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ELASTICITY DEMAND OF SKIPJACK TUNA PRODUCTS (*Katsuwonus Pelamis*) AT THE NIZAM ZACHMAN OCEAN FISHERY PORT, MUARA BARU, NORTH JAKARTA CITY

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ABSTRACT

This study aims to determine how much the elasticity of demand and analyze the factors that influence the demand for skipjack tuna products at The Nizam Zachman Ocean Fishery Port, Muara Baru, North Jakarta City. This research was conducted in February 2019 to November 2019. The method used is a quantitative descriptive method using primary data and secondary data. Data analysis techniques used were demand elasticity, multiple linear regression analysis, correlation analysis, simultaneous test (t-test), partial test (f-test), and classical assumption test. The parameters tested were the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice, and DKI Jakarta's per capita income. The results showed that the demand for skipjack tuna in the Nizam Zachman Ocean Fishery Port with the price of skipjack tuna is inelastic, while the results of cross elasticity show that scad fish, big eye tuna and rice are substitute goods, and based on income elasticity, skipjack tuna is a primary item. The demand for skipjack tuna The Nizam Zachman Ocean Fishery Port, Muara Baru, North Jakarta City is simultaneously (jointly) influenced by several factors including the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice and DKI Jakarta's per capita income. Meanwhile, the partial demand for skipjack tuna is influenced by among others the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of rice, and the income per capita of DKI Jakarta. The dependent variable demand for skipjack tuna and the free variable is the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice and the income per capita of DKI Jakarta has a very strong relationship with a correlation value of 0.998.

Keywords: ***Demand Elasticity, Skipjack tuna, Substitutes Goods***

INTRODUCTION

Indonesia is a maritime country that has a large potential of fisheries and marine resources. According to the Food and Agriculture Organization (FAO), Indonesia becomes the second-largest country in fishery catching production, it is 6 million tons in 2014. Fish resources that live in Indonesian waters have a high level of biodiversity. The potential value of fish resources in MSY (Maximum Sustainable Production) in Indonesia in 2017 reached 12.54 million tons (KKP 2018). This potential refers to Indonesia as a country that receives large marine resources including the greatest marine and non-biological marine resources.

The using of Indonesian sea waters is needed as a port as a supporting. Fishery port as a center of fisheries economic development has a very important role in utilizing fishery resources, one of them is in marketing the fishery catches are expected to be more optimal. Based on the Minister of Maritime Affairs and Fisheries Regulation No. PER.08 / MEN / 2012 about Fisheries Port, Nizam Zachman Ocean Fishery Port is the type A port and the largest in Indonesia, where marketing activities are oriented to meet international and national and local market demands. Marketing at Nizam Zachman Ocean Fishery Port will take place at the Modern Fish Market (MFM).

The fish species that dominated the Nizam Zachman Ocean Fishery Port in 2013 were skipjack tuna (Katsuwonus pelamis), it was 32.69%. Based on these data, the measurement to determine the size of the change in the volume of demand for skipjack tuna in the Nizam Zachman Port as a result of the factors that influence the use of the elasticity's concept. According to Mankiw et al. (2012) elasticity is an indicator that measures how responsive the amount of demand or supply changes to one of the determining factors.

The purpose of this study is to know the elasticity of demand for skipjack tuna. By knowing the elasticity of demand for skipjack tuna in Nizam Zachman Ocean Fishery Port, it can be found out the characteristic of the buyers on the price of skipjack tuna and the influence of various factors on demand for skipjack tuna.

RESEARCH METHOD

The research method used in this study is a quantitative method with a descriptive approach design. Quantitative research methods can be interpreted as research methods based on positivism philosophy, used to examine specific populations or samples, sampling techniques are generally collected out randomly, the collecting of data that is using research instruments, quantitative or statistical data analysis in order to test the hypothesis that has been set. A descriptive approach is a problem set regarding the question of the existence of an independent variable, whether it is only on one or more variables (a single variable).

The data used consists of primary data and secondary data. Primary data were obtained directly in the form of questionnaires or interviews with relevant parties and documentation. Secondary data were obtained from existing sources. Secondary data were used includes the form of time series data five years back, they were the years of 2009-2018 that were obtained from the Ocean Fisheries Port Office of Nizam Zachman, and the Central Statistics Agency (BPS) of DKI Jakarta Province.

Analysis of the data used in this study is the analysis of demand elasticity, further explanation of the formula of demand elasticity, as follows:

1) Demand Elasticity

a. Price Elasticity

The price elasticity can be determined using the following formula:

$$\text{Eh} = \frac{\%\Delta Qx}{\%\Delta Px} \longrightarrow \text{Eh} = -\frac{\Delta Qx}{\Delta Px}\frac{P}{Qx}$$

Notes :

Eh : The elasticity of demand price

Px : The price of goods X

ΔQx : The changing number of demanded goods X

ΔPx : The changing of price goods X

b. Income Elasticity

The income elasticity can be determined using the following formula:

$$\text{Ep} = \frac{\%\Delta Qx}{\%\Delta I} \longrightarrow \text{Ep} = \frac{\Delta Qx}{\Delta I}\frac{I}{Qx}$$

Notes :
Ep : The elasticity of income
I : The consumer's income
Qx : The number of demanded goods X
ΔQx : The changing number of demanded goods X
ΔI : The change of consumer's income

c. Cross Elasticity

The cross elasticity can be determined using the following formula:

$$\text{Es} = \frac{\%\Delta Qx}{\%\Delta Py} \rightarrow \text{Es} = \frac{\Delta Qx}{\Delta Py}\frac{Py}{Qx}$$

Keterangan :
Es : Cross elasticity
Py : Price goods Y
Qx : The number of goods X
ΔQx : The changing number of demanded goods X
Δpy : The change in goods Y's price

2) Multiple Linear Regression

The data analysis technique used in this study is the using of multiple linear analysis by using the formula:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + e$$

Notes :
y : The demand for skipjack tuna (Kg)
α : Constant
β : Coefficient
X_1 : The price of skipjack tuna (IDR)
X_2 : The price of scad fish (IDR)
X_3 : The price of bigeye tuna (IDR)
X_4 : The price of squid (IDR)
X_5 : The price of rice (IDR)
X_6 : Income per capita (IDR)
e : error

3) Classical Assumption Test

Classical Assumption Test is an analysis conducted to assess whether in an Ordinary Least Square (OLS) linear regression model there are classic assumption problems. The classic assumption tests used in this study include the following.

a. Normality Test

The purpose of testing the normality assumption is to test whether, in a regression model, the independent and dependent variables have a normal or near-normal distribution. This test uses the normal P-P of Regression Standardized Residual chart approach. The basis for decision making is that if the data spreads around a diagonal line and follows a diagonal line, it meets the assumption of normality.

b. Multicollinearity Test

Symptoms of multicollinearity are the symptoms of correlation between independent variables. Multicollinearity can be detected in the regression model if the independent variables are strongly correlated with each variable.

c. Heteroscedasticity Test

To detect the existence or absence of heteroscedasticity, if the variance from the residue of one observation to another observation is fixed, then it is called homoscedasticity and if different is called heteroscedasticity (Ghozali 2016). The basis for decision making for the heteroscedasticity test using the Park Gleyser test is that if the independent variable is statistically significant influencing the dependent variable, then there is an influence which is indicated to heteroscedasticity happens. On the contrary, if the independent variable does not significantly affect the dependent variable, heteroscedasticity does not happen.

4) Simultaneous Test (F-test)

The F test was used to determine the effect of all the independent variables together on the variation of the dependent variable (the amount of skipjack tuna demand) with a trust level of 95%. The calculated F formula is:

$$\text{F counting} = \frac{R^2/(k-1)}{(1-R^2)/(N-k)}$$

Notes :
R2 : Determination Coefficient
N : The number of observation
k : The number of variables

5) Partial Test (T-test)

T-test was used to determine the effect of each independent variable on the variation of the dependent variable, it is the number of demand for skipjack tuna at a significant level particular (α), it is α = 5%.

The calculated T formula is:

$$\text{T counting} = \frac{\beta i}{Se(\beta i)}$$

Notes :
T counting: The value of T statistic
βi : The regression coefficient of the i independent variable
Se (βi) : Standard error coefficient I independent variable regression

RESULT AND DISCUSSION

Geographical location and condition of The Nizam Zachman Ocean Fishery Port, Muara Baru, North Jakarta City

The Nizam Zachman Ocean Fishery Port is a fishery activity center located in Muara Baru (Jakarta Bay), Penjaringan Village, Penjaringan District, North Jakarta which is geographically located at 06005'-06007' LS dan 106050'-106050' BT (PIPP 2015). Administratively Nizam Zachman Ocean Fishery Port is bordering with:

a) Northside is bordered by the Java Sea Coast
b) Southside is bordered by Pejagalan Kelurahan, Penjaringan District and Gunung Sahari Utara railroad
c) West of Pejagalan Kelurahan, Penjaringan Subdistrict, and Pluit Kelurahan, Penjaringan Subdistrict
d) The East is bordered by Ancol Village

The Nizam Zachman Ocean Fishery Port is a type-A port that has an area of 110 ha. The land use in the Nizam Zachman Ocean Fishery Port is 39 ha in the area of the aquatic land and 71 ha in the land area, and has a pier along 2,118.5 m (the western part is 1,326.5 m and in the east is 775 m) and the jetty is 350. The Nizam Zachman Ocean Fishery Port is also equipped with 71 ha of land consisting of 41 ha of industrial estate and 30 ha of public services.

Facilities and services at the Nizam Zachman Ocean Fisheries Port Jakarta in supporting operational infrastructure are including the basic facilities, functional facilities, and supporting facilities. Functional facilities are facilities that function to enhance the use-value of basic facilities by providing the services needed at the Fishery Port, one of the functional facilities at the Nizam Zachman Ocean Fisheries Port, it is a fish trading transaction place or Modern Fish Market (PIM) which is another function at the port as a central business related to the marketing of the manufacturing and trading industries.

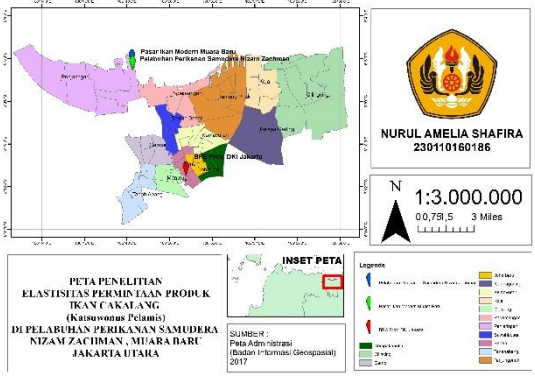

Figure 1. Location Map

Modern Fish Market in The Nizam Zachman Ocean Fishery Port is a fish market that has been renovated and inaugurated on March 13th, 2019. Muara Baru Modern Fish Market is a name that has been changed, where previously it was the Fish Marketing Center with the same main function, it is the wholesale fish market center. Modern Fish Market development resembles the Tsukiji Market in Tokyo, Japan, with the concept of a hygienic and clean fish market that aims as a tourist destination for the marine and fisheries sector. PIM was built on a land of around 4.15 ha consisting of 3 floors with a building area of around 2 ha. Facilities at Modern Fish Market Muara Baru include 896 wet fish stalls, 155 maritime kiosks, 8 units of food court, 30 ton capacity cilling room, 20 ton IFM (Ice Flake Machine) capacity, unloading loading area, packing room, styrofoam crushing room, Wastewater Treatment Plant, and supporting facilities in the form of management room, meeting room, banking and mosque.

Data Descriptive (Market Absorption)

Demand is the entire relationship between the price of goods and the demand for goods. The volume of production of superior commodities landed at the Nizam Zachman Ocean Fishery Port, illustrates the demand for these commodities in the Modern Fish Market. The production volume of skipjack tuna and other leading commodities in Nizam Zachman Ocean Fishery Port is illustrated in Figure 2 as follows:

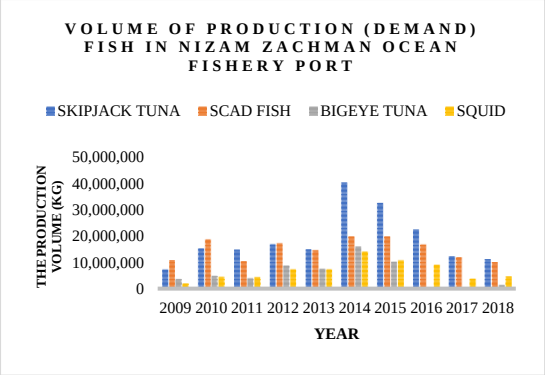

Figure 2. Chart of Development the Volume Commodity Production that is Landed at the Nizam Zachman Ocean Fishery Port Year 2009-2018

The volume of commodity production landed at the Nizam Zachman Ocean Fishery Port has a fluctuating development or shows a variable or fluctuating change in a variable. According to an interview with the manager of the Nizam Zachman Ocean Fishery Port, the development of this fluctuating volume of production was caused by several factors including the procurement of fish that affected the season, the way fish were spread, and how they were caught. According to Aristiantin, et al. (2017) skipjack tuna catching landed at Nizam Zachman Ocean Fishery Port has increased quite dramatically over the past 10 years. The increase is due to the number of a fishing boat (fishing trips) which are also increasing every year.

According to an interview with the manager of Nizam Zachman Ocean Fishery Port, the production volume of a commodity landed at Ocean Fishery Port will determine the sale value or the selling price of the commodity. The development of skipjack tuna prices and other leading commodities is illustrated in Figure 3 as follows.

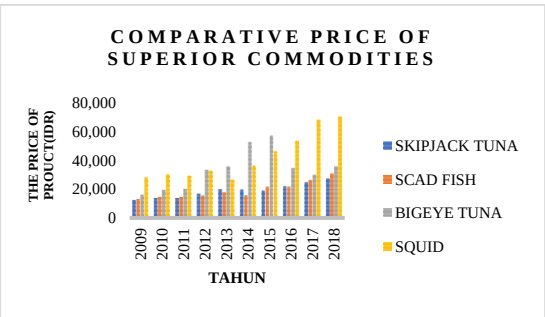

Figure 3. Graph of Comparison of Competitive Prices of Commodities in Modern Fish Market

Based on the graph in Figure 3 it can be seen the comparative development or comparison of superior commodity prices in the Modern Fish Market of Nizam Zachman with the highest trend, it is squid commodity, and the lowest trend is the price of skipjack tuna. Although the skipjack tuna has the most dominant production volume and production value, based on price, skipjack tuna has a price or value that is quite low or cheap. Based on interviews with fish traders, the reason that skipjack tuna have low prices is the amount of stock of fish that are experiencing oversupply compared to other commodities. Meanwhile, the cause of the price of squid has an increased price is also due to the squid is difficult to procure so the amount of stock is small. A detailed description of the development of skipjack tuna prices for 10 years (2009-2018) in Table 1.

Table 1. Development of Skipjack Tuna Prices in the Modern Fish Market Years of 2009-2018

Year	The Price of Jackfish (IDR/Kg)
2009	12.500
2010	13.666
2011	13.700
2012	16.649
2013	19.701
2014	19.456
2015	18.915
2016	21.803
2017	24.609
2018	27.366
Average	18.837

The price of skipjack tuna in this study is the data of skipjack tuna prices that are recapitulated per year in kilograms, by the Nizam Zachman Ocean Fishery Port during 2009-2018, at the Modern Fish Market or Fish Marketing Center. The average price of skipjack tuna during 2009-2018 was IDR 18,837.00 with the highest price, it is in 2018 amounting to IDR 27,366.00, the lowest price in 2009 of IDR 12,500.00, and the price with the last recapitulation in 2018 is IDR 27,366.00. Based on these data, the price of skipjack tuna has a level of development with an upward trend of 10 years, except in 2014 and 2015 experienced a price decline to IDR 19,456.00 and IDR 18,915.00. The factor that caused the decline in prices, allegedly because the production volume of skipjack tuna (Figure

15) in 2014 experienced a quite drastic increase with the highest number during 2009-2018, causing an oversupply of skipjack tuna, as well as factors influencing the quality of fish and weight size fish. According to Hanafiah and Saefuddin (2006) in Febrianti, et al (2013), high-quality fishery products will provide high prices, whereas fish with low quality, the price will be low too. Similarly, for the size of weight. The heavier the size of the fish the more expensive or higher the price of fish and vice versa.

Demand Elasticity for Skipjack Tuna

Elasticity is an indicator that measures how responsive the amount of demand or supply changes to one of the determining factors (Mankiw et al. 2012). The degree of sensitivity of the demand function to price changes can be determined by looking at each of the independent variables. The results of the elasticity of skipjack tuna demand analysis at the Modern Fish Market in Table 2.

Table 2. Value of Elasticity Demand of Skipjack Tuna in Modern Fish Market

	Elasticity Value		
Variable	Price	Cross	Income
The Price of Skipjack Tuna	-(0,47)		
The Price of Scad Fish		0,416	
The Price of Bigeye Tuna		0,465	
The Price of Squid		0,375	
The Price of Rice		0,568	
Income per Capita			0,776

The elasticity of the request can be explained as follows:

a. The Price Elasticity

Based on the results of the analysis note the amount of elasticity of -0.47. The value of the negative elasticity indicates that the price of skipjack tuna has an inverse relationship with the demand for skipjack tuna. This shows that if the price of skipjack tuna goes up 1%, the demand for skipjack tuna will go down by 0.47%, and vice versa if the price of skipjack tuna goes down by 1%, the demand for skipjack tuna will go up by 0.47%. Negative signs only explain the inverse relationship between the price of goods and the number of requests (Sukirno 2016). A price elasticity value of less than one indicates that the demand for skipjack tuna is inelastic, meaning that the percentage change in the demand for skipjack tuna is smaller than the change in the price of skipjack tuna.

b. Cross Elasticity

Cross elasticity of the demand for skipjack tuna includes the price of scad fish, the price of bigeye tuna, the price of squid, and the price of rice. The elasticity value of the price of scad fish is 0.416. This shows that if the price of scad fish rises 1%, the demand for skipjack tuna will increase by 0.416%, and vice versa. While the results of the cross elasticity analysis of the price of bigeye tuna are 0.465. This means that if the price of bigeye tuna rises 1%, the demand for skipjack tuna will increase by 0.4652%, and vice versa. The amount of cross elasticity of squid is 0.375. This shows that if the price of squid rises by 1%, the demand for skipjack tuna will increase by 0.375%, and vice versa. And the result of the cross elasticity of rice prices is 0.568. This shows that if the price of rice rises by 1%, the demand for skipjack tuna will increase by 0.568%, and vice versa.

The results of the elasticity value of the free variable price of scad fish, price of scad fish, the price of bigeye tuna, and the price of rice get results with a positive sign. Based on the interpretation of the elasticity of cross demand according to Kunawangsih and Antyo (2015), if Es> 0 (positive), these results indicate that the scad fish, bigeye tuna, and squid are substitutes or substitute commodities from skipjack tuna. The results indicate that between food items are complementary in line with the results of research conducted by Ferdian, et al (2012) that the cross elasticity between the price of catfish with the price of other freshwater fish, and the price of sea fish is a substitute commodity or interchangeable item.

c. Income Elasticity

The result of income elasticity analysis shows that the amount is 0.775, which means that if there is an increase in income of 1%, it will result in an increase in the demand for skipjack tuna by 0.775%, and vice versa. Based on the interpretation of income demand elasticity according to Kunawangsih and Antyo (2015), the income elasticity figure of 0.776 indicates that Ep> 0 or skipjack tuna is a primary, meaning that if the population's income rises the demand for skipjack tuna will increase. The coefficient value is less than one, explaining that the demand for skipjack tuna

has a smaller proportion than the proportion of the increase in income.

Table 2 shows that the elasticity of demand for skipjack tuna, based on price elasticity, cross elasticity, and income elasticity, results are inelastic. According to Rasyid (2015), however, fish products (as generally food products) have relatively inelastic demand. The taste factor and the increasing number of consumers (market area) largely determine the demand for fish and fish products. In the opinion of Wahyuni, et al (2016) the inelastic nature of the demand for foodstuffs of vegetable protein sources can be understood because it is an important or essential product to meet consumer needs, so that price changes are not overly responded to consumers by reducing or increasing the amount requested significantly.

The elasticity of demand shows that skipjack tuna is a primary item. The demand and price of skipjack tuna is not too closely related to the price of bigeye tuna, and squid shown by the elasticity value of each commodity is smaller than the elasticity value of skipjack tuna, but the value of elasticity at the price of rice and income is greater than value elasticity of skipjack tuna prices. So that the skipjack tuna in the Modern Fish Market is quite responsive to changes in economic determinants

Factors That Affect Demand for Skipjack Tuna

Multiple Linear Regression Analysis

The results of data analysis using SPSS 22 obtained the results of multiple linear regression equations as follows:

$$\mathbf{Y = -7655777 + 714.377X_1 + 41.937X_2 + 348.686X_3 - 55.758X_4 + -1548.341X_5 + 0.012X_6}$$

Where:

Y = The Demand of Skipjack Tuna
X1 = The Price of Skipjack Tuna
X2 = The Price of Scad Fish
X3 = The Price of Bigeye Tuna
X4 = The Price of Squid
X5 = The Price of Rice
X6 = Income per Capita

Based on the results of the regression equation above, formulating the relationship between the demand for skipjack tuna and the factors that influence it are the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice and the income per capita used multiple linear regression. The regression equation above can be explained as follows:

a) A constant value of -765577 can be interpreted that the independent variable is the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice, and income per capita if the value is 0 or constant, then the demand for skipjack tuna will be amounting to -765577. The constant value of -765577 based on the results of multiple regression analysis, has a negative sign which means it has a negative effect. Negative constant means a decrease in the demand for skipjack tuna by -765577.

b) Regression coefficient X_i (the price of skipjack tuna) is 714,377 and has a positive value meaning, it shows a direct relationship between the influence of the price of skipjack tuna on the demand for skipjack tuna is positive and quite strong. If the price of skipjack tuna rises by one unit (rupiah), it will increase demand for skipjack tuna by 714,377, assuming other variables are constant or constant.

c) Regression coefficient X_2 (the price of skipjack tuna) is 714,377 and has a positive value meaning it shows a direct relationship between the influence of the price of skipjack tuna on the demand for skipjack tuna is positive and quite strong. If the price of skipjack tuna rises by one unit (rupiah), it will increase demand for skipjack tuna by 714,377, assuming other variables are constant or constant.

d) Regression coefficient X_3 (the price of bigeye tuna) is 348,686 and has a positive value meaning it shows a direct relationship with the influence of the price of bigeye tuna to the demand for skipjack tuna is positive and quite strong. If the price of bigeye

tuna rises by one unit (rupiah), it will increase the demand for skipjack tuna by 348,686, assuming other variables are constant or constant.

e) Regression coefficient X_4 (squid price) of -55.758 and a negative value means that it shows the direction of the relationship which is inversely proportional between the price of squid with demand for skipjack tuna. If the price of squid rises by one unit (rupiah), it will reduce the demand for skipjack tuna by -55,758, assuming other variables are constant or constant.

f) Regression coefficient X_4 (rice price) of -1548,341 and a negative value means that it shows the direction of the relationship which is inversely proportional between the price of rice and tuna demand. If the price of rice rises by one unit (rupiah), it will reduce the demand for skipjack tuna by -55,758, assuming other variables are constant or constant.

g) Regression coefficient X_6 (DKI Jakarta per capita income) of 0.012 and a positive value means that it shows a direct relationship with the influence of DKI Jakarta per capita income on demand for skipjack tuna is positive and quite strong. If DKI Jakarta's per capita income rises by one unit (rupiah), it will increase the demand for skipjack tuna by 0.012, assuming other variables are constant or stable.

Classic assumption test

a. Normality Test

The normality test results in Figure 4 and Figure 5 are as follows:

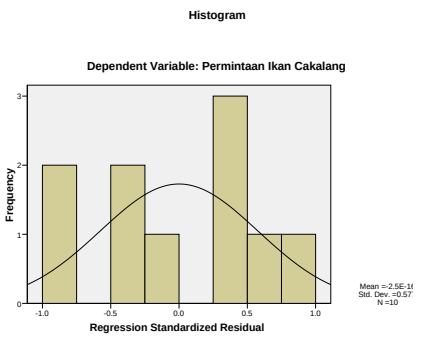

Figure 4. Histogram

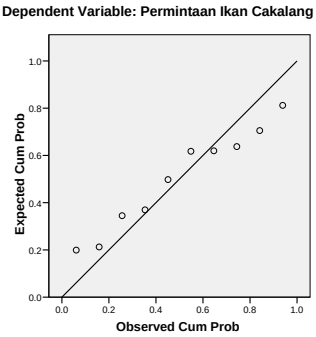

Figure 5. *Normal P-P Plot*

Based on the results of the histogram graph the data spread around the diagonal line and follows the direction of the diagonal line or the histogram graph, the hat shows the normal distribution pattern so that the regression model meets the normality assumption. This is supported by the results on the normal p-plot graph, the results show that the data spread around the diagonal line and follows the direction of the diagonal line, which means the regression model meets the normality assumption.

b. Multicollinearity Test

The multicollinearity test results in Table 3 are as follows :

Table 3. Value of Multicollinearity Test

Variable	Collinearity Statistics		Notes
	Tolerance	VIF	
The Price of Skipjack Tuna	0,171	5,846	There is no multicollinearity
The Price of Scad Fish	0,814	1,228	There is no multicollinearity
The Price of Bigeye Tuna	0,132	7,564	There is no multicollinearity
The Price of Squid	0,304	3,289	There is no multicollinearity
The Price of Rice	0,113	8,866	There is no multicollinearity
Income per Capita	0,334	2,990	There is no multicollinearity

Source: Secondary Data Analysis Results

Multiple regression models using VIF (Variance Inflation Factor). has the following conditions:

i. there is no multicollinearity

ii. VIF > 10, there is multicollinearity

Looking at the results in Table 3, the results of the calculation of the value of VIF (Variance Inflation Factor) show that there is no VIF value of more than 10 of the independent variables, the VIF value of each independent variable is worth the price of skipjack tuna by 5.486, the price of scad fish by 1,228, the price of bigeye tuna is 7,546, squid price is 3,289, rice price is 8,866, and income per capita is 2,990. The VIF value of the six independent variables can be concluded that there is no multicollinearity or strong relationship between the independent variables in the regression model. If there is a high correlation between the independent variables, then the relationship between the independent variable and the dependent variable is disturbed.

c. Heteroscedasticity Test

The heteroscedasticity test results in Table 4 are as follows:

Table 4. Value of Heteroscedasticity Test

Variable	Koef. Correlation	P-value	Notes
The Price of Skipjack Tuna	0,497	0,144	There is no heteroscedasticity
The Scad Fish	0,176	0,627	There is no heteroscedasticity
The Bigeye tuna	0,624	0,054	There is no heteroscedasticity
The Price of Squid	0,018	0,960	There is no heteroscedasticity
The Price of Rice	0,479	0,162	There is no heteroscedasticity
Income Per Capita	0,433	0,211	There is no heteroscedasticity

Source: Secondary Data Analysis Results

In Table 4 the results of heteroscedasticity testing show that the p-value or the significance of the six independent variables is greater or> 0.05. The p-value of each independent variable is the price of skipjack tuna by 0.144, the price of scad fish by 0.627, the price of bigeye tuna by 0.054, the price of squid by 0.960, the price of rice by 0.162, and the income per capita by 0.211. Heteroscedasticity test results can be concluded that the six tests have no heteroscedasticity problems or the inequality of variation from residuals or error values from one observation to another in the regression model.

Correlation Analysis

The correlation value is used to determine the degree of relationship and contribution of independent variables to the dependent variable. The results of the correlation test analysis of the value of r = 0.998 means that the value is close to 1, then the correlation between all independent variables (the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice, and per capita income) is said to be positive and very strong. The relationship between all independent variables (the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice, and the per capita income) is directly proportional to the dependent variable (demand for skipjack tuna).

Simultaneous Test (F-Test)

The simultaneous test results (F-test) in Table 5 are as follows:

Table 5. Value of F-Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	9443406925 19712,000	6	15739011541 9952,000	143,788	,001 (a)
Residual	3283785274 152,630	3	10945950913 84,210		
Total	9476244777 93864,000	9			

Source: Secondary Data Analysis Results

Based on Table 5, it can be seen that the significance value of 0.001 and smaller than $\alpha = 0.05$, when using the F table, a value of 3.374 is obtained so that the calculated F value is greater than the F table, with a value of 143.788. Thus, H0 is rejected and H1 is accepted, which means that the independent variables (the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice and income per capita) studied together have a significant effect on the variable bound (demand for skipjack tuna) in the Modern Fish Market of , Nizam Zachman Ocean Fishery Port at a 95% trust level.

Partial Testing (T-Test)

The partial test results (T-test) in Table 6 are as follows:

Table 6. Value of T-Test

Variable	Regression Coefficient	Error Standart	T Counting	Significance
The Price of Skipjack Tuna	714,377	106,988	6,677	0,007
The Price of Scad Fish	41,937	9,716	4,316	0,023
The Price of Big Eye Fish	348,686	66,752	5,224	0,014
The Price of Squid	-55,758	38,397	-1,452	0,242
The Price of Rice	-1548,341	473,863	-3,267	0,047
Income per Capita	0,012	0,002	5,539	0,012

Source: Secondary Data Analysis Results

The t-test table above shows the significant value of the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of rice, and income per capita is smaller than $\alpha = 0.05$, except for the price of squid which has a value greater than $\alpha = 0.05$. So it can be concluded that H0 is rejected and H1 is accepted, which means that the independent variables include the significance of the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of rice, and income per capita (except for the price of squid) partially influencing the demand for skipjack tuna at the Modern Fish Market, Nizam Zachman Ocean Fishery Port in DKI Jakarta.

CONCLUSION

Based on research conducted on the elasticity of demand for skipjack tuna products (*Katsuwonus pelamis*), it can be concluded as follows:

1. The elasticity of demand for skipjack tuna is inelastic with independent variables, it is the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice, and income per capita. The value of skipjack tuna price elasticity is -0.47 or inelastic. While in cross elasticity, the value of the price elasticity of scad fish is 0.416, the elasticity value of the price of bigeye tuna is 0.465, the value of the squid price elasticity is 0.375 and the price elasticity of rice is 0.568, all three are inelastic. The value of income elasticity is 0.776 which is inelastic.
2. Factors that influence the demand for skipjack tuna simultaneously are the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice and the per capita income of DKI Jakarta. While the factors that partially affect the demand for skipjack tuna are the price of skipjack tuna, the price of scad fish, the price of bigeye tuna, the price of squid, the price of rice and the per capita income of DKI Jakarta.

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