ANALYSIS OF DETERMINANTS THAT INFLUENCE THE VOLUME OF INDONESIAN SHRIMP EXPORTS TO MAIN DESTINATION COUNTRIES FOR THE 2013-2022 PERIOD

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Abstract

Among several superior marine and fisheries commodities owned by Indonesia, shrimp is one of the superior commodities that has quite large potential. This potential has not been utilized properly, even though shrimp is currently a commodity that has high economic value. Problems related to the condition of Indonesia's export volume tend to fluctuate, this is very important to pay attention to in order to find out the determinants that influence the increase and decrease in the volume of Indonesian shrimp exports to destination countries. The aim of this research is to analyze the simultaneous and partial influence of GDP per capita, population, inflation rate and US dollar exchange rate on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period. The analysis technique used is a panel data regression model with 70 observations obtained through secondary data. The model chosen is the FEM model and the classical assumption tests used are the multicollinearity test and heteroscedasticity test. The results of this research, namely GDP per capita and the inflation rate have a positive but not significant effect on the volume of Indonesian shrimp exports to the main destination countries in 2013-2022, population has a positive and significant effect on the volume of Indonesian shrimp exports to the main destination countries in 2013-2022 , the dollar exchange rate has a negative and significant effect on the volume of Indonesian shrimp exports to the main destination countries in 2013-2022.

Keywords: GDP per capita, population, inflation rate, US dollar exchange rate

INTRODUCTION

In an effort to better understand the contribution of the Indonesian fisheries sub-sector to international trade, the following is Table 1 which displays the export volume of fishery products based on various commodities in the 2018-2022 period in million US$.

Table 1. Export Volume of Fishery Products by Commodity for the 2018-2022 Period (Million US$)

Year	Volume (Million US$)				
	Shrimp	Tuna, Tuna, Skipjack	Squid, Cuttlefish, Octopus	Crab, Crab	Seaweed
2018	1,742.12	713.92	554.59	472.96	291.84

2019	1,719.17	747.54	556.29	393.5	324.85
2020	2,040.18	724.1	509.22	367.52	279.28
2021	2,228.95	732.94	618.93	613.25	345.11
2022	2,157.13	960.27	737.13	484.23	600.36
Amount	**9,871.55**	**3,878.77**	**2,976.16**	**2,331.46**	**1,841.44**

Source:Ministry of Maritime Affairs and Fisheries, 2023

Table 1 shows that the shrimp commodity is ranked first in Indonesia's fisheries export commodities, namely 2,157.13 million US$ in 2022. Even though it has decreased compared to the previous year, namely 2021, which reached 2,228.95 million US$, the shrimp commodity still occupies top position compared to other commodities. VolumeThe continuing increase in shrimp exports encourages Indonesia to continue exporting the fisheries sector, especially shrimp commodities. Since 1987 Indonesia has been one of the most important shrimp suppliers in the world. (Wati et al., 2016)

To win the market in export destination countries, Indonesia needs to pay attention to what products are exported and what the market structure is (Ningsih et al., 2016). Shrimp is one of the leading commodities in fisheries, because the growth rate in the number of exports increases every year so that Indonesia exports this commodity. The number of Indonesian shrimp exports is still relatively fluctuating, but remains the mainstay of Indonesian fishery exports with a large international market share.

In the context of shrimp commodity exports, Indonesia has become one of the main players in the international market. The following is Table 2 which shows the export volume of shrimp commodities according to the main destination countries in the 2018-2022 period in tons.

Table 2 Shrimp Commodity Export Volume According to Main Destination Countries for the 2018-2022 Period (tons)

Country	Export Volume (tons)				
	2018	2019	2020	2021	2022
Japan	25,112	24,447	24,155	25,212	26,686
China	5,979	9,842	11,840	5,044	17,369
Canada	1,094	1,337	1,197	2,277	2,118
Malaysia	1,803	1,610	1,109	1,375	1,796
South Korea	740	761	708	1,160	932
Singapore	802	855	519	523	818
Vietnamese	1,562	516	184	182	293

Source: United NationsComtrade, 2024

Table 2 shows the export volume of shrimp commodities by main destination country, providing a very important picture of the direction of Indonesian shrimp exports. Japan is ranked first as the highest export destination for Indonesian shrimp with a total export volume of 125,612 tons in 2018-2022, then second place is occupied by China, namely50,074tons in 2018-2022, third place is occupied by Canada, namely 8,023 tons in 2018-2022, fourth place is occupied by Malaysia, namely 7,693 tons tonnes in 2018-2022, ranked fifth, namely South Korea at4,301tons in 2018-2022, ranked sixth, namely Singapore amounting to3,517 tonsin 2018-2022, and finally Vietnam amounting to 2,737 tons in 2018-2022 (United Nations Comtrade, 2024).

Indonesia is one of the main producers of shrimp in the world, with significant production volumes. Most of this shrimp production is directed to the export market. This shows how Indonesian shrimp production makes an important contribution to the country's economy through international trade. Indonesia's shrimp production, which increases every year, has given its own meaning in increasing foreign exchange from non-oil and gas exports, because shrimp has shown its dominance as one of the mainstay export commodities on the world market.

Shrimp production in Indonesia will reach 1.48 million tons with a value of IDR 92.69 trillion in 2022. This amount is up 21.25% compared to the previous year which amounted to 1.22 million tons with a value of IDR 77.02 trillion (Ministry of Maritime Affairs and Fisheries, 2023). The volume of shrimp production experienced a decline in 2018-2020, but increased again in 2021-2022. This increase not only has a positive impact on the fisheries sector, but also makes an important contribution to Indonesia's economic growth.

The increase in shrimp production has driven an increase in GDP per capita, this shows how the fisheries sector can act as a driver of Indonesia's economic growth. With increasing shrimp production and associated economic growth, Indonesia is increasingly demonstrating great potential in utilizing its natural resources to support sustainable economic prosperity.

Gross Domestic Product (GDP) is the market value of all final goods and services produced in a country in a certain period. GDP is an appropriate measure of welfare because people prefer high income to low income (Mankiw, 2016).

Gross Domestic Product (GDP) measures the total expenditure on newly produced goods and services in an economy and the total income earned from the production of these goods and services. Gross Domestic Product (GDP) means the income a country obtains from the economic activities they carry out (Wiharani, 2021).

The main destination country is one of the factors that influences the comparison of GDP per capita in various countries. Through Table 3 of GDP per

capita in the 2018-2022 period in US$ units below, it can be seen how income varies among the main destination countries for Indonesian shrimp exports, namely Japan, China, Vietnam, Malaysia, Canada, Singapore and Korea South.

Table 3. GDP per Capita of Main Destination Countries for the 2018-2022 Period (US$)

Country	GDP per Capita (US$)				
	2018	2019	2020	2021	2022
Singapore	66,836.50	66,070.50	61,274.00	77,710.10	82,807.60
Canada	46,548.60	46,374.20	43,562.40	52,515.20	55,522.40
Japan	39,751.10	40,416.00	40,040.80	40,058.50	34,017.30
South Korea	33,447.20	31,902.40	31,721.30	35,142.30	32,422.60
China	9,905.40	10,143.90	10,408.70	12,617.50	12,720.20
Malaysia	11,074.00	11,132.10	10,164.30	11,134.60	11,993.20
Vietnamese	3,267.20	3,491.10	3,586.30	3,756.50	4,163.50

Source: World Bank, 2024

The GDP per capita of Singapore, Canada, Japan, South Korea, China, Malaysia and Vietnam is a reflection of the economic strength and differences in the level of social welfare in these countries. Ranked first, namely Singapore with GDP per capita354,698.70 US$ in 2018-2022. Second, Canada with a GDP per capita of 244,522.80 US$ in 2018-2022. Third, namely Japan with GDP per capita of 194,283.70 US$ in 2018-2022. Fourth, namely South Korea with GDP per capita of 164,635.80 in 2018-2022. Fifth, China with GDP per capita of 55,795.70 US$ in 2018-2022. Sixth, Malaysia with a GDP per capita of 55,498.20 US$ in 2018-2022. Lastly, Vietnam with a GDP per capita of 18,264.60 US$ in 2018-2022 (World Bank, 2024)

Gross Domestic Product (GDP) has a close relationship with the population of the country to which shrimp is exported. When GDP per capita increases, people tend to have more purchasing power which can increase demand for consumer products such as shrimp. A high population can create a large domestic market.

A large population in a country can be used as a potential market that will drive various kinds of economic activities, because of the large demand for various kinds of goods and services. Apart from that, it can create economies of scale in production which will benefit interested parties, reduce production costs, and provide cheap labor in sufficient quantities so that in the end it will stimulate higher levels of output or aggregate production (Todaro, 2003). This shows that increasing the population of a country will increase the number of commodities purchased. Table 4 shows data on the population of the main destination countries for the period 2018-2022 in million people.

Table 4. Population of Main Destination Countries (million people)

Country	Population (million people)				
	2018	2019	2020	2021	2022
China	1,405,410	1,410,080	1,412,120	1,412,600	1,411,750
Japan	126,435	126.144	125,651	125,651	124,861
Vietnamese	95,385	96,484	97,538	98,504	99,474
South Korea	51,585	51,765	51,836	51,770	51,673
Canada	37,073	37,618	38,029	38,240	38,939
Malaysia	32,382	32,523	32,447	32,576	32,698
Singapore	5,639	5,704	5,686	5,454	5,637

Source: World Bank, 2024

Table 4 shows that the main destination countries for Indonesian shrimp exports, namely China, Japan, Vietnam, South Korea, Canada, Malaysia and Singapore, experience changes in population levels every year. Japan has experienced a population decline in 2020-2022, the lowest level being in 2022 amounting to 124,861 million people. Meanwhile, Vietnam, Canada, Malaysia and Singapore will experience an increase in population in 2022, namely Vietnam, with a population of 99,474 million, Canada with a population of 38,939 million, Malaysia with a population of 32,698 million and Singapore with a population of 5,637 million soul. Meanwhile, China, even though it has a very large population, will experience a decline in 2022 compared to the previous year. In 2022 China's population level will be1,411,750million people, which has decreased compared to 2021 with a population level of1,412,600million people. South Korea also experienced a decline in population in 2022 which amounted to51,673million people (World Bank, 2024).

Another factor that influences the volume of shrimp exports is inflation. Inflation is an increase in the price of goods that occurs continuously. In general, the cause of inflation in developed countries is identified as growth in the money supply, whereas in developing countries inflation is not a pure phenomenon, but is usually related to fiscal imbalances.

Inflation is a general and continuous increase in the prices of goods and services over a certain period of time. An increase in the price of just one or two goods cannot be called inflation unless the increase is widespread or results in an increase in prices for other goods (Bank Indonesia, 2020).

If inflation in a country continues to increase, it will cause domestic prices of goods to rise so that the price of domestic goods is much more expensive than the price of goods from abroad so that people are more inclined to import goods. Inflation tends to increase imports (Pratama, 2008). If goods and services produced abroad are of better quality or cheaper in price, there will be a tendency to import (Batubara, 2015).

If the increase occurs excessively, it will reduce the enthusiasm for production and consumption and risks triggering hyper inflation and a reduction in the volume of a country's exports (Akbar, 2012). The development of inflation in the main destination country experienced fluctuations which affected the volume of Indonesian shrimp exports to that country. There is an increase and decrease in the inflation percentage every year in the main destination countries for the volume of Indonesian shrimp exports. Japan, China, Vietnam, Malaysia, Canada, Singapore and South Korea will simultaneously experience an increase in the percentage of inflation in 2022. Where, Japan will increase to 2.5%, China will increase to 2%, Vietnam will increase to 3.2%, Malaysia will increase to 3.4%, Canada increased to 6.8%, Singapore increased to 6.1%, and South Korea increased to 5.1% (World Bank, 2024).

The next factor influencing the volume of Indonesian shrimp exports is the United States dollar exchange rate.The exchange rate or exchange rate is an important factor that influences exports (Dolatti, 2011). A medium of exchange in the form of money is needed in international trade which is called the foreign exchange rate (Suparsa, 2016). The exchange rate or exchange rate is an important indicator that influences the stability of an economy. This research uses the United States dollar exchange rate, because the United States dollar exchange rate is an international standard currency exchange rate whose value is relatively stable and is a strong currency that can be easily traded and can be accepted by anyone as payment for their transactions (Latief, 2001).The following is the development of the United States dollar exchange rate to the main destination countries in the 2018-2022 period in US$ units.

Table 5. Development of the United States Dollar Exchange Rate to Main Destination Countries (US$)

Country	United States Dollar (US$) Exchange Rate				
	2018	2019	2020	2021	2022
Vietnamese	22,602.05	23,050.24	23,208.37	23,159.78	23,271.21
South Korea	1,100.16	1,165.36	1,180.27	1,143.95	1,291.45
Japan	110.42	109.01	106.77	109.75	131.5
China	6.62	6.91	6.9	6.45	6.74
Malaysia	4.04	4.14	4.20	4.14	4.40
Singapore	1.35	1.36	1.38	1.34	1.38
Canada	1.3	1.33	1.34	1.25	1.3

Source: World Bank, 2024

Based on Table 5 above, it can be seen that the exchange rates of Vietnam, South Korea, Japan, China, Malaysia, Singapore and Canada will increase in 2022 against the United States dollar exchange rate. However, in previous years, these

five countries experienced fluctuations, where the exchange rates of the five countries experienced increases and decreases.

When the exchange rate of the main export destination country experiences an appreciation in the value of the currency, it will impact the price of imported products to become cheaper than the price before the appreciation, causing demand for imported goods to be higher (Firdaus, 2018). If the exchange rate of the main destination country for Indonesian shrimp exports experiences an increase (appreciation), that country will import more shrimp, so that the volume of Indonesian shrimp exports to that country will increase.

Based on the condition of Indonesia's export volume to the main destination countries which tends to fluctuate from year to year, this is very important to pay attention to in order to determine the factors that cause increases and decreases in the volume of Indonesian shrimp exports to the main destination countries, so this research tries to look at determinants that influence the volume of Indonesian shrimp exports to the main destination countries, namely Japan, China, Vietnam, Malaysia, Canada, Singapore and South Korea in 2013-2022 with independent variables, including GDP per capita, population, inflation rate and United States dollar exchange rate.

Based on the background and problems described above, it is deemed necessary to carry out related studies"Analysis of Determinants that Influence the Volume of Indonesian Shrimp Exports to Main Destination Countries for the 2013-2022 Period".

RESEARCH METHODS

Research design is the planning of research to be carried out with the aim of conducting research so that there is logic, both in testing hypotheses and in drawing conclusions (Sugiyono, 2016).Based on the problems studied, this research uses an associative quantitative method. This research aims to analyze the influence of GDP per capita, population, inflation rate, and the United States dollar exchange rate on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period.

Data Type

The type of data used in this research is quantitative data. Quantitative data is data in the form of numbers or quantitative figures (Sugiyono, 2016). This research uses quantitative data sourced from the United Nations Comtrade, CEIC Data, and the World Bank which is published annually through the official website.

Method of collecting data

In this research, the data collection method used was the non-participant observation method. Non-participant observation is observation where the

researcher is not directly involved with what is being observed and is only an independent observer (Sugiyono, 2016). This research was conducted using data on the volume of Indonesian shrimp exports, GDP per capita of the main destination country, population of the main destination country, inflation rate of the main destination country, and the United States dollar exchange rate in the 2013-2022 period. Data was obtained by observing and recording as well as studying descriptions in journals, books, theses, and accessing the websites of the Central Statistics Agency, Ministry of Maritime Affairs and Fisheries, United Nations Comtrade, CEIC Data, and World Bank.

Data analysis technique

This research uses a panel data regression model. Panel data regression is a regression that combines time series data with cross section data (Widarjono, 2013). The use of panel data in this research provides several advantages, namely being able to provide more data and by using panel data it can overcome problems that arise if variables are omitted. In the case of using panel data, collinearity between variables is very small, so the possibility of multicollinearity is also very low (Gujarati and Porter, 2012).

Data Analysis Model

The model used in this research method is a panel data regression model. Combining time series and cross section data will be able to solve variable problems. The formula used is as follows:

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + e_{it} + it \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Information :

Y   = Indonesian shrimp export volume in year t

α = Constant

X_1 = Gross Domestic Product per capita in period t

X_2 =Populationin period t

X_3 = Inflation in period t

X_4 =United States dollar exchange ratein period t

B (1…4)   = Regression coefficient of each independent variable

e_{it} =*error*

$_it$ = Panel data

RESULTS AND DISCUSSION

Results of Analysis of Research

Selection of Panel Data Regression Models

The purpose of panel data regression analysis is to determine whether the model used adheres to the Common Effect Model, Fixed Effect Model, and Random

Effect Model. So that the model used is good and appropriate, a Chow and Hausman test is needed as follows.

a. Test Chow

The Chow test is carried out to test whether the model used adheres to the Common Effect Model or the Fixed Effect Model. Test results are shown in Table 6.

Table 6. Chow Test Results

Effect Test	Statistics	df	Prob.
Cross-section F	219.988104	(6.59)	0.0000
Chi-square cross-section	220.606727	6	0.0000

The chow test is a test carried out to choose a good approach between the Fixed Effect Model (FEM) and the Common Effect Model (CEM) (Ghazali and Ratmono, 2013).Based on the data processing results above, it can be seen that the resulting output is 0.0000 and smaller than 0.05, so the model used is the Fixed Effect Model (FEM). Because the model chosen was FEM, it was continued with the Hausman Test.

b. Hausman test

The Hausman test is carried out to test whether the model used adheres to the Fixed Effect Model (FEM) or the Random Effect Model (REM). Test results are shown in Table 7.

Table 7. Hausman Test Results

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Random cross-section	30.362768	4	0.0000

The Hausman test is a technique that aims to determine whether the model used is a Fixed Effect Model (FEM) or a Random Effect Model (REM) (Ghazali and Ratmono, 2013).Based on the data processing results above, it can be seen that the resulting output is 0.0000 and smaller than 0.05, so the model used is the Fixed Effect Model (FEM). Because the model chosen was FEM, it was completed and not continued with the Lagrange Multiplier test. Thus, the best model chosen is the Fixed Effect Model (FEM). The following results of selecting the best model can be seen in Table 8 below.

Table 8. Selection of the Best Panel Data Regression Model

Test/Results	Test Chow	Hausman test
Results	Prob < 0.05 = 0.0000	Prob < 0.05 = 0.0000

Based on the table above, it can be seen that in panel data regression testing in the Chow test the F-statistic probability value is smaller than the real level of five

percent (0.000 < 0.05), so in the Chow test, the Fixed Effect Model (FEM) is selected. Furthermore, in the Hausman test, the F-statistic is smaller than the five percent real level (0.000 < 0.05), so in the Hausman test, the Fixed Effect Model (FEM) is selected. Based on these results, because the Fixed Effect Model (FEM) was chosen, there was no need to continue with the Lagrange Multiplier test, because the Lagrange Multiplier test was carried out to test the Common Effect Model (CEM) and Random Effect Model (REM).

Classic assumption test

After determining the appropriate model to use in the panel data regression equation, the appropriate model is the Fixed Effect Model (FEM). Panel data makes it possible to study more complex behavior in the model so that panel data testing does not require classical assumption tests (Gujarati, 2012). However, according to Basuki and Prawoto (2016), the classical assumption tests used in linear regression with the Ordinary Least Squared (OLS) approach include Linearity, Autocorrelation, Heteroscedasticity, Multicollinearity and Normality tests. However, not all classical assumption tests must be carried out on every model. linear regression with the OLS approach.

1. Linearity tests are almost not carried out on every linear regression model because it is assumed that the model is linear. If you have to do it, just to see how far the level of linearity is.
2. The normality test is basically not a BLUE (Best Linear Unbias Estimator) requirement and some opinions do not require this requirement to be something that must be met.
3. Autocorrelation only occurs in time series data. Autocorrelation testing on data that is not time series (*cross section* or panel) will be wasted.
4. Multicollinearity needs to be carried out when linear regression uses more than one independent variable. If there is only one independent variable, then multicollinearity cannot occur.
5. Heteroscedasticity usually occurs in cross section data, where panel data is closer to the characteristics of cross section data than time series.

From the explanation above, it can be concluded that in panel data regression, not all classical assumption tests in the OLS method are used, only multicollinearity and heteroscedasticity are needed (Basuki and Prawoto, 2016).

A. Multicollinearity Test

Multicollinearity is a condition where one or more independent variables can be expressed as a linear combination of other independent variables. Multicollinearity appears if the independent variables have a high correlation. To test the multicollinearity problem, you can look at the correlation matrix of the independent variables. If there is a correlation coefficient of more than 0.90, then

there is multicollinearity (Gujarati, 2012). The results of the multicollinearity test can be seen in Table 9 below.

Table 9. Multicollinearity Test Results

	X1	X2	X3	X4
X1	1.000000	-0.405880	-0.207596	-0.500940
X2	-0.405880	1.000000	0.035412	-0.144027
X3	-0.207596	0.034512	1.000000	0.342860
X4	-0.500940	-0.144027	0.342860	1.000000

Based on the table above, it can be seen that there is no correlation coefficient more than 0.90. All independent variables in the multicollinearity test results in the table above show that there is no independent variable whose value exceeds 0.90. This means that in this research there were no multicollinearity problems.

B. Heteroscedasticity Test

The Heteroscedasticity Test aims to test whether in a regression model there is an inequality of variance from the residuals of one observation to another observation. If the variance from the residual from one observation to another observation is constant, it is called homoscedasticity and if it is different it is called heteroscedasticity. If the sig value ≤ 0.05 means there is heteroscedasticity. Meanwhile, if the sig value ≥ 0.05 means there is no heteroscedasticity. The results of the heteroscedasticity test can be seen in Table 10 below.

Table 10. Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	2.202595	*Prob. F(4.65)*	0.0784
Obs*R-squared	8.355553	*Prob. Chi-Square(4)*	0.0794
Scaled explained SS	11.18443	*Prob. Chi-Square(4)*	0.0246

The heteroscedasticity test in the research was carried out using the Breusch-Pagan-Godfrey test. In this study, based on the results of the heteroscedasticity test that was carried out, it was found that the chi square probability value was greater than the real level of five percent (0.0794 > 0.05), this shows that the estimation model does not contain symptoms of heteroscedasticity.

Hypothesis testing

The hypothesis test in this research consists of three, namely statistical tests (F test), partial tests (T test), and coefficient of determination test (R^2) with the following results:

A. F Test (Simultaneous Test)

The F test is used to test whether the regression model used can be used to predict the influence of independent variables on the dependent variable together (Ghozali and Imam, 2016). In this study, the F-statistical test was used to determine whether the independent variables (GDP per capita, population, inflation rate, and US dollar exchange rate) had a simultaneous effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period. The results of the F test in this study can be seen in Table 11 below.

Table 11. F Test Results (Simultaneous Test)

F Test Results (Simultaneous Test)	
R-square	0.960252
Adjusted R-square	0.953515
F-statistic	142.5347
Prob (F-statistic)	0.000000

Based on the results of the F test (Simultaneous Test), it can be seen that the probability value of the F-statistic is smaller than the real level of five percent (0.000000 < 0.05), so that the variables GDP per capita (X1), population (X2), level inflation (X3), and the US dollar exchange rate (X4) together (simultaneously) influence the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period (Y).

B. T Test (Partial Test)

The T test (partial test) basically aims to see how much influence an individual independent variable has on the dependent variable. The T test (Partial Test) in this study is used to determine whether the coefficients of each independent variable are GDP per capita (X1), population (X2), inflation rate (X3), and US dollar exchange rate (X4) partially (individually). has a significant influence on the dependent variable of Indonesian shrimp export volume to the main destination countries for the 2013-2022 period. The results of the T test (Partial Test) in this study can be seen in Table 12 below.

Table 12. T Test Results (Partial Test)

Variables	Coefficient	Std. Error	t-Statistics	Prob
C	-31477.90	9086,399	-3.464288	0.0010
X1	0.010627	0.063380	0.167668	0.8674
X2	0.181805	0.037548	4.841968	0.0000
X3	43.16439	181.0174	0.238454	0.8124
X4	-2.568100	0.726329	-3.535726	0.0008

Based on the table above, it can be seen that the regression equation obtained is as follows:

Y= -31477.90 + 0.010627X1 + 0.181805X2 + 43.16439X3 −2.568100X4 + e…..(4.1)

If you look at the significance value per variable based on the probability value T (p-value), then the independent variables that have a partially significant effect on the dependent variable above are the population variable (X2), GDP per capita (X1) has a positive but not significant effect, level inflation (X3) has a positive but not significant effect, and the US dollar exchange rate (X4) has a negative but significant effect. The probability value of the GDP per capita variable (X1) is 0.8674 > 0.05, the population variable (X2) is 0.0000 < 0.05, the inflation rate variable is 0.8124 > 0.05, and the dollar exchange rate variable AS (X4) is 0.0008 < 0.05.

Based on these results, it shows that the population variable (X2) and the US dollar exchange rate variable (X4) have a partially significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period. The variables GDP per capita (X1) and inflation rate (X3) do not have a partially significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period because the T probability value (p-value) is higher than the five percent significance level.

C. Coefficient of Determination (R2)

The coefficient of determination (R^2) essentially measures how far the model's ability is to explain variations in the dependent variable. Where the coefficient of determination value is between zero and one ($0 \le R2 \le 1$). A small R2 value means that the ability of the independent variables to explain dependent variations is limited. A value close to one means that the independent variables provide almost all the information needed to predict variations in the dependent variable. The following are the test results to see how big the Adjusted R-square value is in this research.

Table 13. Coefficient of Determination Test Results (R2)

Coefficient of Determination Test Results (R2)	
R-square	0.960252
Adjusted R-square	0.953515
F-statistic	142.5347
Prob (F-statistic)	0.000000

Based on the table above, the Adjusted R-square value is 0.953515. This value shows that the variables GDP per capita (X1), population (X2), inflation rate (X3), and US dollar exchange rate (X4) as a whole are able to explain the dependent

variable of the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period. of 95.35%.

Discussion of Research Results

The Influence of GDP Per Capita (X1) on the Volume of Indonesian Shrimp Exports to Main Destination Countries (Y)

Based on Table 12, the variable GDP per capita (X1) for importing countries has a probability value of 0.8674 > 0.05 and a t value of 0.167668 <ttable1.6955 so it can be concluded that H0 is accepted and H1 is rejected, meaning that GDP per capita (X1) of the importing country has a positive but not significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period (Y). The regression coefficient for the GDP per capita variable (X1) is 0.010627, which means that assuming other variables are constant, an increase of 1 US$ in GDP per capita in importing countries will increase 0.010627 in the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period.

This is supported by previous research conducted by Siburian (2012) which stated that the GDP of export destination countries had a positive effect on Indonesian exports. Every increase in the GDP of the export destination country will increase Indonesia's exports. Apart from that, according to Raihanisyah (2017), the GDP per capita of the importing country has a positive effect on increasing Indonesia's natural rubber exports. Furthermore, research from Xi Wan and Kazmi (2022) states that GDP per capita has a positive influence on export volume.

Based on the results of these data tests, of course this is in accordance with the hypothesis in this research, where the GDP per capita of the destination country for Indonesian shrimp exports has a positive effect on the volume of Indonesian shrimp exports to the main destination countries but is not very significant. So it can be said that an increase in the average income of the population of a country is able to reflect the purchasing power of the destination country for shrimp commodities imported from other countries. If the GDP per capita of the export destination country is high it will result in an increase in the volume of shrimp to be exported, but this not significant, which means that the average income of the population in the export destination country can provide an increase in the volume of Indonesian shrimp exports to that country, but the increase that will be obtained is not significant.

Influence of Population (X2) on the Volume of Indonesian Shrimp Exports to Main Destination Countries (Y)

Based on Table 12, the population variable (X2) has a probability value of 0.0000 < 0.05 and a tcount value of 4.841968 >ttable1.6955 so it can be concluded that H0 is rejected and H1 is accepted, meaning that the population of the importing country (X2) has a positive and significant effect on the volume of Indonesian shrimp exports to the main destination countries for the period 2013-2022 (Y). The regression coefficient for the population population variable (X2) is 0.181805, which means that assuming other variables are constant, an increase of 1 million in the population of importing countries will increase 0.181805 in the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period.

The results of this research are supported by previous research conducted by Maulana and Kartiasih (2017) which stated that population has a strong and positive relationship with the quantity of commodities consumed. This shows that an increase in the population of a country will increase the number of commodities purchased. A large population reflects a country's large market potential. Apart from that, research by Marhaeni (2022) states that population has a positive and significant effect on the value of Indonesian footwear exports to the United States. This means that if the population growth of the country where Indonesian shrimp is exported increases, that country will import more shrimp. Meanwhile, research from Amadeo and Maria (2023) states that population has a positive and statistically significant influence on high technology exports, both in absolute terms and in terms of employment.

Based on the results of the data above, this is of course in accordance with the hypothesis in this research where the population of the country of destination for Indonesian shrimp exports has a positive and significant effect on the volume of Indonesian shrimp exports to the main destination countries. So it can be said that the population is able to reflect the purchasing power of the destination country for shrimp commodities imported from other countries. If the population of the export destination country is high it will result in an increase in the volume of shrimp to be exported. This is because population has a significant influence on the volume of Indonesian shrimp exports. This means that the increase in population in export destination countries greatly influences the volume of shrimp exports to that country.

Effect of Inflation Rate (X3) on the Volume of Indonesian Shrimp Exports to Main Destination Countries (Y)

Based on Table 12, the inflation rate variable (X3) has a probability value of 0.8124 > 0.05 and a tcount value of 0.238454 <ttable1.6955 so it can be concluded that H0 is accepted and H1 is rejected, meaning that the inflation rate of the importing country (X3) has a positive but not significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period (Y). The regression coefficient for the inflation rate variable (X3) is 43.16439, which means that assuming other variables are constant, a 1 percent increase in the inflation rate (X3) will increase 43.16439 in the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period.

The results of this research are supported by theory, namely in the theory of Sukirno (2011)Inflation causes the price of imported goods to become cheaper than domestically produced goods.The results of this research are also supported by previous research conducted by Pratiwi (2018) which stated that inflation had a positive but not significant effect on exports. Meanwhile, research according to Naptania and Mia (2022) states that inflation has a positive but not significant effect on export volume in five ASEAN countries.

Based on the above, according to Sukirno's (2008) theory, inflation causes the price of imported goods to become cheaper than domestically produced goods, meaning that if domestic consumption increases, the volume of Indonesian shrimp exports will increase because the price of imported goods becomes cheaper than goods produced domestically. It can be concluded that, based on the results of data processing, inflation has a positive but not significant effect, meaning that an increase in inflation in export destination countries can result in an increase in the volume of shrimp exports to that country, but the increase that will be obtained is not very significant or can be said to have little effect on the increase. volume of shrimp exports to destination countries.

The Effect of the US Dollar Exchange Rate (X4) on the Volume of Indonesian Shrimp Exports to Main Destination Countries (Y)

Based on table 12, the US dollar exchange rate variable (X4) has a probability value of 0.0008 < 0.05 and a tcount value of -3.535726 >ttable1.6955 so it can be concluded that H0 is rejected and H1 is accepted, meaning that the US dollar exchange rate (X4) has a negative and significant effect on the volume of Indonesian shrimp exports to the main destination countries for the period 2013-2022 (Y). The regression coefficient for the US dollar exchange rate variable (X4) is -2.568100, which means that assuming other variables are constant, an increase of 1 US$ in the exchange rate of the importing country will not necessarily reduce the

volume of Indonesian shrimp exports by 2.568100 to the main destination country for the 2013-2022 period. .

The results of this research are supported by research by Alvaro (2019) which states that the exchange rate has a negative effect on Indonesian copper exports. Then, research by Deva and Bagus (2015) stated that the exchange rate had a negative and significant effect on Indonesia's net fuel oil exports. Apart from that, research by Bruno and Shin (2015) states that the dollar exchange rate has a negative effect on export volume. When the US dollar strengthens by 1%, average exports fall by 2%.

The exchange rate of the destination country has a negative but significant effect on the volume of Indonesian shrimp exports to the main destination country. So, it can be said that if there is a depreciation in the value of the currency, the volume of Indonesian shrimp exports will decrease because demand decreases due to a decrease in the currency exchange rate, and this has a significant effect. It can be concluded that, based on the results of data processing, the dollar exchange rate has a negative and significant effect, meaning that an increase in the dollar exchange rate in export destination countries can result in a decrease in the volume of shrimp exports to that country and the decrease that will be obtained is significant or can be said to have an effect on a decrease in the volume of shrimp exports to country of destination.

CONCLUSION

Based on the results of the analysis presented in the previous chapter, several conclusions can be drawn to answer the problem formulation as follows.

1) Gross Domestic Product (GDP) per capita, population, inflation rate and US dollar exchange rate simultaneously influence the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period.

2) Population population (X_2) partially has a positive and significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period. Gross Domestic Product (GDP) per capita (X_1) and inflation rate (X_3) partially have a positive but not significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period. The US dollar exchange rate (X_4) partially has a negative and significant effect on the volume of Indonesian shrimp exports to the main destination countries for the 2013-2022 period.

BIBLIOGRAPHY

Agus, BIK, & Trunajaya, IG (2013). Analysis of Economic Scale in the Brick Industry in Tulikup Village, Gianyar, Bali. Journal of Applied Quantitative Economics, 6(1).

Agus, W. (2015). Econometrics: Introduction and applications, Econosia. Jakarta.

Akbar, DA (2012). Causality of Inflation, Interest Rates, and Money Supply: A Case of Indonesian Economy. STIE MDP Scientific Journal. 2 (1)

Alexander HI (1993). Guide to Effective Cash Flow Management. Jakarta: PT. Elex Media Komputindo.

Alvaro, R. (2019). The Effect of Exchange Rate, Inflation, and GDP on Copper Exports in Indonesia.

Amadeo, N. & Maria, A. (2023). Determinants of High-tech Exports: New Evidence from OECD Countries. Journal of National Library Medicine. USA.

Budget of the National Assembly of South Korea. (2024). Low Birth Rate. South Korea

Anggaristyadi. (2011). Analysis of the Influence of Per Capita Income, Rupiah Exchange Rate against the Dollar, Foreign Exchange Reserves, and Inflation on the Development of Indonesian Imports in 1985-2008. Journal: Development Economics. Sebelas Maret University.

Astuti, I., & Ayuningtyas. (2018). The Influence of Exports and Imports on Economic Growth in Indonesia. Journal of Economics and Development Studies, 19(1).

Central Bureau of Statistics. (2013). Indonesian Shrimp Exports. November. BPS. Jakarta.

Central Bureau of Statistics. (2023). Oil and Gas-Non Oil and Gas Export Value. March. BPS. Jakarta

Central Bureau of Statistics. (2023). Canada's Surge in Immigrants and Temporary Residents. January. BPS. Jakarta

Vietnam Statistics Agency. (2023). The Third Most Populous Country in Southeast Asia. January. BPS. Vietnamese.

Ball, D. A, et al. (2005). International Business; Challenges of Global Competition.. Jakarta: Salemba Empat.

Bank Indonesia. (2020). Indonesian inflation. January. BI. Jakarta.

Baskara, et al. (2019). The Influence of Profitability, Leverage, and Liquidity on Company Value in the Food and Beverages Sub Sector. Management E-Journal.

Basuki, AT & Prawoto, N. (2016). Regression Analysis in Economics and Business Research. Rajawali Press, Jakarta.

Batubara, DMH (2015) Analysis of the Relationship between Exports, Imports, GDP and Indonesia's Foreign Debt for the Period 1970-2013. Journal of Applied Quantitative Economics, 8(1).

National Bureau of Statistics of China. (2024). China's Productive Age Generation. January. BSNC. China.

Bruno, V. & Shin, S. (2015). Dollars and Exports. Journal of American Universities

Bustami, BR (2013). Analysis of the Competitiveness of Export Products of North Sumatra Province. Journal of Economics and Finance. 1(2).

CEIC Data (2023). Population of Japan, China, Vietnam, Malaysia, Canada, Singapore, South Korea. November. Jakarta.

Department of Statistics Malaysia. (2023). Popular Migration Destinations. Malaysia.

Prasetyo, A. (2004). Analysis of Tiger Shrimp Catch Results on Shrimp Trawl Fishing Equipment based on Time Differences in Arafura waters. Journal of Fisher Resources Utilization Management and Technology.pe 3 (2).

Pratama, T. (2008). Macroeconomic Theory: An Introduction. Jakarta: FE UI Publishing Institute

Prathama R. (2010). Microeconomic Theory. Yogyakarta: Gadjah Mada University.

Pratiwi, AA (2018). Analysis of the Effect of the US Dollar Exchange Rate, GDP and Inflation on Indonesian Exports in 2006.I-2016.IV. Muhammadiyah Surakarta university.

Pridayanti, A. (2014). The Influence of Exports, Imports and Exchange Rates on Economic Growth in Indonesia for the 2002-2012 period. Journal of Economic Education. 2(2). pp. 10-20.

Purwaningsih, S. (1995). Shrimp Freezing Technology. PT. Self-help distributor. Jakarta.

Raihanisyah. (2017). Analysis of the determinants and competitiveness of Indonesian natural rubber exports in the world market. Indonesian Journal of Agricultural Economics.

Roza, E. (2017). Indonesian Maritime, Extraordinary Luxury. Jakarta. Ministry of Maritime Affairs and Fisheries of the Republic of Indonesia.

Rukini. (2014). ARIMAX Model and GARCH Detection for Denpasar City Inflation Forecasting in 2014. Journal of Applied Quantitative Economics, 7(2).

Said, R. (2012). Introduction to Population Science. Jakarta: Institute for Economic and Social Research and Development.

Salvatore, D. (2014). International Economics. Jakarta: Salemba Empat.

Samuelson. (1999). Macroeconomics. Jakarta: PT. Education Global Media

Selien, D. S. & Gert, P. (2012). The US Dollar Exchange Rate and the Demand for Oil. Journal Economic research Foundation Flanders, Vol 2(4).

Setiawan, HLS (2011). International trade. Yogyakarta: Nusantara Library.

Siburian, O. (2012). Analysis of factors influencing Indonesian natural rubber exports to Singapore 1980-2010. EDAJ Journal (2)

Silvia AKM, & Bendesa, IKG (2015). Comparative Advantages of Indonesian Footwear Products to ASEAN Countries. Journal of Applied Quantitative Economics. 1(1).