

# Determinants of Non – Performing Loans for MSMEs Financing at Regional Development Banks in Indonesia (Case Study: Bank DKI Jakarta)

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## Abstract

This study aims to analyze the determinants that affect the Non-Performing Loan (NPL) of MSMEs financing which is divided into 11 sectors in DKI Jakarta Bank for the period January 2014 and December 2018. The data used is panel data with a fixed effect regression model. The determinants of a non-performing loan consist of internal factors and external factors. Internal factors consist of ROA, CAR, NPA, BOPO, LDR, NIM, CGC, and CRG; while external factors consist of the BI 7 Days Repo Rate, Inflation, Exchange Rates, and ECG. The results of this study indicate that internal and external factors have different influences on each sector of MSME financing at Bank DKI Jakarta. Overall sector, (i) NPL<sub>1</sub> is influenced by CRG and BI 7 Days Repo Rate; (ii) NPL<sub>2</sub> is affected by ROA, NPA, NIM, CRG, and BI 7 Days Repo Rate; (iii) NPL<sub>3</sub> is influenced by NPA, BOPO, LDR, NIM, CGC, BI 7 Days Repo Rate, Inflation and ECG; (iv) NPL<sub>4</sub> is influenced by CAR, LDR, NIM, CRG, BI 7 Days Repo Rate, and Inflation; (v) NPL<sub>5</sub> is affected by NIM, Exchange Rate and ECG; (vi) NPL<sub>6</sub> is influenced by NIM and Exchange Rate (vii) NPL<sub>7</sub> is influenced by CRG and BI 7 Days Repo Rate (viii) NPL<sub>8</sub> is influenced by NPA, LDR, NIM, BI 7 Days Repo Rate, and inflation (ix) NPL<sub>9</sub> is influenced by BOPO, NIM, CRG, BI 7 Days Repo Rate, and Inflation; (x) NPL<sub>10</sub> is influenced by CGC and CRG; (ix) NPL<sub>11</sub> is influenced by CAR, NPA, NIM, CRG, BI 7 Days Repo Rate, Inflation, and Exchange Rate.

**Keyword:** Non – Performing Loan (NPL), MSMEs, Internal Factor, External Factor, Bank DKI Jakarta

## 1 INTRODUCTION

Banking can provide synergy as a driving force for the economy (Massari, Gianfrate, & Zanetti, 2014). Accelerating the development of the banking sector means accelerating economic growth (Petkovski & Kjo-sevki, 2014). This is because banking has a function as well as its main business, namely extending credit. Not all of the loans were disbursed smoothly, but also experienced defaults or in the banking world it is known as “Non-Performing Loans (NPL). According to Hada et al (2020), NPL is a form of bank failure in managing credit policy.

Many banking analysts refer to NPL as “financial pollution” because it has adverse economic consequences (Barseghyan, 2010; Gonzales - Hermosillo, 1999; Zeng, 2012). Therefore, minimizing the NPL needs to be done to improve the quality of banking. However, any strategy undertaken by banking regulatory authorities in resolving NPL problems requires a comprehensive understanding of the factors first as a basis for making this strategy (Ghosh, 2015).

Many studies have been conducted regarding the factors that affect NPL in banks in various countries, Makri et al (2014) identify factors such as CAP, ROE, DEBT, GDP, unemployment have a significant effect on NPL in banks in the European Union; Ghosh (2015) states that GDP, personal income growth, unemployment rates, housing price indices and homeownership rates have a significant effect on NPLs of banks in the United States; Umar & Sun (2018) stated that GDP, EIR, INFL, FXR, Type of Bank, Bank Risk Taking Behavior, Ownership concentration, Leverage and credit quality have a significant effect on NPL of banks in China; Radivojevid & Jovovic (2017) say that GDP, Inflation Rate, ROA, CAR, lagged NPL have a significant effect on NPL in 25 countries around the world.

The findings of these studies are mixed and have not yet reached a consensus. This means that each bank or country has different characteristics and determinants. Even when entering sub-sectors such as credit financing based on contracts and the economic sector, NPL determinants also differ Hadi et al (2018). Therefore, the authors are interested in conducting research related to NPL determinants specifically and comprehensively on Micro, Small and Medium Enterprises (MSMEs) financing at DKI Jakarta Bank as a regional development bank that has full authority in extending credit in the DKI Jakarta province. There are several reasons why we chose

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and researched Bank DKI Jakarta, including:

First, 99.99 percent of the background of business people in Indonesia is Micro, Small and Medium Enterprises (MSMEs) and contributes 61.1 percent of the national economy (Ministry of Finance, 2020). Meanwhile, DKI Jakarta is the largest province that contributes to the national economy at 17 percent (BPS, 2020). Second, only 63.9 percent of MSME players have access to credit in banks and on the other hand, the quality of credit provided by Bank DKI Jakarta needs to be watched out for because in the second quarter of 2016 it was at the level of 3.45%, an increase from the previous 3.36. % (Bank Indonesia, 2016). Third, the literature on determinants of NPLs in MSMEs financing is still very minimal, even though the MSMEs' contribution to the economy of the country is unquestionable.

The novelty in this study is the first research in Indonesia and even in the world that examines the determinants of Non-Performing Loans (NPL) in MSME financing at Regional Development Banks. Thus, this research can provide both academic and practical significance. Academically, this research is expected to broaden the scientific literature related to the determinants of NPL, especially in the financing of MSMEs at Regional Development Banks in a comprehensive manner. Whereas practically, this research is a source of basic information for bank shareholders in minimizing NPL, especially in the financing of MSMEs.

## 2 LITERATURE REVIEW

### 2.1 Non-Performing Loan

Non Performing Loans (NPL) presented the quality of banking (Ghosh, 2014). This makes bank analysts consider it "financial pollution" (Barseghyan, 2010; Gonzales - Hermosillo, 1999; Zeng, 2012). Therefore, minimizing NPLs needs to be done to improve the quality of banking. Ghosh (2015) states that without knowing the factors that affect the NPL, it is difficult for the decision maker to minimize the NPL.

Many researches on determinants of NPL, such as Makri et al. (2014) in the European Union, use the variables such as CAP, LTD, ROA, ROE, DEBT, Fiscal, GDP, inflation, and unemployment. While Ghosh (2015) uses the predictor variables ROA, Capital to Asset, Loans to Asset, Credit Quality, Disersification, Loan to Deposit, OCA, unemployment rates, homeownership, housing strats, inflation, real loan rate, GDP, personal income growth and GDP per Capita. Specifically, Hadi et al (2018) divided the determinants of NPL into two sub-factors, namely internal factors and external factors.

### 2.2 Internal Factors

Internal factors are factors that come from the banking itself, so the process of minimizing it is under its control. Hadi et al (2018) suggest that internal factors that affect NPL consist of Return on Assets (ROA), Net Income Margin (NIM), Growth Financing, Financing to Deposit Ratio (FDR), Bank Rating (consisting of Good Corporate Governance, Risk Profile, Profitability and Capital) and NPF Management / NPF

Handling.

According to Makri et al (2014) internal factors consist of CAP, LTD, ROA, and ROE. Meanwhile, according to Radivojevid & Jovovic (2017), internal factors consist of ROA, ROE, CAR, LPP, and NIM. Likewise Ghosh (2015) who states that internal factors that affect NPL consist of ROA, Capital to Asset, Loans to Asset, Credit Quality, and Diversification, Loan to Deposit, and OCA.

Based on previous research, and the availability of the data (Bank DKI is still a private bank), in this study researchers used internal factors, namely ROA, CAR, NPA, BOPO, LDR, NIM and CGC.

### 2.3 External Factors

External factors are all forces originating from outside the banking sector which have an influence on banking itself. The process of dealing with external factors is more difficult for banks, because generally their sphere is at the macroeconomic (government) level (Makri et al, 2014; Ghosh, 2015; Radivojevid & Jovovic, 2017; Umar & Sun, 2018).

According to Makri et al (2014), the company's external factors consist of DEBT, Fiscal, GDP, inflation, unemployment. Radivojevid & Jovovic (2017) use the external factor variables to predict NPL such as GDP, unemployment rate, inflation rate, exchange rate, house price index. Likewise Umar & Sun (2018) use GDP, Bank spread (SPRS), effective interest rate (EIR), inflation rate (INFL), and foreign ex-change rate (FXR). Meanwhile, Hadi et al (2018) used the inflation rate factor, Benchmark interest rate / BI 7 Days Repo Rate, GDP, and the USD / IDR Exchange Rate.

External factors used in this study follow Hadi et al (2018) by using external factors consisting of inflation rate, Benchmark interest rate / BI 7 Days Rate Repo, GDP, and USD / IDR exchange rate.

## 3 METHOD

The object of this research is Bank DKI Jakarta, using data obtained from 11 cluster offices in the period January 2014 - December 2018, thus forming 220 observations. Each cluster consists of several branches. Thus, all clusters cover whole of Jakarta province. The data used is panel data obtained from internal and quarterly financial reports of Bank DKI Jakarta. This study uses a fixed effect regression model because the time period is more than the number of research samples (Gujarati, 2015). The data is processed using Eviews 10 software.

The research model based on the previous literature review forms the regression equation model as follows:

$$NPL_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 CAR_{it} + \beta_3 NPA_{it} + \beta_4 BOPO_{it} + \beta_5 LDR_{it} + \beta_6 NIM_{it} + \beta_7 GCG_{it} + \beta_8 CRG_{it} + \beta_9 BIrate_t + \beta_{10} Inflasi_t + \beta_{11} Kurs_t + \beta_{12} ECG_t + \epsilon_{it}$$

Dimana:

$NPL_{it}$  = Non -Performing Loan Sector MSMEs i at time t

$ROA_{it}$  = Return on Asset Bank DKI at time t

$CAR_{it}$  = Capital Adequacy Ratio Bank DKI at time t

$NPA_{it}$  = Non Performing Asset Bank DKI at time t

$BOPO_{it}$  = Ratio of operating expenses to operating income at time t

$LDR_{it}$  = Loan to Deposit Ratio Bank DKI at time t

- $NIM_{it}$  = Net Interest Margin Bank DKI at time t
- $GCG_{it}$  = Good Corporate Governance pada at time t
- $CRG_{it}$  = Credit Growth Bank DKI at time t
- $Birate_t$  = BI 7 day's repo rate at time t
- $Inflasi_t$  = Inflation at time t
- $Kurs_t$  = Exchange rate at time t
- $ECG_t$  = Economic Growth at time t
- $\alpha$  = Constant

Specifically, according to DKI Jakarta's MSMEs Directorate, business sectors in MSMEs is divided into 10 sectors (<https://data.jakarta.go.id>) which will be discussed in this research including:

TABLE 1  
FINANCING OF UMKM BY BUSINESS SECTOR

CODE	BUSINESS SECTOR
1	Aggregate
2	Agriculture, Livestock, Forestry & Fishing
3	Mining and Excavation
4	Processing Industry
5	Electricity, Gas and Clean Water
6	Construction
7	Trade, Hotel and Restaurant
8	Transport and Communication
9	Finance, Real Estate and Corporate Services
10	Services
11	Other Sectors

#### 4 RESULTS & DISCUSSION

The regression results in Table 2 and Table 3 include testing of NPL financing in several MSME sectors showing significant differences in each sector. This is in accordance with research conducted by Hadi et al (2018) which shows differences in influence, depending on the business sector.

The determinants that affect the overall NPL (NPL 1), namely the credit growth factor (CRG) and the BI 7 day's repo rate (BIRATE) have a significant effect on the 5% level. Meanwhile, the Loan to Deposit Ratio (LDR) and inflation have a significant effect on the 10% level.

Factors that affect the agriculture, livestock, forestry & fisheries sector (NPL 2) significantly are Return on Assets (ROA), the ratio of operating costs to operating income (BOPO), Loan to Deposit (LDR), Net Interest Margin (NIM), Good Corporate Governance (GCG), BI 7 day's repo rate (BIRATE).

Likewise with the mining and excavation sector (NPL 3), internal factors that influence include Non-Performing Assets (NPA), Operational Cost Ratio to operating income (BOPO), Loan to Deposit Ratio (LDR), Net Interest Margin (NIM), Good Corporate Governance (GCG); Meanwhile, external influencing factors include the BI 7 Days Repo Rate (BIRATE), inflation and economic growth (ECG).

In the manufacturing sector (NPL 4), internal factors that have significant influence include the Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Net Interest Margin

(NIM), and Credit Growth (CRG); on the other hand, external factors affecting NPL 4 include the BI 7 Days Repo Rate (BIRATE) and inflation.

For the electricity, gas and clean water sector (NPL 5), the influencing factors include internal factors, namely Net Interest Margin (NIM); Meanwhile, external factors affecting NPL 5 include Exchange Rate (KURS) and Economic Growth (ECG).

Furthermore, for the construction sector (NPL 6), the determinants that have an effect include internal factors, namely Net Interest Margin (NIM), which have a significant effect on the 5% level, while for the Non-Performing Asset (NPA) and Loan to Deposit Ratio (LDR) factors have a significant effect against NPL 6 at a significance level of 1%. External factors that has influence include the BI 7 Days Repo Rate (BIRATE) at 1% significance and the Exchange Rate (KURS) at 5% significance.

The NPL of the Trade, Hotel and Restaurant sector (NPL 7) is influenced by determinants including internal factors, namely the Capital Adequacy Ratio (CAR) which has a significant effect at the 1% level and Credit Growth (CRG) has a significant effect at the 5% level. Meanwhile, external factors that affect NPL 7 include the BI 7 Days Repo Rate (BIRATE) which has significant effect on the 5% level and the Inflation significantly affects the 1% level.

The NPL of the transportation and communication sector (NPL 8) is influenced, among others, by the internal factor of Non Performing Asset (NPA), Loan to Deposit Ratio (LDR), Net Interest Margin (NIM) which has a significant effect at the 5% and 1% levels. Meanwhile, external factors affecting NPL 8, including the BI 7 Days Repo Rate (BIRATE) and inflation, has significant effect on the 5% level.

NPL in the financial, real estate and corporate services sector (NPL 9) is influenced by determinants, including internal factors including the Capital Adequacy Ratio (CAR) which has a significant effect at the 1% level; The ratio of operational costs to operating income (BOPO) and credit growth (CRG) has a significant effect on the 5% level and Net Interest Margin (NIM) has a significant effect at the 10% level. Meanwhile, external factors that affect NPL 9 include the BI 7 Days Repo Rate (BIRATE) and inflation significantly at the 5% level; and the exchange rate has a significant effect on the 1% level.

NPL in the services sector (NPL 10) includes influential internal determinants, namely the Capital Adequacy Ratio (CAR) which has significant effect at the 1% level; Good Corporate Governance (GCG) and Credit Growth (CRG) significantly affect at the 5% level. Meanwhile, internal factors that have effect on NPL 10, include BI 7 Days Rate Repo (BIRATE) and inflation, both have significant effect on the 1% level.

Finally, NPL in other sectors (NPL 11), determinants that affect NPL significantly are internal factors such as, Capital Adequacy Ratio (CAR), Non Performing Asset (NPA), and Net Interest Margin (NIM) which significantly affect at the level 10%; Credit Growth (CRG) has a significant effect on the 5% level.; while the ratio of operational costs to operational income (BOPO) and Loan to Deposit Ratio (LDR) have a significant effect on the level of 1%. For external factors that affect NPL 11, BI 7 Days Repo Rate (BIRATE) and inflation have a

significant effect on the level of 10%; while the exchange rate has an effect on the 5% level of significance.

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**TABLE 2**  
**SMEs FINANCING NPL REGRESSION RESULTS IN SECTOR 1 - 6**

	NPL_1		NPL_2		NPL_3		NPL_4		NPL_5		NPL_6	
	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat
Intercept	23.867	-0.5239	99.309 **	2.3406	2.7236	0.9729	95.257	0.2748	7.8054	1.5040	-342.05	-0.7645
ROA	-0.1088	1.5233	-0.0053**	-2.0294	0.0002	1.6431	-0.0132	-0.6140	-0.0004	-1.4967	0.0147	0.5303
CAR	0.6585	0.9362	-0.0067	-1.2265	-0.0005	-1.5919	0.0865 **	1.9264	0.0001	0.2520	0.0026	0.0458
NPA	0.9783	0.8031	0.0372 ***	2.8054	0.0037 ***	4.2908	0.0729	0.6726	2.05E-0	0.0126	0.2675 *	1.9099
BOPO	0.1120	-1.8023	-0.0018	-1.0513	-0.0005 ***	-4.3418	0.0123	0.8504	7.44E-0	0.3429	0.0190	1.0185
LDR	-0.2023*	1.2027	-0.0001	-0.0786	-0.0003 ***	-3.1849	-0.0238**	-2.0475	-9.78E-0	-0.5601	-0.0286 *	-1.9002
NIM	0.1143	0.2516	0.0035 ***	2.9186	0.0002 ***	2.8367	0.0305 ***	3.0942	0.0015 ***	10.788	0.0615 **	4.8277
CGC	0.0035	2.1818	-0.0001	-0.8300	-5.23E-0 ***	-4.3913	0.0009	0.6465	-3.29E-0	-1.4888	-0.0010	-0.5674
CRG	0.3916 **	-2.4922	0.0061 ***	2.6817	0.0002	1.5158	0.0527 ***	2.8261	-6.33E-0	-0.2267	0.0072	0.3011
BIRATE	-3.4534**	1.7908	-0.0956***	-5.4291	-0.0036 ***	-3.1042	-0.3618**	-2.5140	-0.0031	-1.4791	-0.3174 *	-1.7085
INFLASI	1.5175 *	-0.8642	-0.0086	-0.8002	0.0023 ***	3.2435	0.1926 **	2.1883	-0.0005	-0.4536	0.1226	1.0796
KURS	-0.1471	0.3166	0.0039 *	1.8020	0.0002 *	1.7790	-0.0126	-0.7168	0.0005 **	2.0413	0.0495 **	2.1729
ECCG	2.0254		-0.0311	-0.3832	0.0105 **	1.9648	-0.3185	-0.4793	-0.0262 ***	-2.6356	0.5929	0.6913
Observasi	220		220		220		220		220		220	
Ajs R-squared	63 %		62 %		32%		64%		62%		53%	
Prob (F-Stat)	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	

\*\*\*) Significan at 1% \*\*) Significan at 5% \*) Significan at 1%

**TABLE 3**  
**SMEs FINANCING NPL REGRESSION RESULTS IN SECTOR 7 - 11**

	NPL_7		NPL_8		NPL_9		NPL_10		NPL_11	
	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat
Intercept	202.07	0.1026	-26.39	-0.2762	1.7965	0.0052	27.704	0.1459	-89.374	-1.1780
ROA	-0.0843	-0.6889	-0.0043	-0.7283	-0.0077	-0.3594	-0.0023	-0.2002	0.0024	0.5200
CAR	0.4783 *	1.8767	0.0110	0.8968	0.0861 *	1.9286	0.0420 *	1.7005	-0.0258 ***	-2.6302
NPA	0.3610	0.5860	0.0646 **	2.1623	0.0510	0.4724	0.0197	0.3297	0.0896 ***	3.7742
BOPO	0.0778	0.9457	-0.0016	-0.4228	0.0086 **	0.5976	0.0087	1.1110	-0.0061 *	-1.9343
LDR	-0.1089	-1.6450	-0.0093 ***	-2.8946	-0.0230	-1.9862	-0.0041	-0.6403	-0.0043 *	-1.6961
NIM	0.0068	0.1229	0.0160 ***	5.9138	-0.0279 ***	-2.8484	-0.0016	-0.3057	0.0202 ***	9.3694
CGC	0.0039	0.4742	-0.0002	-0.5808	-4.71E	-0.0320	-0.0003 **	-0.3773	0.0005	1.6426
CRG	0.2427 **	2.2932	0.0070	1.3774	0.0442 **	2.3850	0.0242 **	2.3357	0.0094 **	2.3146
BIRATE	-1.9099**	-2.3376	-0.0807 **	-2.0352	-0.3002**	-2.0963	-0.1872 *	-2.3616	-0.1891 ***	-6.0029
INFLASI	0.9496 *	1.9005	0.0574 **	2.3678	0.1989 **	2.2720	0.0849 *	1.7839	-0.0516 ***	-2.6786
KURS	-0.1571	-1.5650	-0.0003	-0.0708	-0.0334*	-1.8997	-0.0169	-1.7277	0.0144 **	3.7280
ECCG	0.6006	0.1592	0.0768	0.4197	0.6288	0.9512	-0.0131	-0.0356	0.4696	3.2296
Observasi	220		220		220		220		220	
Ajs R-squared	65%		58%		68%		59%		73%	
Prob (F-Stat)	0.0000		0.0000		0.0000		0.0000		0.0000	

\*\*\*) Significan at 10% \*\*) Significan at 5% \*) Significan at 1%

## 5 CONCLUSION

This study aims to identify the determinants of what factors affect the Non-Performing Loan (NPL) of MSMEs financing by business sector at Bank DKI Jakarta. The results of this study indicate that (i) the overall NPL of MSMEs is influenced by the CRG and BI 7 Days Repo Rate; (ii) NPLs in agriculture, livestock, forestry and fisheries sectors are affected by ROA, NPA, NIM, CRG, and BI 7 Days Repo Rate; (iii) NPLs in the mining and quarrying sector are affected by NPA, BOPO, LDR, NIM, CGC, BI 7 Days Repo Rate, Inflation and ECG; (iv) NPLs in the manufacturing sector are affected by CAR, LDR, NIM, CRG, BI 7 Days Repo Rate, and Inflation; (v) NPL of the Electricity, Gas and Clean Water sector is influenced by NIM, Kurs and ECG; (vi) NPL in construction sector is influenced by NIM and Exchange rate (vii) NPL of trade, hotel and restaurant sector is influenced by CRG and BI 7 Days Repo Rate (viii) NPL of transportation and communication sector is influenced by NPA, LDR, NIM, BI 7 Days Repo Rate, and inflation (ix) NPL in the financial sector, real estate and corporate services is influenced by BOPO, NIM, CRG, BI 7 Days Repo Rate, and Inflation; (x) NPL of Services is affected by CGC and CRG; (ix) NPL of other sectors is influenced by CAR, NPA, NIM, CRG, BI 7 Days Repo Rate, Inflation, and Exchange Rate.

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