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ANALYSIS OF THE EFFECT OF THE DOLLAR EXCHANGE RATE, INFLATION AND PRODUCTION ON TUNA PRODUCTION IN NORTH SUMATRA

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***Abstract*:** This study aims to determine the effect of the Dollar Exchange Rate, Inflation and Production on Tuna Fish Production in North Sumatra. The research method used in this research is associative method. This method aims to determine the relationship between two or more variables and the type of data used is quantitative. The data used is secondary data or time series from 2014 to 2023 sourced from the Statistics center and Bank Indonesia. The analysis method in this research is multiple linear regression method. The results of multiple linear regression show the results of this study that the dollar exchange rate has a negative and significant effect on tuna exports in North Sumatra. Inflation has a positive and significant effect on tuna exports in North Sumatra. Production has a negative and significant effect on tuna exports in North Sumatra. Based on the results of the F test the dollar exchange rate, inflation and production simultaneously have a significant effect on the export variable. The coefficient of determination test results show that there is a very close relationship between the dollar exchange rate, inflation and production on tuna fish exports in North Sumatra with a value (R-Square) of 0.905 or 90.5%. This result means that the magnitude of the influence of the dollar exchange rate, inflation and production on tuna fish exports in North Sumatra is 90.5% while the remaining 9.5% is influenced by factors not examined in this study.

***Keywords*:** *Dollar Exchange Rate, Inflation, Production and Exports*

INTRODUCTION

Indonesia is known as an archipelagic country with enormous marine potential. One of the leading commodities from Indonesia's fisheries sector is tuna. Tuna has high economic value and is one of the main commodities in Indonesia's marine exports. North Sumatra Province is one of the regions that contributes significantly to tuna production and exports. With its strategic location near the Malacca Strait, North Sumatra has broad access to international markets.

High inflation rates can increase domestic production costs, thereby affecting the selling price of products in the international market. On the other hand, tuna production in North Sumatra also depends on environmental factors, fishing technology, and infrastructure support. High and sustainable production can ensure supply for export needs. This research is important to understand how the dollar exchange rate, inflation, and production affect the performance of tuna exports in North Sumatra Province. This analysis is expected to provide insights for local governments and business actors in formulating policies that support export stability.

Tuna exports from North Sumatra Province face various challenges influenced by global and domestic economic fluctuations. One of the main problems is the instability of the dollar exchange rate. Data shows that the dollar exchange rate against the rupiah often experiences sharp fluctuations, which could potentially affect the price competitiveness

of tuna in the international market. In addition, the inflation rate in Indonesia, especially in North Sumatra, is also an issue that needs to be considered. High inflation can increase operational costs such as fuel for fishing vessels, workers' wages, and logistics costs. This can reduce the profit margins of fisheries businesses and hamper export growth. From the production side, the sustainability of tuna stocks is a major concern.

LITERATURE REVIEW

A. Exports

According to the Ministry of Customs and Excise, exports are activities involving the removal of goods from customs areas in accordance with customs laws. According to another definition, exports are the sale of goods and services from within the country to other countries (Mankiw, 2016). Meanwhile, according to Priadi (2020), export activities are a trading system carried out by sending goods from within the country to foreign countries based on applicable regulations. From an expenditure perspective, exports are also an important component of aggregate expenditure, which is influenced by the level of national income to be achieved, and is therefore closely related to Gross Domestic Product (GDP).

Theoretically, a country exports when domestic production exceeds domestic consumption, so that producers have the opportunity to market their goods abroad. Factors that influence the export of a good from the supply side are: first, the relative price domestically compared to the price abroad. Second, the exchange rate of the domestic currency against foreign currencies. Third, domestic consumption. Fourth, trade policy (Kusumastuti, 2016).

B. Dollar Exchange Rate

The dollar exchange rate, or dollar exchange rate, is the price of one unit of the United States dollar (USD) expressed in another country's currency, such as the rupiah in Indonesia. According to Sukirno (2015), the exchange rate is one of the most important prices in an open economy because of its significant influence on the current account balance and other macroeconomic variables.

According to Adiningsih (2019), the rupiah exchange rate is the price of the rupiah against other currencies. Fluctuations in the dollar exchange rate can affect the competitiveness of export products, import costs, inflation, and overall economic stability.

C. Inflation

Inflation is one of the issues that can disrupt the economic stability of a country, including Indonesia. This country has faced several inflation crises that have nearly led to national economic bankruptcy.

According to Purnomo (2018), inflation is defined as follows: "Inflation is a situation where the economy of a country experiences a long-term upward trend in the prices of goods and services. This is caused by an imbalance between the flow of money and goods, and this increase is temporary. Inflation occurs when the amount of money in circulation is greater than what is needed."

According to Widjajanta and Widyaningsih (2017), inflation is defined as follows: "Inflation is a process of continuous increase in general prices. The purchasing power of the people decreases because their real income also decreases."

D. Production

According to Mulyani & Herawati (2016), production is an activity to create or add value to a good or service. The production function shows the relationship between production factors and the level of production output, so that if a company wants to produce a higher output, it must use more inputs. Production factors include capital, labor, and technology.

According to Sukirno (2015), production is an activity carried out by humans to produce a product, whether goods or services, which is then utilized by consumers.

RESEARCH METHOD

Types and Sources of Data

The data used in this study is secondary data on an annual basis. The secondary data was obtained from the national and regional Statistics Indonesia (BPS) in North Sumatra, OJK.go.id, Bank Indonesia, and other publications related to this study.

Data Collection Techniques

Data collection techniques are methods used by researchers to reveal or gather quantitative information in accordance with the scope of the research. The data collection techniques used in this study are as follows:

- *Library Research*
- *Internet ResearchTeknik Analisis Data*

A. Classical Assumption Test

1. Data Normality Test
   According to Ghozali (2015), the normality test aims to test whether in the model, the disturbance variable or residual has a normal distribution.
2. Multicollinearity Test
   According to Ghozali (2015), this test aims to examine whether there is correlation between independent variables in the regression model. A good regression model should not have correlation between independent variables. If independent variables are correlated, then these variables are not orthogonal. Orthogonal variables are independent variables whose correlation values with other independent variables are zero.
3. Heteroscedasticity Test
   According to Ghozali (2015), the heteroscedasticity test is to test whether there is a difference in the variance of the residuals from one observation to another in the regression model. If the variance of the residuals from one observation to another is constant, it is called homoscedasticity, and if the variance is different, it is called heteroscedasticity. A good regression model is one that is homoscedastic or does not exhibit heteroscedasticity.
4. Autocorrelation Test
   According to Ghozali (2015), the autocorrelation test aims to test whether there is a correlation between the disturbance error in period t and the disturbance error in period t-1 (previous) in the linear regression model. A good regression model is one that is free from autocorrelation.

B. Hypothesis Testing

According to Ghozali (2015), the accuracy of the sample regression function in estimating actual values can be assessed by its goodness of fit. Statistically, this can be measured at least from the coefficient of determination (R2), the F statistic value, and the t statistic value. Statistical calculations are considered statistically significant if the statistical value is within the critical region (the region where Ho is rejected), and conversely, they are considered insignificant if the statistical value is within the region where Ho is accepted.

RESULTS AND DISCUSSION

RESULTS

1. Classical Assumption Test

a. Normality Test

Table 1. Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		10
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2167.15021389
Most Extreme Differences	Absolute	.202
	Positive	.112
	Negative	-.202
Test Statistic		.202
Asymp. Sig. (2-tailed)		.200[c,d]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

b. Multicollinearity Test

Table 2. Multicollinearity Test

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	15.337	18.063		8.491	.000		
	Kurs_Dollar	-7.249	1.208	-.805	-6.000	.001	.587	1.705
	Inflasi	2.325	.480	.533	4.841	.003	.869	1.151
	Produksi	-.011	.004	-.330	-2.550	.043	.630	1.588
a. Dependent Variable: Ekspor								

c. Autocorrelation Test

Table 3. Autocorrelation Test

Runs Test	
	Unstandardized Residual
Test Value[a]	328.70357
Cases < Test Value	5
Cases >= Test Value	5
Total Cases	10
Number of Runs	7
Z	.335
Asymp. Sig. (2-tailed)	.737
a. Median	

d. Heteroscedasticity Test

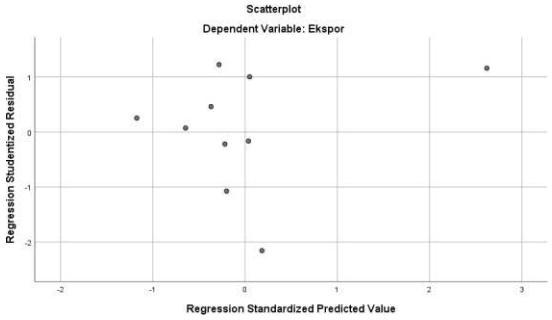

Figure 1. Heteroscedasticity Test

2. Hypothesis Testing

a. Partial Test (t-test)

Table 4. Partial Test (t-test)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.337	18.063		8.491	.000
	Kurs_Dollar	-7.249	1.208	-.805	-6.000	.001
	Inflasi	2.325	.480	.533	4.841	.003
	Produksi	-.011	.004	-.330	-2.550	.043
a. Dependent Variable: Ekspor						

b. Simultaneous Test (F Test)

Table 5. F Test

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62347.376	3	2078.459	29.603	.001[b]
	Residual	4212.724	6	702.621		
	Total	66559.100	9			
a. Dependent Variable: Ekspor						
b. Predictors: (Constant), Produksi, Inflasi, Kurs_Dollar						

CONCLUSIONS AND SUGGESTIONS

CONCLUSIONS

Based on the problem formulation and the results of the tests that have been carried out, the following conclusions can be drawn:

1. The dollar exchange rate has a negative and significant effect on tuna production in North Sumatra.
2. Inflation has a positive and significant effect on tuna production in North Sumatra.
3. Production has a negative and significant effect on tuna production in North Sumatra.
4. These results also show that the dollar exchange rate, inflation, and production have a positive and significant effect on tuna exports in North Sumatra.

SUGGESTIONS

Based on the findings of the above study, the following recommendations can be made:

1. With regard to the dollar exchange rate variable, it is recommended that the government and business actors take advantage of favorable fluctuations in the dollar exchange rate by strengthening the competitiveness of tuna products in the international market. One step that can be taken is to ensure that product quality meets export standards, so that selling prices remain competitive even if the dollar exchange rate changes.
2. Regarding the inflation variable, it is recommended that production costs be influenced by efficient management through technological innovation and operational cost control to reduce its negative impact. The government also needs to create stable economic policies to maintain purchasing power and stabilize raw material prices for tuna producers.
3. Regarding the production variable, it is recommended that increasing production capacity be a top priority. Government support in the form of technical training for fishermen, the provision of modern fishing facilities, and sustainable marine resource management can ensure the availability of raw materials to meet increasing export demand.

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