination ( $R^2$ ) test, t-test (partial), and F-test (simultaneous) were also used in this research. The purpose of regression analysis is to determine and measure the extent of the influence of independent variables on the dependent variable, as well as to predict the dependent variable using the independent variables. Regression analysis is called multiple linear regression when there is more than one independent variable (Kurniawan & Budi, 2016). In this research, the dependent variable is the volume of Indonesian frozen shrimp exports to Japan, while the independent variables include Indonesian shrimp production, international shrimp prices, the exchange rate of the US Dollar against the Indonesian Rupiah, and Gross Domestic Product (GDP) of Japan. The method used to calculate the coefficients of the independent variables from the regression equation in this research is the Ordinary Least Squares (OLS) method. According to Yudiaatmaja (2013), the Ordinary Least Squares (OLS) method, also known as the classical method, produces the most accurate equation when the sum of squared residuals is minimized. The residual value refers to the difference between the actual data and the predicted data. Therefore, the smaller the sum of squared residuals, the better the resulting equation. Prior to conducting multiple linear regression analysis, it is essential to perform tests for deviations or classical assumption tests.

## RESULTS AND DISCUSSIONS

### Classical Assumption Tests

#### *Normality Test*

The normality test is conducted to determine whether the dependent and independent variables are normally distributed or not, as data that is normally or approximately normally distributed is required for the success of the regression model. The results of the normality test using the Jarque-Bera test are presented in Figure 2.



**Figure 2.** Normality Test  
Source: Secondary Data Analysis, 2022

From the results of the normality test in Figure 2, it is known that the data has a Jarque-Bera value of 5.572093 with a p-value of 0.061665, which is greater than 0.05, indicating that the data is normally distributed.

**Multicollinearity Test**

The multicollinearity test using the Variance Inflation Factor (VIF) is conducted to determine the presence or absence of multicollinearity. A VIF value greater than 10 is considered to indicate multicollinearity in the regression model. The results of the VIF test indicate that none of the VIF values exceed 10. The VIF value for the PROD variable is 2.018230, for the INTLP variable is 1.010941, for the EXC variable is 8.681333, and for the GDP variable is 7.357776.

**Heteroscedasticity Test**

The heteroscedasticity test is used to determine whether there is homogeneity of variance of the residuals for all observations of each independent variable in the regression model. The results of the heteroscedasticity test using the White method, indicate a p-value of 0.7883, which exceeds the significance level ( $\alpha = 0.05$ ). Consequently, the null hypothesis ( $H_0$ ) is accepted, suggesting that the data exhibit homoscedasticity and there is no indication of heteroscedasticity in the regression model.

**Autocorrelation Test**

The autocorrelation test is used to determine whether there is a correlation between the residual errors at time and the errors at the previous period (t-1). The results of the autocorrelation test using the Breusch-Godfrey test shows that the p-value of the Obs\*R-squared is 0.6501. Therefore, the regression model does not exhibit autocorrelation.

**Statistical Test Results**

The following table presents the statistical tests used in the regression model of this research, shown through the coefficient of determination ( $R^2$ ), the F-test (simultaneous) and the t-test (partial).

**Table 1.** Results of the Regression Analysis of Indonesian Frozen Shrimp Exports to Japan from 1980 to 2020

<b>Variables</b>	<b>Coefficient</b>	<b>Std. Error</b>
PROD	-0,515440***	0,045525
INTLP	-0,190703 <sup>ns</sup>	0,180902
EXC	-0,171045**	0,073044
GDP	2,671181***	0,345964
Constant	-14.63855	4,749093
<b>R-squared</b>	0,848453	
<b>F-statistic</b>	50,38748***	

Source: Secondary Data Analysis, 2022

Explanation:

- \*\*\* : Significant at 99%
- \*\* : Significant at 95%
- \* : Significant at 90%
- ns : Not significant

**Coefficient Determination Test (R<sup>2</sup>)**

The coefficient of determination (R<sup>2</sup>) test is employed to assess the extent to which the independent variables in the regression model can account for the variation in the dependent variable. A higher R<sup>2</sup> value indicates a greater explanatory power of the independent variables in the model. In the regression analysis, the R-squared value obtained is 0.848453, means that 84.4853% of the variance in the model is explained by the logarithmic values of Indonesian shrimp production, international shrimp prices, the exchange rate between the US Dollar and the Indonesian Rupiah, and Gross Domestic Product (GDP) of Japan. The remaining 15.5146% of the variance is considered outside of the model.

**F-test (Simultaneous)**

The F-test (simultaneous test) is conducted to determine the overall effect of the independent variables in the model to the dependent variable. If the significance level of the variables is smaller than  $\alpha$ , it is considered significant, indicating that all independent variables simultaneously have an impact on the dependent variable. Based on the results of the simultaneous statistical test, the significance value obtained is  $(0.000) < \alpha = 0.05$ , thus indicating that the regression model is significant. Therefore, the volume of Indonesian frozen shrimp exports to Japan (Y) is simultaneously significantly influenced by all independent variables in this research, namely Indonesian shrimp production (PROD), international shrimp prices (INTLP), the exchange rate of the US Dollar to the Indonesian Rupiah (EXC), and Gross Domestic Product (GDP) of Japan.

According to the theoretical concept by Salvatore (2003), several factors influence the export volume of a commodity, including the quantity of production and the price of the commodity. Furthermore, Mankiw (2009) also stated that exports are influenced by international prices, domestic production, the consumption level of the destination country for the commodity, exchange rates, and the GDP or income of the destination country's population. In this research, it was found that the variables of Indonesian Shrimp Production (PROD), International Shrimp Prices (INTLP), the Exchange Rate of the US Dollar to the Indonesian Rupiah (EXC), and Gross Domestic Product (GDP) of Japan simultaneously have a significant effect on the dependent variable Y (Volume of Indonesian Frozen Shrimp Exports to Japan) is accepted.

This result is supported by Suryanto (2016) entitled “The Impact of Exchange Rates, Gross Domestic Product, and Rubber Production on Indonesian Rubber Exports”, which concluded that from 2003 to 2013, the exchange rate, GDP, and rubber production variables simultaneously influenced Indonesian rubber exports. Similar previous research by Mejaya et al. (2016) concluded that from 2010 to 2013, the volume of Indonesian tea exports was simultaneously influenced by the variables of production, international prices, and exchange rates.

### *t-test (Partial)*

The t-test (partial test) aims to determine whether each independent variable in the model individually has a significant effect on the dependent variable. A variable is considered significant if its significance value is smaller than  $\alpha$ . The multiple linear regression equation can be concluded as follows:

$$\ln X = -14,63855 - 0,515440 \ln PROD_{it} - 0,190703 \ln INTLP_{it} - 0,171045 \ln EXC_{it} + 2,671181 \ln GDP_{it}$$

The value of -14.63855 represents the initial volume of Indonesian frozen shrimp export to Japan when there is no influence from the independent variables.

### **The Determinants Results**

#### ***PROD (Indonesian Shrimp Production)***

The PROD (Indonesian Shrimp Production) variable with Y (Volume of Frozen Shrimp Exports from Indonesia to Japan) shows a Sig. value of  $(0.0000) < \alpha = 0.05$ , which means that  $H_0$  is rejected and  $H_1$  is accepted. Therefore, it can be concluded that the PROD (Indonesian Shrimp Production) variable has a negative impact on the Volume of Frozen Shrimp Exports from Indonesia to Japan, with a regression coefficient of -0.515. This implies that an increase of one unit in Indonesian Shrimp Production (PROD) will result in a decrease of 0.515 tons in the Volume of Frozen Shrimp Exports (Y), assuming that all other variables remain constant.

This result contradicts the theory of factors influencing exports, where an increase in production is expected to be followed by an increase in export supply. Furthermore, the findings of this research are not aligned with the research of Ashari et al. (2016), which concluded that, in the long term, the production of frozen shrimp in Indonesia significantly impacts the export competitiveness of Indonesian frozen shrimp in destination countries. The higher the domestic shrimp production, the greater the export supply, as shrimp consumption is considered relatively stable.

The discrepancy between the findings of this research and the existing theory may be attributed to several factors, including the instability or rapid changes in the international market. When domestic production increases, it does not always result in a corresponding increase in the export volume of commodities to specific countries. This was evident during the years 1994 to 1997, 2003 to 2005, and 2009 to 2019, where an increase in domestic production was not accompanied by an increase in export volume to Japan. Furthermore, in 2004 and 2012, Japan also rejected shrimp imports from Indonesia due to concerns over the use of the antibiotic Chloramphenicol in processing Vannamei shrimp. One of the Japan requirements for shrimp products is that they must be antibiotic-free. Japan is also a country that imposes non-tariff trade barriers on imported products, which can limit the export volume of frozen shrimp from Indonesia. According to Deswati et al. (2016), a common non-tariff barrier faced by Indonesian

shrimp exporters in the Japanese market is the requirement for testing, certification, and ecolabeling. Ardiyanti & Saputri (2018) also noted that Indonesian shrimp exporters continue to face difficulties in meeting the standards and regulations of export destination countries, including Japan.

The increase in domestic production that is not followed by an increase in export volume to Japan could be due to the fact that Japan is the second-largest importer of frozen shrimp from Indonesia, while the United States holds the top position. According to data from UN Comtrade, between 1995 and 2011, there was an increase in frozen shrimp exports from Indonesia to the United States. In 2011, Indonesia exported 2,633,983 kg of shrimp to Japan (HS code 030613), while the United States received 53,796,720 kg. Therefore, Japan is not the primary destination for frozen shrimp exports from Indonesia. Additionally, exports to the United States are of higher value and more profitable compared to exports to Japan. According to Lokadata (2016), in 2015, the largest shrimp export was sent to the United States, valued at 745.3 million USD, while exports to Japan were valued at 306.6 million USD, followed by exports to China at 75.4 million USD, and Malaysia at 16.4 million USD.

### ***INTLP (Shrimp International Prices)***

The INTLP (International Shrimp Price) variable with Y (Volume of Indonesian Frozen Shrimp Exports to Japan) shows a significance value (Sig.) of 0.2988, which is greater than  $\alpha = 0.05$ . This means that  $H_0$  is accepted and  $H_1$  is rejected. Therefore, it can be concluded that, on a partial basis, the INTLP (International Shrimp Price) variable has an insignificant effect on the volume of Indonesian frozen shrimp exports to Japan.

This is supported by Adam Smith theory of absolute advantage in international trade, which states that a country producing a particular commodity will export it to countries that do not have that commodity. The country that does not produce the commodity will continue to import it from the country that does, regardless of price fluctuations, in order to meet its domestic demand.

The results of this research are similar to the research conducted by Wahyuni et al. (2021), where international palm oil prices have a negative but insignificant effect on the export demand for Indonesian palm oil. Furthermore, Dimantara & Septina (2020) also concluded that the export prices of commodities do not have a significant effect on the export of frozen shrimp from Indonesia to its destination countries.

Indonesia is one of the largest shrimp producers in the world. It is therefore understandable that the demand for frozen shrimp exports continues despite fluctuations in prices. Saputri (2017) stated that Japan is highly dependent on food imports due to its limited natural resources. As a result, Japan will continue to import, regardless of whether international prices rise or fall.

### ***EXC (Exchange Rate of The US Dollar to The Indonesian Rupiah)***

The EXC (Exchange Rate of the US Dollar to the Indonesian Rupiah) variable with Y (Volume of Indonesian Frozen Shrimp Exports to Japan) shows a significance value (Sig.) of 0.0248, which is less than  $\alpha = 0.05$ . This indicates that  $H_0$  is rejected and  $H_1$  is accepted. Therefore, it can be concluded that the EXC variable (Exchange Rate of the US Dollar to the Indonesian Rupiah) has a negative influence on the volume of Indonesian frozen shrimp exports to Japan, with a regression coefficient of -0.1710. This means that if the Exchange Rate of the US Dollar to the Indonesian Rupiah (EXC) increases by one unit, the volume of Indonesian

frozen shrimp exports (Y) will decrease by 0.1710 tons, assuming all other variables are held constant.

This finding contradicts the theory which states that an increase in the US Dollar exchange rate leads to an increase in export volume (Wedasmara, 2022). Furthermore, Sukadana & Wiharani (2021) suggest that exports and imports are affected by the depreciation or appreciation of a currency within a floating exchange rate system. An appreciation of the US Dollar exchange rate results in foreign consumers having broader access and greater purchasing power. Therefore, the exchange rate of foreign currencies is expected to have a positive relationship with exports.

The increasing trend in the exchange rate of the US Dollar against the Indonesian Rupiah from 1980 to 2020 indicates that the Rupiah has depreciated, making domestic goods cheaper compared to goods in foreign markets. As a result, depreciation leads to an increase in exports. This finding is contradicted with the theory proposed by Illegbinosa et al. (2012), which states that exchange rates have a positive relationship with exports. However, this research supports the previous research conducted by Setyorani (2018), which found that exchange rates have a significant and negative impact on exports.

Therefore, when the exchange rate of the US Dollar against the Indonesian Rupiah appreciates, the volume of exports in this research is expected to decrease. This is because when the Dollar increases, shrimp farmers face difficulties in purchasing shrimp feed. Rahma (2021) reveals that Indonesia still imports a significant number of fish and shrimp feed. Consequently, when the Dollar increases or the Rupiah depreciates, production costs rise, leading to a decrease in exports.

### ***GDP (Gross Domestic Product of Japan)***

The GDP (Gross Domestic Product of Japan) variable with Y (Volume of Frozen Shrimp Exports from Indonesia to Japan) shows a Sig. value of  $(0.0000) < \alpha = 0.05$ , which means  $H_0$  is rejected and  $H_1$  is accepted. Therefore, it can be concluded that the variable of GDP (Gross Domestic Product of Japan) has a positive effect on the Volume of Frozen Shrimp Exports from Indonesia to Japan, with a regression coefficient of 2.6711. This means that when the Gross Domestic Product of Japan (GDP) increases by one unit, the Volume of Frozen Shrimp Exports from Indonesia (Y) will increase by 2.6711 tons, assuming other variables are held constant.

This research aligns with consumption theory, which states that consumer expenditure is influenced by the level of income achieved. Consumption expenditure will increase by a certain amount when income also increases. Kurniasari & Monica (2019) stated that an increase in GDP indicates that people's purchasing power rises, leading to increased consumption of both domestic and imported products. The results of this research are aligned with the research conducted by Mashari et al. (2019), which found that the volume of frozen and processed shrimp exports from Indonesia is influenced by the real GDP per capita of the destination country. Furthermore, Alwafi (2016) also stated that the volume of shrimp exports from Indonesia is significantly and positively influenced by the GDP of the destination country.

### **The Most Influential Factor on the Volume of Frozen Shrimp Exports from Indonesia to Japan**

The following presents the Standardized Coefficients for the variables of Indonesian Shrimp Production (PROD), Exchange Rate of the US Dollar to the Indonesian Rupiah (EXC), and Gross Domestic Product (GDP) of Japan, as shown in Table 2.

**Table 2.** Standardized Coefficients for the Factors Affecting the Volume of Frozen Shrimp Exports from Indonesia to Japan (1980 - 2020)

<b>Variables</b>	<b>Standardized Coefficient</b>
C	NA
PROD	-1,043596
EXC	-0,447653
GDP	1,358840

Source: Secondary Data Analysis, 2022

The purpose of the Standardized Coefficients is to determine the factor that most influences the volume of frozen shrimp exports from Indonesia to Japan. Based on the data analysis results, it is found that the Standardized Coefficients for each variable are as follows: the Domestic Shrimp Production variable is -1.043596, the International Shrimp Price variable is -0.068770, the Exchange Rate of the US Dollar to the Indonesian Rupiah variable is -0.447653, and the Gross Domestic Product of Japan variable is 1.358840. This indicates that the Gross Domestic Product of Japan has the most dominant influence on the volume of frozen shrimp exports from Indonesia to Japan from 1980 to 2020, compared to the Domestic Shrimp Production, International Shrimp Price, and Exchange Rate of the US Dollar to the Indonesian Rupiah variables.

Sukirno (2006) states that the income of a country's citizens is one of the main components in determining imports. When the income of citizens is high, it increases the demand for imports, and vice versa. Additionally, Saputri (2017) mentions that a high economic growth rate in Japan results in an increased domestic demand for export products.

## CONCLUSION AND SUGGESTION

Simultaneously, the variables of Indonesian frozen shrimp production, international shrimp prices, the exchange rate of the US Dollar to the Indonesian Rupiah, and Gross Domestic Product (GDP) of Japan have a significant impact on the volume of Indonesian frozen shrimp exports to Japan. The variables of Indonesian frozen shrimp production, the exchange rate of the US Dollar to the Indonesian Rupiah, and Gross Domestic Product (GDP) of Japan significantly influence the volume of Indonesian frozen shrimp exports to Japan, whereas the variable of international shrimp prices does not have a significant effect on the volume of Indonesian frozen shrimp exports to Japan. The variable that has the most significant influence on the volume of Indonesian frozen shrimp exports to Japan is the Gross Domestic Product (GDP) of Japan.

Based on the findings in this research, several policy recommendations can be proposed to strengthen the Indonesian performance in frozen shrimp export to Japan. These recommendations encompass the enhancement of international branding, the formulation of comprehensive production planning, and the improvement of product value and quality.

It is important to enhance international branding strategy, particularly within the Japanese market. Indonesian frozen shrimp products compete with the other exporting countries to Japan, such as Thailand and Vietnam. In light with this intense competition, it is essential for Indonesian government and relevant stakeholders to emphasis the branding strategies of the product. These may include the development of visual appealing and informative packaging, the inclusion of national and international quality certifications, the sustainability regarding

food safety of the products.

Precise planning at the production stage is required. This recommendation based on the finding that GDP of Japan exerts the most significant influence on Indonesian frozen shrimp export volume. In anticipation of rising demand following an increase in GDP of Japan, both the government and industry stakeholders must be equipped to respond effectively.

Enhancing the overall quality and value of frozen shrimp products is of paramount importance. Given that Japan has stringent food safety and quality standards, there must be continuous quality assurance from upstream to downstream stages. Improving in high quality standards will not only improve product competitiveness but also reinforce Indonesian reputation as a reliable supplier in the international seafood market, particularly in Japan.

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