



## DETERMINANT ANALYSIS OF MARINE FISHERMEN'S INCOME IN DENPASAR CITY

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### Abstract:

*According to data from BPS Bali Province, Denpasar City's fishing production value is high, coming in at Rp943,607,030. Fishermen's income, however, is lower than that of farmers and artisans because it is based on the capital and operating expenses for each voyage. If supported by a relatively appropriate physical and financial infrastructure, processing of fish products will increase. In this study, the effects of capital, fishing experience, ship ownership status, working hours, and fish capture on marine fishermen's income were examined. Using the SPSS program, perform a multiple linear regression analysis on the data. With a sample size of 91 respondents, secondary and primary data were employed. The findings demonstrated that a number of factors, including money, fishing experience, ship ownership status, working hours, and fishing itself, have an impact on the revenue of marine fishermen in Denpasar City. While boat ownership status and working hours partially do not have a major impact on the income of marine fisherman in Denpasar City, capital, fishing experience, and fish catches do have a big impact.*

**Keywords:** *Capital, Fishing Experience, Ship Ownership Status, Working time, Fish catch.*

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### INTRODUCTION

Most of Indonesia's territory consists of water, making it a maritime country (Ayu et al., 2013). With a land area of 2,001,648.97 km<sup>2</sup> and a sea area of 96,079.15 km<sup>2</sup>, Indonesia constitutes 76% of the total area of Indonesia. Because of Indonesia's vast territorial sea, some of its citizens make a living as fishermen. The fisheries sub-sector contributed 431.469 billion to GDP in 2020, according to data from Bank Indonesia. It is known that, in the agricultural sector, fisheries are in third place, under food crops and plantations (Pribadi & Pauleit, 2015). Of course, sales and consumption of fishery products contribute to GDP. A total of 5.89 million tonnes of fishery products were produced in the first quarter of 2022, of which 1.90 million tonnes came from aquaculture and 3.99 million tonnes from capture fisheries. Aquaculture provides IDR 58.60 trillion and capture fisheries IDR 62.06 trillion for the total value of production. The abundance

of fisheries originating from the Island of the Gods or Bali Province has an impact on one of Indonesia's fishery candidates.

One of the provinces in Indonesia, Bali Province, offers fishery potential due to the fertile sea around the island. Different fish resources, populations, fishery processing facilities, and fishery production are the main factors affecting the fishery potential of the Province of Bali. Bali province also has skilled people in the fishing industry, including fishermen and fish cultivators, according to demographic data. There were 17,056 fish cultivators and 23,786 fishermen in 2018. This figure represents 14.2% of all employees in the agriculture, forestry and fisheries industries. 13. 333 fewer people became farmers in 2019 than in 2018 (Putri et al., 2021) Eight certified processing units, the most for the Bali-Nusa Tenggara region, employ skilled employees as processors (Fitriana, 2019)

**Table 1. Fisheries Production Value by District/City in Bali Province**

No	District/City	Fisheries Production Value (Rupiah)		
		Year 2019	Year 2020	Year 2021
1	Jembara Regency	330.626.487	324.063.457	287.703.410
2	Tabanan Regency	96.662.590	99.039.372	100.163.115
3	Badung Regency	160.950.870	196.459.415	171.186.830
4	Gianyar Regency	38.860.840	41.571.751	48.529.355
5	Klungkung Regency	47.308545	102.682.558	263.999.228
6	Bangli Regency	135.360.698	148.744.516	137.101,940
7	Karangasem Regency	580.821.685	663.594.835	648.495.700
8	Buleleng Regency	579.295.683	354.961.970	612.644.108
9	Denpasar City	788.087.935	977.543.947	943.607.030
	Total	2.757.975.331	2.908.661.821	3.213.430.717

Source: BPS Bali Province, 2021

The value of fisheries production in Denpasar City, Bali Province, for the last three years is IDR 943,607,030. Karangasem Regency is in second place with IDR 648,495,700. It is known that the main fishery product of the City of Denpasar is catfish, the yield of which will reach 321.6 tons in 2021 (Source: One Denpasar Data). Through an integrated agricultural system that focuses on product processing and marketing and is supported by generally accepted physical and economic infrastructure, the City of Denpasar also offers a lot of potential for fishery development (Wolfert et al., 2010). Under these circumstances, the marine and fisheries industry has solid development possibilities in terms of boosting the regional economy, increasing trade and employment, and generating foreign currency for the government (Sarker et al., 2018). The sub-district that employs the most fishermen, North Denpasar, has 358 fishermen, and the sub-district that employs the least, West Denpasar, has 97 fishermen. 34,402 tons of fish can be produced in Denpasar City in 2021 (Wang et al., 2021). With a total production of 681 tons in

2021 for marine capture fisheries, swordfish will occupy the top position, followed by grouper with a production of 203 tons.

The number of fish caught greatly affects the welfare of fishermen. According to the argument put forward by Mubyarto, Soetrisna, and Dove in 1984:16, fishing families are often poorer than farming or artisan families. Because the fishing community is very dependent on the owner of capital (tauke / boss), and that they have to pay overhead costs every time they go sailing. The complexity of the difficulties faced by fishermen today has an impact on their struggling businesses. resulting in poverty in coastal areas and among fishermen. Income levels are affected by a number of variables, including capital, fishing skills, boat ownership status, hours worked, and fishing. Fishermen with money will invest in high quality gear and equipment to be used for fishing (Maskanah et al., 2019).

The income of marine fishermen is positively and significantly affected by capital, according to (Maghfira, 2021). According to research by (Dewanti et al., 2015) Experience and training are essential to increase fishermen's income. A person can be more productive by expanding their knowledge and expertise. According to research (Neneng et al., 2016). having many ships will result in varying productivity. When fishermen have more boats, their chances of catching fish and other creatures are higher than when they have only one boat. The production and profitability of marine fishermen are significantly affected by the number of vessels owned, according to the study (Bertheussen & Vassdal, 2019). Morning to noon is the most productive time to be at sea, and it takes an average of about three to four miles and seven to eight hours (Covey, 2020). Fishermen consider this time as an effective time to go to sea outside of regular working hours because they use basic fishing equipment and logistics at Kenjeran Beach (Halim & Susilo, 2013). The welfare level of fishermen is largely based on the catch of fish. The quantity of income received is mostly used for family consumption needs (IM Muntari et al., 2017).

## **METHOD**

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This research is included in the category of quantitative research. The research was conducted in Denpasar City. Non-participant observation, in-depth interviews, and questionnaires were used to collect data. A total of 1,036 fishermen from Denpasar City constituted the study population, and 91 samples were obtained using the Slovin method. By using SPSS software, the authors tested it with multiple linear regression analysis.

## **RESULTS AND DISCUSSION**

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The normality test is used to determine whether the independent and bound variables in the regression model have a normal distribution or not. Asymp Sig. (2-tailed) values for the study findings were achieved at  $0.200 > 0.05$ . Thus, the normality assumption has been satisfied by the test model. Therefore, the data is considered normally distributed.

**Table 2. One-Sample Kolmogorov-Smirnov Tes**

		Unstandardized Residual
N		91
Normal Parameters <sup>ab</sup>	Mean	0,0000000
	Std, Deviation	37045,643610
Most Extreme Differences	Absolute	0.061
	Positive	0.061
	Negative	-0,051
Test Statistic		0,061
Asymp, Sig, (2-tailed) <sup>c</sup>		0,200 <sup>d</sup>

- a. Test distribution is Normal.
- b. Calculated from data
- c. Lilliefors Significane Correction

Source: Processed Data, 2023

To determine whether a regression model identifies correlations between independent variables, a multicollinearity test is used. It can be concluded from the data that there is a low collinearity between the independent variables in this study.

**Table 3. Multicollinearity Test Coefficients<sup>a</sup>**

Type	Unstandardized Coefficients		Standardized Coefficients	t	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
<b>1 (Constant)</b>	442147,217	69559,475		6,356	0,000		
	0,302	0,065	0,232	4,640	0,000	0,665	1,505

<b>Capital</b>	4550,499	2201,328	0,122	2,067	0,042	0,475	2,103
<b>Marine Experience</b>	16224,979	13113,417	0,054	1,237	0,219	0,874	1,144
<b>Ship Status</b>	1282,619	917,990	0,060	1,397	0,166	0,906	1,103
<b>Working Time</b>	22777,528	2206,316	0,655	10,324	0,000	0,411	2,435
<b>Fish yield</b>							

a. Dependent Variable: Marine Fishermen's Income

Source: Processed Data, 2023

Test heteroscedasticity to see if there are residual variance inequalities between observations in the regression model. The statistically significant independent variable does not change the dependent variable, and heteroscedasticity in absolute values does not exist, according to the test results shown below.

**Table 4. Heteroscedasticity Test**

Type	Coefficients <sup>a</sup>			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
1 (Constant)	25369,881	42213,120		0,601	0,549
Capital	0,038	0,039	0,124	0,964	0,338
Marine Experience	-1641,557	1335,906	-0,186	-1,229	0,223
Ship Status	4098,395	7958,057	0,058	0,515	0,608
Working Time	643,998	557,095	0,127	1,156	0,251
Fish yield	-956,561	1338,933	-0,117	-0,714	0,477

a. Dependent Variable: Abs-res

Source: Processed Data, 2023

Structural equations can be made based on the results of multiple linear regression analysis shown in Table 4 below.

$$Y = 442147.217 + 0.302X_1 + 4550.499X_2 + 16224.979X_3 + 1282.619X_4 + 22777.528 X_5 \dots (1)$$

The results show the direction of the influence of the independent variables on the dependent variable. Coefficient Positive regression shows that the effect is consistent with the income of marine fishermen.

**Table 5. Multiple Linear Regression Analysis Test**

Type	Coefficients <sup>a</sup>			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
1 (Constant)	442147,217	69559,475		6,356	0,000
Capital	0,302	0,065	0,232	4,640	0,000

## Determinant Analysis of Marine Fishermen's Income in Denpasar City

Marine Experience	4550,499	2201,328	0,122	2,067	0,042
Ship Status	16224,979	13113,417	0,054	1,237	0,219
Working Time	1282,619	917,990	0,060	10,324	0,166
Fish yield	22777,528	2206,316	0,655		0,000

a. Dependent Variable: Marine Fishermen's Income

*Source: Processed Data, 2023*

The F test or simultaneous test is used to determine the effect of all independent variables on the dependent variable or together. Simultaneous test results with ANOVA are as follows.

**Table 6. F Test Analysis Results**

ANOVA <sup>a</sup>					
Type	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	754510397486,576	5	150902079497,315	103,848	0,000 <sup>b</sup>
Residual	123514173941,994	85	1453107928,729		
Total	878024571428,570	90			

a. Dependent Variable: Marine Fishermen's Income

b. Predictors: (Constant), Fish catch, working time, ship ownership status, capital, experience, going to sea

*Source: Processed Data, 2023*

The significance level is  $0.000 < 0.05$ , so  $H_0$  is rejected and  $H_1$  is allowed because the result is  $F_{\text{calculate}} \text{ value } 103.848 > F_{\text{table}} 2.321$ . This means that the income of marine fishermen in Denpasar City is strongly influenced by a number of factors at once, including capital, fishing experience, boat ownership status, working time, and fish catches.

The effect of capital on the income of marine fishermen in Denpasar City:  $H_0$  rejected and  $H_1$  approved because of value  $t_{\text{count}} 4.640 > t_{\text{table}} 1.6619$  and significance levels of  $0.000 < 0.05$ . This indicates that the income of marine fishermen in Denpasar City is significantly positively influenced by capital variables. A  $\beta_1$  value of 0.302 indicates that the income of marine fishermen (Y) will increase by Rp0.302 if the capital ( $X_1$ ) increases by 1 rupiah and other independent variables are considered constant.

The effect of fishing experience on the income of marine fishermen in Denpasar City:  $H_0$  rejected and  $H_1$  approved because of value  $t_{\text{count}} 2,067 > t_{\text{table}} 1,6619$  and significance levels of  $0.000 < 0.05$ . This indicates that the income of marine fishermen in Denpasar City is significantly positively influenced by the variable of fishing experience. The  $\beta_2$  value of 4550,499 indicates that the income of marine fishermen (Y) will increase by Rp4,550,499 if the experience of fishing ( $X_2$ ) increases by 1 year and other independent variables are considered constant.

The effect of boat ownership status on the income of marine fishermen in Denpasar City:  $H_0$  accepted and  $H_1$  rejected because of value  $t_{\text{count}} 1,237 > t_{\text{table}} 1,6619$  and significance levels of  $0.219 > 0.05$ . This indicates that the income of marine fishermen in Denpasar City is not partially influenced by the variable of boat ownership status. The  $\beta_3$  value of 16224.979 shows that there is a difference in income between fishermen who own their own boat and fishermen who do not have their own boat. Fishermen with their own boats earn a greater income of Rp 16,224,979 than non-owned fishermen.

The effect of working time on the income of marine fishermen in Denpasar City:  $H_0$  accepted and  $H_1$  rejected because of value  $t_{count} 1,397 < t_{table} 1,6619$  and significance levels of  $0.166 > 0.05$ . This indicates that the income of marine fishermen in Denpasar City is not partially affected by working time variables. The  $\beta_4$  value of 1282,619 indicates that the income of marine fishermen (Y) will increase by Rp1,282,619 if the experience of fishing ( $X_4$ ) increases by 1 hour/week and other independent variables are considered constant.

The effect of fish catch on the income of marine fishermen in Denpasar City:  $H_0$  rejected and  $H_1$  approved due to value  $t_{count} 10,324 > t_{table} 1,6619$  and significance levels of  $0.000 < 0.05$ . This indicates that the income of marine fishermen in Denpasar City is significantly positively influenced by fish catch variables. The  $\beta_5$  value of 22777,528 indicates that the income of marine fishermen (Y) will increase by Rp22,777,528 if the fish catch ( $X_5$ ) increases by 1 kg/week and other independent variables are considered constant.

Test the coefficient of determination ( $R^2$ ) to determine how much the independent variable can explain the dependent variable, it is necessary to know the value of the coefficient of determinant (R Square).

**Table 7. Results of Coefficient of Determination Analysis**

Model Summary				
Type	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,927 <sup>a</sup>	0,859	0,851	38119,653

- a. Predictors: (Cconstant), Fish catch, working time, ship ownership status, capital, experience, going to sea
- b. Dependent Variable: Marine Fishermen's Income

*Source: Processed Data, 2023*

According to the findings of the analysis, capital variables, fishing experience, vessel ownership status, working time, and fish catches contributed an average of 85.9% of the variance in the increase or decrease in income of marine fishermen in Denpasar City. While other variables were not included in the equation or the research model used, such as the influence of seasons and weather contributed an average of 14.1%.

## CONCLUSION

Capital, fishing experience, boat ownership status, working time, and fish catches all have a significant positive impact on the income of marine fishermen in Denpasar City. Capital, fishing experience, and partial fish catches have a significant positive impact on the income of marine fishermen in Denpasar City. Ship ownership status and working time do not have a significant effect on the income of marine fishermen in Denpasar City.

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