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## Non-performing loan in fishery sector, Indonesia

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**Abstract.** The fisheries sector's potential is quite large in Indonesia, and during the administration of President Joko Widodo, the demand for fisheries experienced a positive growth trend, which increased 48 percent from 2014 to 2018, from 6,400 thousand tons in 2014 to 9,480 thousand tons in 2018. On the demand side, in addition to domestic demand, the demand for fisheries exports has also increased. Even though there is great potential in output, the absorption of fisheries sector loans is very low, which is only 0.20 percent on average along 2014-2018, and the Non-Performing Loans (NPL) of bank loans in the fisheries sector are quite high. From the data April 2019, the NPL of the fisheries sector was 6.9 percent of the total loans in the sector. This study aims to analyze the factors that affect the NPL in the fisheries sector in Indonesia by using the error correction model (ECM) on the 2010-2019 monthly data, for long and short-term of variables relationship. The empirical model developed to analyze the NPL value of the fisheries are affected by the interest rates, inflation, and output growth of the fisheries sector. This study finds that in the long run NPL is negatively affected by output growth of fisheries sector, and positively affected by inflation and the interest rate of fisheries sector. The cointegration supports the long-term relationship of the dependent and independent variables of the model. The results of the short run model analysis indicate the suitability of the sign with the hypothesis and in line with the results on the long-term model. The results of the long and short-term analysis can be a policy consideration for financial authorities regarding the projection of NPL in the future.

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#### 1. Introduction

The GDP growth rate of the fisheries sector increased from 4.04% (y on y) in 2017 to 5.16% (y on y) in 2018 [1]. This increase is in line with the increase in the amount of fish production, which encourages the development of industries and businesses in the fisheries sector. Previous research shows that the competitiveness of Indonesian fishery products in the international market is quite high [2]. In addition, the study shows that there are differences in the competitiveness of fishery product exports before and after the Joko Widodo's government policy. Increasing the scale of the economy in the fisheries sector, strengthening of the government support through the Financial Services Authority (OJK), also increasingly banking support in fisheries financing, develop the marine and fisheries sector in the country. Fund disbursement policies that prioritize funding in the fisheries sector are implemented with measurable policy directions with due regard to prudence [3].

The Bank provides various types of credit, including productive investment and consumer loans. Productive loans can be used by fishermen as working capital for operational financing, for example, to buy fuel, fish food, or basic needs for fishing vessel crews. Investment credit can be used by fishermen



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to buy boats or fishing equipment or aquaculture activities that can be used in the long term. Although not recommended, lending for fishermen can also be used for consumptive purposes, for example for the purchase of motorcycles, houses, and other consumptive things. In this regard, OJK also encourages banks to develop business plans for lending to the fisheries and marine sector, especially in determining payment periods that are adjusted to the capabilities and business activities of fishermen [4]. The fishermen's economic activities tend to be seasonal, so a financing scheme is needed that is adjusted to the characteristics of the fishermen in the fisheries sector, namely installment payment schemes that are adjusted to the fishermen's business cycle [5].

Table 1. Outstanding Data and NPL of the Maritime and Fisheries Sector

Classification	December 2016			December 2017			December 2018		
	Total Credit (Billion Rupiahs)	NPL (Billion Rupiahs)	NPL Ratio (%)	Total Credit (Billion Rupiahs)	NPL (Billion Rupiahs)	NPL Ratio (%)	Total Credit (Billion Rupiahs)	NPL (Billion Rupiahs)	NPL Ratio (%)
Catch fisheries	4,897	150	3.05	5,403	162	3.00	5,720	124	2.16
Aquaculture	3,777	74	1.96	4,888	83	1.70	5,237	63	1.20
Fisheries	804	18	2.21	982	57	5.83	1,180	34	2.92
Production Facilities Services									
Fishery Processing				8,234	19	0.23	9,086	30	0.34
Industry Fisheries	7,594	147	1.93	8,234	192	2.13	10,908	191	1.75
trade									
Supporting Factors for fisheries	71,184	4590	6.45	73,493	3,539	4.82	73,762	2,496	3.38
Number of Fisheries	95,398	5,039	5.28	101,996	4,050	3.97	105,892	2,939	2.78

Source: OJK [3]

The development of bank credit distribution in the fisheries and marine sector shows an increase. In December 2016, the lending reached 95.398 billion Rupiah, increased to 105.892 billion Rupiah in December 2018. The increase of credit performance is shown by the NPL ratio, which declined from 5.28% in 2016 to 1.78 % in 2018.

The development of financing in the fisheries and marine sector in Indonesia needs attention, because of the potential to experience bad credit. This is because fisheries and maritime businesses are mostly medium and small scale, in addition there are uncertainties in the catch caused by seasonal and natural factors.

Several studies examine the importance of observing a sharp increase in bad credit (NPL). Some studies such as those conducted in Bangladesh and Albania observing macro variables in influencing NPLs, among them is that Gross Domestic Product (GDP) has a negative effect on NPL, while inflation has a significant positive effect on NPL [5][6][7]. In the case of Indonesia, it was revealed that the previous NPL period, GDP growth and inflation rate, had a significant negative effect on NPL [8]. This study examines the influence of GDP in the fisheries sector, inflation and interest rates on the non-performing loan by employing the error correction model (ECM) on the monthly data along 2010-2019.

## 2. Methodology

This study employs an econometric model, namely the two steps Engle-Granger error correction model (ECM). The first step is the formulation of the long-run equation, as follows:

$$NPL_t = \beta_0 + \beta_1 GDP_{ft} + \beta_2 INF_t + \beta_3 R_t + \varepsilon_t \quad (1)$$

$NPL_t$  is the Non Performing Loan in  $t$  period (in percent);  $GDP_{ft}$  is the real fisheries GDP in  $t$  period (in Billion Rupiahs); and  $INF_t$  is the inflation in  $t$  period (in percent), and  $R_t$  is the interest rate on fisheries sector. The  $\beta_0, \beta_1, \beta_2$  and  $\beta_3$  are the parameters, where  $\beta_1, \beta_2 > 0$ ;  $\beta_3 < 0$ , and  $\varepsilon_t$  are the error terms for equation (1) in  $t$  period. The next step of the procedure is to analyze the short-run effects of the non-performing loan (NPL) fisheries sector. Short-run relationship models can be formed with the condition of the error terms of equation (1),  $\varepsilon_t$ , cointegrated [9]. This means that at the independent and dependent variables in the equation (1) are cointegrated, which indicates the existence of long-run relationship of the variables. The EG test was carried out to test the residual cointegration  $\varepsilon_t$ , using the Dicky-Fuller (DF) stationary test [10]:

$$\Delta \varepsilon_t = \Omega_1 \varepsilon_{3t-1} + v_t \quad (2)$$

To estimate the ECM model, equation (1) needs to be re-ordered by adding the first lag of dependent and independent variables, and the model is in the form of autoregressive distributed lag (ARDL) (1,1):

$$NPL_t = b_0 + b_1 GDP_{ft} + b_2 GDP_{ft-1} + b_3 INF_t + b_4 INF_{t-1} + b_5 R_t + b_6 R_{t-1} + \mu NPL_{t-1} + \varepsilon_t \quad (3)$$

and the result is,

$$\Delta NPL_t = b_0 + b_1 \Delta GDP_{ft} + b_3 \Delta INF_t - (1-\mu) (NPL_{t-1} - (b_0 / (1-\mu)) - ((b_1+b_2)/(1-\mu)) GDP_{ft} - ((b_3+b_4)/(1-\mu)) INF_{t-1} - ((b_5+b_6)/(1-\mu)) R_{t-1}) + \varepsilon_t \quad (4)$$

From the ADRL (1,1), it is noted that where  $\beta_6 = \frac{b_0}{1-\mu}$ ,  $\beta_7 = \frac{(b_1+b_2)}{1-\mu}$ ,  $\beta_8 = \frac{(b_3+b_4)}{1-\mu}$ , and  $\beta_9 = \frac{(b_5+b_6)}{1-\mu}$ .

Equation (3) can be referred to a first order model ECM equation with  $(NPL_{t-1} - (b_0 / (1-\mu)) - ((b_1+b_2)/(1-\mu)) GDP_{ft} - ((b_3+b_4)/(1-\mu)) INF_{t-1} - ((b_5+b_6)/(1-\mu)) R_{t-1})$  as an error correction term.

## 3. Result and Discussion

The long-run model estimation results indicate that the GDP of the fisheries sector and inflation have a positive effect on the degree of error of 1 percent of the NPLs in Indonesia. The interest rate variables as hypothesized, have a negative effect on 5 percent degree of error. These results indicate that in the long run, all of the variables in the empirical model individually prove the hypothesis. A further interpretation is that an increase of 1 percent of GDP in the fishery sector has an effect on a decline in NPL in the fisheries sector by 1.14 percent. This can be interpreted that by the increase of output of the fisheries sector will reduce the potency of the default on loans in the sector. The more output of fishery production, the more the ability of fishermen to repay their loans.

The magnitude of the influence of the inflation variable on NPL in the fisheries sector is 0.46 which means that when there is an increase in inflation of 1 percent will affect an increase in bad loans (NPL) by 0.46 percent. Interest rate variables also have a significant effect on NPL in a positive direction. This means that if the interest rates rise by 1 percent, the NPL increases by 0.38 percent. The potential for failure to pay the loans in the fisheries sector increases if interest rates increase. The results of the long-run model estimation are summarized in Table 2.

The estimation results of the long-run model are continued by conducting a cointegration test that supports the long-run relationship of the dependent and independent variables in the model. A cointegrated long-run model is a condition for estimating the short-term model. The results of the Cointegration Test are summarized in Table 3.

Table 2. Estimation Results of the Long-Term NPL Model

Variable	Coefficient	t-Statistic	Prob.	Sig.
LOG(GDPF)	-1.142618	6.497372	0.0000	*
INF	0.465196	4.296023	0.0000	*
R	0.387976	-2.302787	0.0232	**
C	16.96735	7.711964	0.0000	*

Notes: \*) Significant on 1 percent degree of error.  
 \*\*) Significant on 5 percent degree of error.

Table 3. Cointegration Test

Null Hypothesis: RES1 has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.198472	0.0010
Test critical values:		
1% level	-3.490210	
5% level	-2.887665	
10% level	-2.580778	

\*MacKinnon (1996) one-sided p-values.

The estimation results of the short-run model shows that the direction of the independent variable relationship individually is consistent with the long-run model. However, in the short-run, only the inflation variable that significantly affects the NPL of the fisheries sector in Indonesia. Every 1 percent increase in inflation, affects the NPL of the fisheries sector increase by 0.18 percent. The coefficient of ECT in the short-run model negative and significant. This means that the short-run model used is valid or theoretically explain the short-run relationship between the dependent and independent variables. The estimation results of the short-run model are summarized in Table 4.

Table 4. Estimation Results of the Short-Term NPL Model

Variable	Coefficient	t-Statistic	Prob.	Sig.
D(LOG(GDPF))	-0.000514	0.001888	0.9985	-
D(R)	0.544354	-0.951045	0.3437	-
D(INF)	0.182227	2.695996	0.0082	*
RES1(-1)	-0.259949	-2.794853	0.0062	*
C	0.010219	0.119289	0.9053	-

Notes: \*) Significant on 1 percent degree of error.

#### 4. Conclusion

The study results support the hypothesis that the production output variable of the fisheries sector (GDPf) has a negative effect on NPL. Two other variables, namely inflation and interest rates,

<sup>21</sup> have a positive effect on NPL in the fisheries sector. The long-run model estimation shows all of independent variables, namely sectoral interest rate, sectoral inflation, sectoral GDP growth, affect the NPL of the fisheries sector. In the short-run model, only two variables that have significant effect on the NPL, namely sectoral inflation and sectoral GDP growth. The results of the long and short-run analysis in this study can be a policy consideration for financial authorities regarding the projection of NPL in the future.

### Reference

- [1] Statistics Indonesia 2019 *Indonesian Gross Domestic Bruto Quarterly 2015-2019* (Jakarta)
- [2] Oktavilia S, Yusfi R H, Firmansyah and Sugiyanto F X 2018 *IOP Conference Series: Earth and Environmental Science* **116**
- [3] Katadata 2019 *Government Increases KUR Distribution of People's Fisheries in Six Provinces* Katadata
- [4] OJK 2019 Supporting the Banking Industry in Providing Credit / Financing of the Fishery Sector
- [5] Jain P and Moore M 2003 *IDS Work. Pap.* **177** 1–41
- [6] Anjom W and Karim A M 2016 Relationship between Non-Performing Loans and Macroeconomic Factors with Bank Specific Factors: A Case Study on Loan Portfolios – SAARC Countries Perspective Relationship between Non-Performing Loans and Macroeconomic Factors with Bank Specific Factors :
- [7] Turan G and Koskija A 2014 *Acad. J. Interdiscip. Stud.* **3**
- [8] Fajar H and Umanto 2017 *Banks Bank Syst.* **12** 67–74
- [9] R.L. Thomas 1997 *Modern Econometrics an Introduction* (Addison: Wesley Longman)
- [10] Gujarati D N and Porter D C 2009 *Basic Econometrics (5th ed.)*

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