

# The Impact of Efficiency, Profitability, Competition, Regulation, and Crisis Affect to Distribution of Msme Loans in Indonesia

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## ABSTRACT

Using 60 banks data in Indonesia from 2007-2018, this study aims to analyse the impact of efficiency, profitability, competition, government regulations, and crisis affect to MSME loan distribution in Indonesia. This study using STATA 15 version with time series panel data regression. Stochastic Frontier Analysis (SFA) approach use for calculating average bank efficiency, found that bank efficiency doesn't influence MSME credit growth, because bank with higher efficiency will be more careful in channelling credit, especially in MSME loans, as well as profitability that has no influence on the growth of MSME loans. Unlike the case with bank competition which has a positive and significant influence on MSME credit growth, this shows that banks in Indonesia are competing each other in distributing MSME loans, in line with regulations imposed by Bank Indonesia on MSMEs in PBI No. 17/12 / PBI / 2015. This study proves that the distribution of MSME loans remain stable even though the economy is experiencing a crisis or recession, the regulation also does not have a significant effect on MSME loans, due to the minimum loan portion in PBI regulation No. 17/12 / PBI / 2015 of 20% which must be distributed by banks has not been fully fulfilled. Macroeconomic control variable GDP also found to have an influence on MSME credit growth.

**Keywords:** Efficiency, Profitability, Competition, Government Regulation, Crisis, MSME Loan

## 1. INTRODUCTION

Based on Law Number 10 of 1998 concerning in banking sector, the aim of Indonesian banking is to support the implementation of national development to improve equity, economic growth, and national stability towards improving society's welfare. Banking financial institutions also have an important role as an intermediary institution that collect public funds in the form of deposits and distribute them in the form of credit. This intermediation function will run well if the surplus unit and deficit unit have confidence in the bank. The operation of the banking intermediary function will be increasing benefit

of funds. The funds have been collected then will be distributed to the public in various forms of productive activities. This productive activity will increase output, ultimately increase income and welfare of the community (Muharam and Purvitasari, 2007). The development of Indonesian banks experienced a very rapid decline in 1997 due to the economic crisis, many banks were closed, especially private banks by the government. The economic crisis has also impacted the banking crisis and has resulted in a decline in the performance of national banks.

The reasons for the closure of these banks are the number of banks that violate bank health regulations, many banks that have liquidity

problems, the problem of withdrawing customer deposits in banks, so there is no level of public trust. The banking condition problems after the economic crisis has caused to handle it seriously. Bank Indonesia has no other alternative to deal with the problem other than by closing the banking business with various terms including liquidity, freezing operations, stopping clearing, and freezing business activities.

The importance of the banks role in the economy and the large level of public trust must be maintained and made banks the most heavily regulated industry. Every provision made in the banking industry will ultimately lead to one goal, to produce a healthy, strong, and stable banking system. Thus, bank can perform its financial intermediary function optimally.

Banking is also one of financial institution that has an important role and demanded to have good performance. One important aspect in measuring banking performance is efficiency, which can be increased through reducing costs in the production process. Berger, et al., (1993), said, if there is a rapid change in financial structure, it is especially important to identify cost and revenue efficiency. More efficient banks are expected to get optimal benefits, more loan funds, and better service quality for customers. The level of efficiency achieved reflects the good quality of performance. Basically, the measurement of the performance of a financial institution is almost the same.

Besides the efficiency, bank financial performance can also be evaluated with profitability. Generally, bank sustainability depends on bank performance and profitability. This happens because banks must generate the income needed to cover their operational costs incurred in banking activities (Ongore and Kusa, 2013).

The Central Statistics Agency also illustrates that Indonesia's economic growth from 2010 to 2017 has increased although it is slow and not too significant, marked by improved credit growth, although the growth of Third Party Funds (DPK) was still experiencing a slowdown which caused

the bank's Loan to Deposit Ratio (LDR) to increase. Improved credit growth was also confirmed by a decrease in the lending standard index, especially in the aspect of lower lending rates, longer loan terms, and cheaper loan approval fees.

In line with Indonesia's economic growth, MSME loans in Indonesia also experienced a significant increase. Being one of the business sectors that was able to stand firm in the midst of the financial crisis in 1997-1998, Micro, Small and Medium Enterprises (MSMEs) showed its existence with the increasing number of MSMEs in the midst of the global financial crisis.

Bank Indonesia also issued Bank Indonesia Regulation (PBI) No 14/22 / PBI / 2012 dated 21 December 2012 concerning Lending by Commercial Banks and Technical Assistance in the Context of Developing Micro, Small and Medium Enterprises. In 2015, Bank Indonesia Regulation (PBI) concerning MSME changed to Bank Indonesia Regulation (PBI) No 17/12 / PBI / 2015, the regulation stated that the provision of MSME loans by Commercial Banks was increased from 5% to 20% of Total Credit distributed by commercial banks. This shows that the government provides a great support for the development of MSMEs in Indonesia.

Increasing developments in the banking world, competition considered to have an impact on efficiency and existence of banks. Developments in the Indonesian banking industry, is quite rapid, as evidenced by the increasing number of new banks that have emerged, causing tide competition between banks.

Anastasiya Shamsur and Laurent Weill (2019) mentioned in their research that the effect of bank efficiency can reduce credit costs, especially MSME credit costs, but does not have a significant effect on large companies. And overall research results prove that improving bank efficiency can help increase credit growth.

Houssam Bouzgarrou, et al (2017) research on 170 commercial banks operating in Paris in the period 2000 - 2012, shows that foreign banks

have better profitability compared to domestic banks, especially in times of financial crisis.

Nimrod Segev and Matthew Scaffer (2018), in a study conducted on banks in the United States in 1994-2008 stated that competition strongly influenced monetary policy in terms of bank lending. In his research also mentioned that banks with strengthen in their regulations are banks that survive in a situation of global financial crisis.

Aneta Hryckiewicz (2014) in a study conducted in 23 financial crisis situations in 23 different countries, found the results that government involvement in the banking world during the financial crisis was inevitable and helped countries through difficult times in dealing with crises by providing bailouts. Regression results show that government intervention further increases banking risk in the aftermath of the financial crisis, at least there are three risk factors that arise, reducing market discipline, inefficient management, and lack of restructuring processes that help banking recovery after the financial crisis.

Patrick Behr, et al, (2017) explained that banks adhere to government policies have a credit cycle risk 25% lower than banks that do not comply with government policies. Because the existence of policies from the government can reduce banking risks and stabilize the financial situation.

## 2. METHODS

This research uses secondary data obtained from business entity information, previous research or authority institutions that have become public secret. The data used is the financial statements of 60 banking companies registered during the 2007-2018 period and obtained from statistical data on the OJK website, Indonesia.

The main variable (dependent) in this study is the Distribution of MSME Credit (Y). Dummy crisis variable where in 2008 during the global financial crisis and 2013 when the rupiah weakened. Regulatory dummy for implementing

regulations starting in 2017. While the independent variable used is bank efficiency is measured by Stochastic Frontier Analysis (SFA), bank profitability as measured by Return on Assets (ROA) and Return on Equity (ROE), bank competition as measured by Lerner Index (LI).

### 2.1 Efficiency

This study uses the efficiency measurement of the Stochastic Frontier Analysis (SFA) method by using an intermediation approach that is formulated as a relationship between banking inputs and outputs (Anastasiya Shamsur, Laurent Weill; 2019). Efficiency occurs if the company produces optimum output which is the result of a combination of a certain number of inputs. In this method, the output of a bank is modeled to deviate from its production efficient frontier due to random noise and inefficiency. The output used in this study is total bank credit, using two research inputs namely interest expense and banking operational costs. The Stochastic Frontier Analysis function with the intermediation approach in this study is formulated as follows:

$$\ln\left(\frac{TC}{W_3}\right) = \beta_0 + \sum_m \alpha_m \ln y_m + \sum_n \beta_n \ln\left(\frac{W_n}{W_3}\right) + \sum_n \sum_m \gamma_{nm} \ln\left(\frac{W_n}{W_3}\right) \ln y_m + u + v$$

Where TC is the Total Cost (Total Cost),  $y_m$  is  $m$ th bank output ( $m = 1,2$ ),  $W_n$  is  $n$ th bank input (1,2),  $W_3$  is the interest expense,  $u$  is inefficiency, and  $v$  is random error.

The measurement results of the SFA method that appear are in the form of a score between 0 - 1. The closer the number 1 is, the more efficient the bank is. Conversely, if the value is close to 0 then the bank is more inefficient.

### 2.2 Profitability

Kasmir (2014) explains that the measurement results can be used as an evaluation tool for management work so far, whether they have worked effectively or not. Failure or success can be used as a reference for future earnings

planning, as well as the possibility to replace new management, especially after old management fails. Therefore, profitability is often referred to as one measure of management performance.

Indicators that can be used to measure profitability are:

*Return on Asset (ROA)*

Return on Assets (ROA) shows the company's ability to generate profits from the assets used. Return on Assets (ROA) is the most important ratio among existing profitability ratios (Ang, 1997). ROA according to (Ang, 1997) can be calculated using the formula:

$$ROA = \frac{Net\ Income}{Total\ Asset} \times 100\%$$

*Return on Equity (ROE)*

ROE includes profitability parameters and is an indicator to estimate the ability of banks to obtain net profit and is calculated based on net income (net profit after tax) with own capital. This ratio is influenced by the size of the company's debt, if the proportion of debt gets smaller then this ratio will also be smaller, and vice versa.

$$ROE = \frac{Net\ Income}{Total\ Equity} \times 100\%$$

### 2.3 Competition

The competition that occurs in banking is the impact of the various types of competition that exist in the banking industry market. Diverse types of markets will produce diverse effects on the behaviour of each bank in the banking industry. In the banking industry, the value of competition can be calculated using the Lerner Index as market power formulated as follows:

$$Lerner\ Index = \frac{Price_{i,t} - Marginal\ Cost_{i,t}}{Price_{i,t}}$$

$Price_{i,t}$  = Ratio from total revenue to total asset  $i$  at time  $t$  (Berger et al, 2009)

$Marginal\ Cost_{i,t}$  = Marginal cost bank  $i$  at time  $t$

$$MC_{i,t} = \frac{TC_{i,t}}{TA_{i,t}} (\alpha_1 + \alpha_2 \ln TA_i + \sum_{j=1}^3 \beta_j \ln w_{j,t})$$

$MC_{i,t}$  = Marginal cost bank  $i$  at time  $t$

$TC_{i,t}$  = Total cost bank  $i$  at period  $t$

$TA_{i,t}$  = Total asset reflects output bank  $i$  at time  $t$

$W_{1,it}$  = Working capital divided by total asset bank  $i$  at time  $t$

$W_{2,it}$  = Funding cos bank  $i$  at time  $t$  measure with interest ratio to third party fund (DPK)

$W_{3,it}$  = Operational expenses bank  $i$  at time  $t$  measure with cost operational ratio and other administration expenses to total asset

### 2.4 Panel Data Regression Analysis

$$MSME\ Credit = \alpha + \beta_1 Eff_{it} + \beta_2 Prof_{it} + \beta_3 Comp_{it} + \beta_4 Crisis_{it} + \beta_5 Regulasi_{it} + \beta_6 Inf_{it} + \beta_7 GDP_{it} + \epsilon$$

MSME Credit = MSME Credit Distribution

A = Constanta

EFF = Efficiency

Prof = Profitability

Comp = Competition

INF = Inflation

GDP = Gross Domestik Product

Crisis = dummy for crisis

REG = dummy for regulation

E = error

### 2.5 Dummy Variable

Dummy variables are called additional variables that are categorical that have an influence on variables that are continuing. The crisis used in this study is the financial crisis that occurred in 2008 and a situation where

many foreign portfolio investments released from Indonesia due to the Fed's 2013 plan to reduce Quantitative Easing QE.

Regulation based on PBI No. 17/12 / PBI / 2015, the need for a policy on MSME credit to be able to improve access to bank credit to MSME.

Crisis

Value 1 = if during a crisis

Value 0 = if not a crisis

Regulation

Value 1 = if during the validity of the regulation

Value 0 = if before regulation

### 3. RESULTS AND DISCUSSION

#### 3.1 Descriptive Statistics

Descriptive analysis is the most basic analysis to describe the state of data in general. This descriptive analysis includes several things, namely frequency distribution, measurement of central tendency, and measurement of variability (Wiyono, 2001). In table 2 shows the variables that form this research model:

**Table 2** Descriptive Statistics

Indikator (Variabel)	Obs.	Mean Stat	Max Stat	Min Stat	Std Dev
MSME's LOAN	720	7.157348	12.58321	-1.203973	2.085049
EFFICIENCY	720	.7144272	.859568	.6640821	.037381
LERNER INDEX	720	.2682196	1	-94.14706	4.006403
ROA	720	.0179383	.231	-.5209	.0304354
ROE	720	.1196071	4.0286	-9.8163	.4350649
INFLATION	720	-3.019273	-2.201835	-3.582719	.4589675
GDP	720	6.659441	6.948897	6.068888	.2811752
REGULATION	720	.1666667	1	0	.3729371
CRISIS	720	.1666667	1	0	.3729371

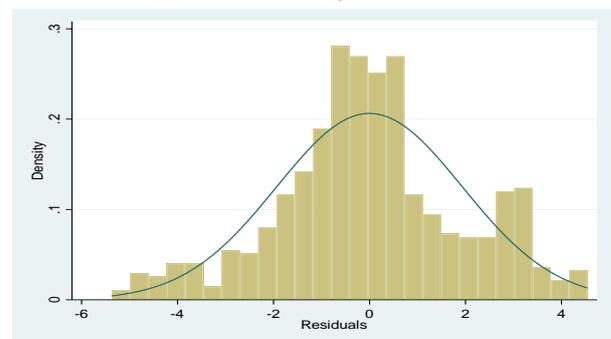
Source: Data processed with Stata 15, 2020

From table 2, there are 720 numbers of samples (N) observed. Based on the descriptive statistical results, it can be concluded that the percentage of MSME Credit variables has a mean of 7.157348, a minimum value of -1.203973, a maximum value of 12.58321 with a standard deviation of 2.085049. If the mean > than the standard deviation it shows that the MSME Credit variable indicates a stable result. Similarly, variables that have other stable data can be seen from the standard deviation which has a value lower than the mean variable, namely Efficiency and GDP. For variables classified as having high data deviation are Lerner Index, Inflation, ROA, ROE, Regulation, and Crisis.

#### 3.2 Classic Assumption Test

##### 3.2.1 Normality Test

**Graph 1** Normality Test Result



Source: Data processed with Stata 15, 2020

**Table 3** Normality Test Result

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
res	720	0.3626	0.6962	0.99	0.6110

Source: Data processed with Stata 15, 2020

From the results of the normality test above, it can be concluded that the data used are normally distributed, this can be seen in graph 1 histogram diagram resembling a bell and normality test results have a Prob> chi2 value of 0.6110 greater than the value of 0.05.

3.2.2 *Multicollinearity Test*

**Table 4** Multicollinearity Test Result

Variable	Centered VIF	1/VIF
C	NA	NA
EFFICIENCY	1.01	0.989147
ROA	2.76	0.362177
ROE	2.76	0.361889
LERNER INDEX	1.01	0.986923
CRISIS	1.79	0.557963
REGULATION	1.33	0.754382
INFLATION	2.06	0.486159
GDP GROWTH	1.32	0.758051

Source: Data processed with Stata 15, 2020

According to the results listed in the table indicate that there is no multicollinearity, because the Centered VIF value of all variables is less than 10.

3.2.3 *Heteroscedasticity Test*

**Table 5** Heteroscedasticity Test Result

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Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of LnKreditUMKMY

chi2(1)      =      3.34
Prob > chi2  =      0.0676
```

Source: Data processed with Stata 15, 2020

From the results of the heteroscedasticity test above using the Breusch-Pagan / Cook-Weisberg test showed a value of Prob> chi2 (0.0676)> 0.05, the test results showed that the research data contained no symptoms of heteroscedasticity or H0 was accepted.

3.3 *Selecting Panel Data Regression Model Estimate*

3.3.1 *Chow Test*

**Table 6** Chow Test Result

```
F( 58, 655) = 75.19
Prob > F = 0.0000
```

Source: Data processed with Stata 15, 2020

Based on the information above, this shows a probability value of (0.0000) less than alpha 5% (0.05), so that the FEM (Fixed Estimation Model) regression panel estimation was chosen as the right estimation.

3.3.2 Hausman Test

Table 7 Hausman Test Result

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. hausman fe re
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	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
LIX2	.0632254	.0640378	-.0008124	.0001947
ROAX3	-.1764211	.0733666	-.2497877	.1255761
ROEX4	-.020085	-.0269221	.0068371	.
Regulasi	.0867497	.0874216	-.0006719	.
Krisis	.0822739	.082301	-.0000271	.
LnGDP	1.907328	1.906455	.0008731	.
LnInflasi	-.0981542	-.0983748	.0002206	.

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 17.32  
 Prob>chi2 = 0.0155  
 (V\_b-V\_B is not positive definite)

Source: Data processed with Stata 15, 2020

According to the results in the table the value generated from the probability of Cross Section Prob> chi2 (0.0155) is less than alpha 5% (0.05), so the Fixed Estimation Model panel regression is chosen. Both tests show the same estimate. That is FEM (Fixed Estimation Model), so there is no need to do the Langange

Multiplier test to compare between REM (Random Effect Model) and Common Effect Model (CEM). The final decision is the FEM (Fixed Estimation Model) based on the Chow and Hausman Test.

3.3.3 Multiple Regression Analysis Result

Table 8 Multiple Regression Analysis Result

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Fixed-effects (within) regression
Group variable: IDBank
```

LnKreditUM-Y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
EfisiensiX1	0	(omitted)			
LIX2	.0632254	.0077355	8.17	0.000	.0480359 .078415
ROAX3	-.1764211	1.843732	-0.10	0.924	-3.796779 3.443937
ROEX4	-.020085	.1121749	-0.18	0.858	-.2403521 .200182
Regulasi	.0867497	.0843782	1.03	0.304	-.0789356 .252435
Krisis	.0822739	.0980811	0.84	0.402	-.1103186 .2748663
LnGDP	1.907328	.1116278	17.09	0.000	1.688135 2.126521
LnInflasi	-.0981542	.0853814	-1.15	0.251	-.2658093 .0695009
_cons	-5.880305	.7363037	-7.99	0.000	-7.326114 -4.434497
sigma_u	1.8540772				
sigma_e	.73247487				
rho	.86499672	(fraction of variance due to u_i)			

Number of obs = 720  
 Number of groups = 60  
 Obs per group: min = 12, avg = 12.0, max = 12  
 F(7, 653) = 73.57  
 Prob > F = 0.0000  
 R-sq: within = 0.4409, between = 0.0573, overall = 0.1102  
 corr(u\_i, Xb) = 0.0332  
 F test that all u\_i=0: F(59, 653) = 75.06 Prob > F = 0.0000

Source: Data processed with Stata 15, 2020

From the above table, it is explained that in the research there are 720 observation samples, with an F test value (0.0000) less than 0.05 which indicates that the F test accepts H1 at a significant level of 5% or which means that all independent variables simultaneously have an influence which is significant for the dependent variable.

**3.4 Feasibility Test Panel Data Regression Model**

**3.4.1 Coefficient of Determination (R2)**

The coefficient of determination ranges between numbers 0 and 1. While the R-square value is said to be good if the value

reaches above 0.5. If the R-square value is small it is said that the limited ability of the independent variable (free) in explaining the dependent variable (bound). A value close to one means that the independent variable provides almost all the information needed to predict the dependent. Based on table 4.9, the results of the R-Squared analysis of 0.4409 (44%) so that the independent variable is able to explain the dependent variable worth 44%, the remaining 56% is influenced by other variables outside the regression model.

**3.4.2 Partial Test (T Test)**

**Table 9 Partial Test Result**

Variable	fe	re	ols
EfisiensiX1	5.3990313	5.3990313	5.3990313
LIX2	.06403783***	.06403783***	.06403783***
ROAX3	.07336662	.07336662	.07336662
ROEX4	-.02692215	-.02692215	-.02692215
Regulasi	.08742157	.08742157	.08742157
Krisis	.08230097	.08230097	.08230097
LnGDP	1.9064547***	1.9064547***	1.9064547***
LnInflasi	-.09837482	-.09837482	-.09837482
_cons	-9.7363689*	-9.7363689*	-9.7363689*
N	720	720	720
R2			
R2_a			

legend: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Data table 9 above is the partial T test results with the coefficient values from the Fixed Estimation Model (FE) test, Random Estimation Model (RE), and Ordinary

Least Square (OLS). The asterisks in table 9 above indicate that the competition variable (lerner index) and GDP Growth accept H1.

**Table 10 T Test Result**

Variabel	Sig. Standard	Prob.	Hipotesis
EFFICIENCY	0.05	0.393	Rejected
COMPETITION	0.05	0.000	Accepted
ROA	0.05	0.924	Rejected
ROE	0.05	0.858	Rejected
INFLATION	0.05	0.251	Rejected
GDP GROWTH	0.05	0.000	Accepted
CRISIS	0.05	0.402	Rejected
REGULATION	0.05	0.304	Rejected

Source: Data processed with Stata 15, 2020

T test results for table 10 above are prob> t from the Fixed Estimation Model (FEM) test results in table 8 where the probability of competition (0,000) and GDP Growth (0,000) means that the variable receives H1.

#### 3.4.3 F Test

This simultaneous test aims to determine whether there is an effect between efficiency, competition, and profitability on MSME loans. The significant value used is 95% or 5% ( $\lambda = 0.05$ ). Based on the data in table 8 the value of prob 0.0000 <5% (0.05) means that all independent and dependent variables will have an effect simultaneously. Means having the conclusion H0 is rejected and Ha is accepted

## 4. CONCLUSION

In this study variable bank efficiency does not increase MSME credit growth, because the more efficient a bank is, the bank will be more careful in channelling loans, especially in MSME loans. Bank competition has a positive and significant influence on MSME credit growth. This shows that banks in Indonesia compete in the distribution of MSME loans, in line with regulations set by Bank Indonesia for MSMEs in PBI No. 17/12 / PBI / 2015.

In general, profitability does not significantly influence the growth of MSME loans, this is because banks that have high profits

will reduce costs, including credit costs, so bank profitability does not significantly influence MSME credit growth.

In this study, inflation has a negative and not significantly affected on MSME credit growth (Prob. Inflation 0.251> 0.05). This shows that the inflation rate does not affect a person's decision to take MSME credit in banks, because many MSMEs survive in a crisis and inflation condition. Unlike the case with GDP growth which gives a significant positive effect on MSME credit growth (Prob. GDP growth 0.0000 <0.05). This shows that GDP growth affects lending especially in the MSME sector, the higher the GDP growth in Indonesia, the greater the lending to the MSME sector by banks in Indonesia, because the MSME sector also develops. The crisis dummy variable does not affect the percentage of MSME credit. The crisis that occurred in 2008 and 2013 did not affect the distribution of MSME loans.

There are dummy variables, crisis and regulation. Crisis that acts as a dummy variable in research has not yet succeeded in proving that it has a significant influence on MSME credit growth. This proves that MSME lending will remain stable even though the economy is experiencing a shock. Based on the results of the output shows a positive and insignificant effect of the regulatory variables on MSME loans. This study found that the existence of regulation did not have a significant effect on MSME credit, due to the minimum number of loan portions in PBI

regulation No. 17/12 / PBI / 2015 of 20% which must be distributed by banks has not been fully fulfilled.

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