“MSME lending and bank efficiency: Evidence from Indonesia”

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MSME LENDING AND BANK EFFICIENCY: EVIDENCE FROM INDONESIA

Abstract

Banks prefer to lend to bigger clients for a variety of reasons, including transaction costs and risk considerations. Due to this phenomenon, the Central Bank of Indonesia issued a regulation that requires banks to channel a minimum proportion of their credit portfolio to micro, small, and medium enterprises (MSMEs). Nevertheless, the impact of channeling funds to MSMEs remains a subject of controversy, in part depending on the dimensions and metrics used. This study examines how MSME lending affects the efficiency of banks in Indonesia, a country where MSMEs constitute more than 99% of business entities. Using a total of 175 panel data observations of banks in Indonesia from 2014–2018, banks' cost efficiency is first estimated using a stochastic frontier approach (SFA). Panel data regression is used to examine the impact of MSME lending on efficiency. The result of this study shows a significant and positive impact of the proportion of MSME lending on bank efficiency, which indicates that requiring banks to channel funds to MSMEs does not only potentially support economic development, but also is beneficial from the business perspective in the Indonesian context.

Keywords bank, MSME lending, cost efficiency, stochastic frontier approach, Indonesia

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INTRODUCTION

Access to financing is one of the main drivers of business sustainability. In this case, banks play a vital role in enabling financial access for small-scale companies, as bank financing is one source of financing for micro, small, and medium enterprises (MSMEs). At the same time, MSMEs play a significant role in the economy due to their ability to generate employment and innovation that will drive economic development (Beck & Demirgüç-Kunt, 2004).

In Indonesia, most enterprises can be classified as MSMEs. According to the Ministry of Cooperatives and SMEs, as of 2018, there are more than 62 million MSMEs in Indonesia, accounting for 99.99% of businesses. In terms of their impact on the economy, MSMEs contributed around 60% of Indonesia's total Gross Domestic Product (GDP) in 2017. In addition, MSMEs have a significant contribution to employment, contributing to 97.02% of total employment in Indonesia (Ministry of Cooperatives and SMEs, 2018).

Nevertheless, the level of financial inclusion from MSMEs in Indonesia only reaches around 30% with a distribution of 76.1% getting access to funding through banks and 23.9% getting access to funding through non-bank financial institutions (Central Bank of Indonesia, 2015). The government and the Central Bank of Indonesia have taken several important measures to bridge the MSME financing gap. The Central Bank issued Regulation No. 17/12/PBI/2015, which sets a threshold for

MSME loans that commercial banks must meet. Meanwhile, in 2007, the government of Indonesia issued a portfolio credit scheme named *Kredit Usaha Rakyat* (People Business Credit/KUR), which is partly guaranteed by institutions appointed by the government (Tambunan, 2017).

Despite these policy initiatives, banks still perceive MSMEs as opaque institutions that have higher asymmetric information and serve a higher credit risk than large enterprises. Previous studies have examined the impact of MSME lending on banks' performance in terms of profitability and risks (see for example, Boadi et al., 2016; Shihadeh et al., 2019). The relationship between MSME lending and efficiency is an issue that began to receive attention in the literature, with conflicting results (see among others, Liang et al., 2017; Chih et al., 2018).

Therefore, this study focuses on how MSME loans affect bank efficiency. Following previous studies that examined bank's efficiency, the study also attributes some variables to be employed as control variables into the model, namely profitability, management capability, capital adequacy ratio, and regional banks. In examining the issue, this paper employs stochastic frontier analysis (SFA) to estimate the efficiency scores of Indonesian banks, implementing the maximum likelihood estimation method to estimate the stochastic cost function based on the same model popularized by Battese and Coelli (1995). A random effect regression model is employed to investigate the relationship of MSME lending on the efficiency of Indonesian banks.

1. LITERATURE REVIEW AND HYPOTHESIS

1.1. MSME lending

MSMEs have various definitions across several countries and agencies, largely depending on their value of income, value of assets, number of employees, and extent to the global economy. While MSMEs generate a significant impact in economic and social perspectives, they tend to have a low information quality in respect to credit market information. This has resulted in MSMEs being a subject of credit rationing, suffering significantly higher credit restrictions compared to large enterprises and hindering their business development (Stiglitz & Weiss, 1981). This has become an important topic for policymakers in many countries, as they have tried to take various measures to catch up with the imperfection of the credit market mechanism.

From the lenders' perspective, MSMEs are often perceived as having significant limitations in the information and skills required to access external finance (OECD, 2006). Research conducted by the International Finance Corporation (IFC) states that the biggest challenge for banks in providing access to funding to MSMEs is the high credit risk endured by banks, resulting from a lack of quality in information exchanges between the creditors and the lender (IFC, 2019). Thus, MSMEs are being subjected to tighter credit restrictions compared to those applied for large enterprises (Stiglitz & Weiss, 1981). The absence of a sufficient collateral value leads banks to perceive that MSMEs have higher levels of risk than large enterprises that have fewer problems in meeting the collateral requirement. However, an empirical investigation by Shihadeh et al. (2019) shows a negative association between the proportion of MSME lending and banks' risk level.

Furthermore, in a financial world that includes transaction costs and asymmetric information, small-scale businesses such as MSMEs with smaller loan requests are perceived as having higher transaction costs compared to large enterprises. These factors result in MSMEs facing a higher risk premium because MSMEs are perceived to have lower levels of information disclosure and have fewer guarantees to offer, resulting in banks becoming reluctant in serving MSMEs financing (Beck & Demirguc-Kunt, 2006). On the other hand, in the context of Ghanaian banks, Boadi et al. (2016) found that MSMEs credit has a positive impact on banks' profitability.

Numerous factors could affect a bank's tendency to finance MSMEs. Boushnak et al. (2018) noted

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that factors such as the owner's character, capacity, capital adequacy, credit score, and the availability of credible information related to company finances are the deciding factors for the bank's decision to provide loans to MSMEs. Another study conducted by Duarte et al. (2016) concluded that personal collateral factors have a positive correlation with lending to MSMEs. Furthermore, the study concluded that younger companies use personal guarantees as a signal of creditworthiness and commitment to access loans and encourage the importance of producing and sharing personal information among lenders to reduce asymmetric information and the need for collateral in the form of assets.

1.2. Bank efficiency

Siudek (2008) described efficiency as an indicator that shows the ability of managers and company staff to maintain a level of income and profit growth above the level of an increase in operational costs, while Gordo (2013) mentions that the basic notion of efficiency is the ratio between output and input. Berger and Mester (1997) further defined another means of efficiency: cost efficiency, which measures the level of costs incurred by best-practice banks to produce the same amount of output under the same conditions. Bank efficiency is a significant influence for many variables, mainly the credit interest rate. The efficiency of the bank operations is one of the key variables in determining lending rates, thus influencing a bank's behavior in setting interest rates (Schluter et al., 2012). Pasiouras et al. (2008) also stated that efficiency has a significant influence on a bank's stocks performance.

Numerous studies investigate variables that affect banks' efficiency. Oral and Yolalan (1990) mentioned that there is a relationship between efficiency and profitability. Řepková (2015) and Banna et al. (2017) stated that profitability has a negative effect on efficiency. Sari and Saraswati (2017) also stated that a bank's efficiency is influenced by its profitability. Bank efficiency is also influenced by the managerial capability, measured by the cost-income ratio as Pasiouras and Kosmidou (2007) stated that, as the level of a bank's costs grow, the bank's efficiency would plummet. Moreover, Bernauer and Koubi (2002) and Das and Ghosh (2006) showed that there is a positive relationship between the capital adequacy ratio and banks' efficiency, while banks with a higher level of capital adequacy tend to have better credit risk management strategies and lower borrowing costs, which increase their efficiency.

Another factor that influences the level of bank efficiency is the status of regional banks, which could give it an arbitrary advantage in its efficiency level. The arbitrary advantage possessed by a regional bank lies in its ability in the relationship lending factor. This, then, improves the quality of information exchange between creditors and debtors. The existence of these factors makes the efficiency of regional development banks higher (Berger & Udell, 1995). In the Indonesian context, regional banks are known as *bank pembangunan daerah* (BPD). BPD is established to provide financing for regional development projects, thus focusing its credit channel on regional-sized projects and local businesses.

1.3. MSME lending and efficiency

The earlier subsection demonstrates that there is inconclusive evidence on the overall effect of MSME lending on bank performance. One aspect of bank's performance that is overlooked in the existing literature when examining the effect of MSME lending is efficiency, as research in this area is very limited and yields conflicting results. Among the existing studies, Liang et al. (2017) examine the relationship between MSME lending and bank efficiency and found a negative association. They argue that this is due to the higher asymmetric information among MSMEs compared to the bigger counterparts. In addition, as a response to address the higher asymmetric information, banks are forced to incur additional costs. These further lead to inefficiencies among banks with high proportions of MSMEs lending. On the other hand, Chih et al. (2018) show a positive relationship between MSME lending and bank efficiency. It is not clear how MSME lending correlates with bank efficiency in the context of Indonesian banks. Therefore, the main hypothesis of this study is:

H1: MSME lending significantly affects bank efficiency.

Following evidence provided by previous studies, return on average assets (ROAA) is included as a proxy of profitability, cost to income ratio (CIR) as a proxy of managerial capability, and capital adequacy ratio (CAR) and Regional Bank as control variables in the model. The summary of the hypothesis for all independent variables is provided in Table 1.

Table 1. Summary of hypothesis and testing type

Variable	Hypothesis testing	Alternative hypothesis
SME	Two-tailed	$\beta \neq 0$
ROAA	Two-tailed	$\beta \neq 0$
CIR	One-tailed	$\beta > 0$
CAR	One-tailed	$\beta > 0$
REGBANK	One-tailed	$\beta > 0$

2. RESEARCH METHODS

The collected data in this study are mainly sourced from BankFocus, Datastream, financial statements, and reports from Indonesia's Financial Services Authority (*Otoritas Jasa Keuangan*/OJK). A five-year sampling period from 2014 to 2018 is used, as there is an aim to incorporate the most recent data in the study. After going through the screening process in the form of data cleaning, 35 banks were selected for the sample. Therefore, this study employs a total of 175 observations, constructing a balanced panel data, while the data are mostly nominal accounts, referring to Indonesian Rupiah (IDR) currency. For outliers in this study, the winsorizing process with a threshold of 5% was conducted.

This study uses stochastic frontier analysis (SFA) to estimate the efficiency of banks. One major advantage in using SFA lies in its ability to be used in estimating panel data, as well as the ability to distinguish between inefficiency term and other stochastic shocks from the error term more accurately to estimate the efficiency scores. In addition, the SFA method also has a relatively better statistical power than the other commonly used method in the topic of efficiency, namely the data envelopment analysis (DEA) (Asmare & Begashaw, 2018; Huang & Wang, 2002).

The Battese and Coelli (1995) cost function model was employed to investigate the efficiency scores of each observation using the translog cost function by using three types of inputs and three types of output based on the model used by Christensen et al. (1973) using labor costs, capital costs, and funding costs. The translog cost function should meet the regularity condition of the model that an input share equals the derivative of the log cost function vis-à-vis to the corresponding log input price. The regularity condition by normalizing the total cost and all input costs by the price of labor was applied. The cost function is carried out using the stochastic frontier analysis to estimate the efficiency scores of each observation. Table 2 describes the variable definitions for the cost function, and the cost function is shown by equation 1.

$$\begin{aligned}
\ln\left(\frac{TC}{P_{2it}}\right) &= \alpha_0 + \alpha_1 \ln Y_{1it} + \alpha_2 \ln Y_{2it} + \\
&+ \alpha_3 \ln Y_{3it} + \beta_1 \ln\left(\frac{P_{1it}}{P_{2it}}\right) + \beta_3 \ln\left(\frac{P_{3it}}{P_{2it}}\right) + \\
&+ \frac{1}{2}\alpha_{11}\left(\ln Y_{1it}\right)^2 + \frac{1}{2}\alpha_{22}\left(\ln Y_{2it}\right)^2 + \\
&+ \frac{1}{2}\alpha_{33}\left(\ln Y_{3it}\right)^2 + \alpha_{12} \ln Y_{1it} \ln Y_{2it} + \\
&+ \alpha_{13} \ln Y_{1it} \ln Y_{3it} + \alpha_{23} \ln Y_{2it} \ln Y_{3it} + \\
&+ \frac{1}{2}\gamma_{11}\left(\frac{\ln P_{1it}}{\ln P_{2it}}\right)^2 + \frac{1}{2}\gamma_{33}\left(\frac{\ln P_{3it}}{\ln P_{2it}}\right)^2 + \\
&+ \gamma_{13} \ln\left(\frac{P_{1it}}{P_{2it}}\right) \ln\left(\frac{P_{3it}}{P_{2it}}\right) \rho_{11} \ln Y_{1it} \ln\left(\frac{P_{1it}}{P_{2it}}\right) + \\
&+ \rho_{13} \ln Y_{1it} \ln\left(\frac{P_{3it}}{P_{2it}}\right) + \rho_{21} \ln Y_{2it} \ln\left(\frac{P_{1it}}{P_{2it}}\right) + \\
&+ \rho_{23} \ln Y_{2it} \ln\left(\frac{P_{3it}}{P_{2it}}\right) + \rho_{31} \ln Y_{3it} \ln\left(\frac{P_{1it}}{P_{2it}}\right) + \\
&+ \rho_{33} \ln Y_{3it} \ln\left(\frac{P_{3it}}{P_{2it}}\right) + v_{it} + u_{it},
\end{aligned} \tag{1}$$

where lnTC = total cost of a bank; Y_{1it} = loans of bank i for period t; Y_{2it} = investment of bank i for period t; Y_{3it} = non-interest income of bank i for period t; P_{1it} = price of funding of bank i for period t; P_{2it} = price of labor of bank i for period t; P_{3it} =

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Table 2. Variable definitions of cost function

Variable	Notation	Definition
Total cost (IDR 1,000,000)	TC	Labor cost + capital cost + funding cost
Fund cost (IDR 1,000,000)	X_1	Deposits + borrowing
Labor cost (IDR 1,000,000)	X_2	Staff expenses
Capital cost (IDR 1,000,000)	X_3	Net fixed assets
Price of funding (%)	P_1	Interest payments / (Deposits + Borrowing)
Price of labor (IDR 1,000,000)	P_2	Staff expenses / Total employees
Price of capital (%)	P_3	Operating expense / Net fixed assets
Output 1 (IDR 1,000,000)	Y_1	Loans
Output 2 (IDR 1,000,000)	Y_2	Investment (Interest-bearing investments + Non-interest-bearing investment)
Output 3 (IDR 1,000,000)	Y_3	Non-interest income

price of capital of bank *i* for period *t*; v_{it} = random error of bank *i* for period *t*; u_{it} = inefficiency term of bank *i* for period *t*.

After the estimation process, the deviation from the cost frontier can be defined as an error term (e_{it}). Then, the error term can be separated between random error (v_{it}) and inefficiency term (u_{it}), both of which are assumed to be independent of each other and are a function of the factors that cause cost inefficiency. Specifically, it is assumed that the inefficiency term comes from the truncated-normal distribution (Liang et al., 2017). The inefficiency terms can then be estimated to be cost efficiency scores using the estimation model used by Battese and Coelli (1995) in equation 2.

$$EFF_{it} = \exp\left(-u_{it}\right), \tag{2}$$

where EFF_{it} = efficiency score of bank *i* for period *t*; u_{it} = inefficiency term of bank *i* for period *t*.

According to the cost function, the resulting cost efficiency score has a range from 0 to 1. This means that the higher the score, the higher the cost efficiency of a bank (Liang et al., 2017). This score can be interpreted inversely with a bank's inefficiency score. For example, an observation that has an efficiency score of 0.3 means it has an inefficiency score of 0.7.

The efficiency score is then incorporated to be used as a dependent variable for the regression model to capture the main determinants of bank efficiency in Indonesia. Referring to a previous study conducted by Liang et al. (2017), the main independent variable of this study is the proportion of MSME loans with a proxy of the percentage of loans extended to MSMEs against total loans. This study uses four control variables, namely profitability, manager's capability, capital adequacy ratio, and regional banks. Therefore, the following model is specified:

$$\begin{aligned} EFF_{it} &= \beta_0 + \beta_1 SME_{it} + \beta_2 ROAA_{it} + \\ &+ \beta_3 CIR_{it} + \beta_4 CAR_{it} + \beta_5 REG_{it} + \varepsilon_{it}, \end{aligned} \tag{3}$$

where EFF_{it} = efficiency score of bank *i* for period *t*; SME_{it} = proportion of bank *i* for period *t*; $ROAA_{it}$ = return on average assets of bank *i* for period *t*; CIR_{it} = cost-income ratio of bank *i* for period *t*; CAR_{it} = capital adequacy ratio of bank *i* for period *t*; REG_{it} = the regional bank status of bank *i* for period *t*.

Table 3 describes the definitions of variables in the efficiency model.

Table 3. Variable definitions and descriptions in the efficiency model

Variable	Notation	Description
Dependent variable		
Bank's efficiency	EFF	Bank's efficiency scores calculated using SFA
Independent variable		
SME loans	SME	Ratio of MSME loans to total credit
Profitability	ROAA	Ratio of net income to average total asset
Manager's capability	CIR	Ratio of operating expenses divided by operating income that has been subtracted by net interest income
Capital adequacy ratio	CAR	Capital adequacy ratio
Regional banks	REGBANK	Dummy variable with the score of 1 if a bank is categorized as a regional bank, and 0 if others

3. RESULTS AND DISCUSSION

Table 4. Results of the stochastic cost frontier model

Variable	Coefficient	SE	P > |z|
Frontier			
LnY_1	3.4790	1.7275	0.0440**
LnY_2	0.3946	0.5426	0.4670
LnY_3	0.7225	0.3319	0.0290**
LnP_1P_2	–1.4947	0.4927	0.0020***
LnP_3P_2	1.6739	0.3620	0.0000***
$1/2Ln(Y_1)^2$	–27.0976	18.4380	0.1420
$1/2Ln(Y_2)^2$	(omitted)	(omitted)	(omitted)
$1/2Ln(Y_3)^2$	14.9418	5.7325	0.0090***
LnY_1LnY_2	–0.02565	0.0192	0.1830
LnY_1LnY_3	–5.2788	3.3214	0.1120
LnY_2LnY_3	–0.6763	3.2163	0.8330
$1/2Ln(P_1/P_2)^2$	–0.2386	0.0560	0.0000***
$1/2Ln(P_3/P_2)^2$	0.2006	0.0553	0.1020
$Ln(P_1/P_2)\cdot Ln(P_3/P_2)$	0.0521	0.0318	0.7080
$LnY_1\cdot Ln(P_1/P_2)$	–0.0088	0.0236	0.8670
$LnY_1\cdot Ln(P_3/P_2)$	–0.0060	0.0364	0.4350
$LnY_2\cdot Ln(P_1/P_2)$	0.0339	0.0435	0.2270
$LnY_2\cdot Ln(P_3/P_2)$	(omitted)	(omitted)	(omitted)
$LnY_3\cdot Ln(P_1/P_2)$	0.0494	0.0229	0.0310**
$LnY_3\cdot Ln(P_3/P_2)$	0.0016	0.0262	0.9500
_Cons	26.3715	27.6375	0.3400
Mu			
Cons	–6.8326	9.2293	0.4590
Usigma			
Cons	0.6671	1.2450	0.5920
Vsigma			
Cons	–3.5605	0.2791	0.0000
Sigma u	1.395	0.8690	0.1080
Sigma v	0.1685	0.0235	0.0000
Lambda	8.2803	0.8720	0.0000
Log likelihood function	–28.966		
Prob > chi2	0.00000		

Note: ***, **, and * represent the significance levels at 1%, 5%, and 10%, respectively.

This study uses STATA 14 to carry out the estimation based on the maximum likelihood method. Table 4 shows the result of a stochastic frontier estimation. It can be seen that there are two variables that are not included in the estimation process due to multicollinearity problems. Based on the Prob > chi2 value it can be concluded that there is a significance level of 5%, and, therefore there is sufficient evidence to conclude that the parameters used in the model have a significant effect. There is a total of seven variables that can be called significant at different significance levels, namely 5% and 1%.

The sample consists of all commercial banks in the Indonesian banking system. After the screening process, 35 banks are selected as a sample of the study with 27 commercial banks and eight regional banks. Table 5 shows the descriptive statistics of the variables after the winsorizing process, while Table 6 shows the correlation between the efficiency scores and *CIR*. Descriptive statistics shows that *EFF* has an average value of 0.7919 on a scale of 0 to 1. The average value means that the observed sample has an average efficiency level of 0.7919, indicating the 35 banks observed during the observation period have relatively high levels of cost-efficiency. The correlation of efficiency scores calculated was tested using SFA method with *CIR*, as a variable that is widely used by banks to measure operational efficiency. Based on the pairwise correlation in Table 5, it is concluded that there is no strong correlation between the two, indicating that there is a difference in the measurement of efficiency scores and *CIR*.

Table 5. Descriptive statistics of the efficiency model

Variable	Mean	Median	Std. dev	Min	Max	Obs.
EFF	0.7919	0.8423	0.1440	0.1996	0.9595	175
SME	0.1402	0.1228	0.1113	0	0.4636	175
ROAA	0.0119	0.0130	0.0140	–0.0372	0.0328	175
CIR	0.5542	0.5429	0.1709	0.2276	1.0946	175
CAR	0.2161	0.1944	0.1048	0.1348	0.7777	175
REGBANK	0.2571	0	0.4383	0	1	175

Table 6. Pairwise correlation of *EFF* and *CIR*

	EFF	CIR
EFF	1.0000	
CIR	0.0990 (0.1924)	1.0000

Based on the Hausman test, random effect regression was used. In addition, the use of the generalized least squares (GLS) method in the random effect estimation assumed that there are no heteroscedasticity and autocorrelation problems (Brooks, 2014). As Table 6 shows, no multicollinearity problem is indicated in the model. Table 7 presents the estimation results of the efficiency model. The regression result shows that there is a significant positive relationship between the SME lending proportion and cost efficiency of a bank, meaning that an increase

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in the SME lending ratio would increase the efficiency of a bank. The empirical result of this study supports Chih et al. (2008). Referring to the previous studies, the perception of the negative effect of MSME to banks' efficiency lies in the existence of asymmetric information. This will then lead to the risk of moral hazards, as well as transaction and monitoring costs borne by the bank as a creditor (Beck & Demirguc-Kunt, 2006).

Table 7. Efficiency model result

Variable	Coefficient	SE	P>|z|
SME	0.3760	0.1344	0.0050***
ROAA	–1.9591	0.8438	0.0200**
CIR	0.0534	0.0920	0.2805
CAR	0.2748	0.1523	0.0365**
REGBANK	0.0262	0.0504	0.3015
Cons	0.4838	0.0714	0.0000***
N		175	
R^2		0.1113	
Prob > chi2		0.0011	

Note: ***, **, and * represent the significance level at 1%, 5%, and 10%, respectively.

However, the creation of efficiency or inefficiency resulting from lending to MSME consumers depends on many factors. The problem of asymmetric information can be solved by several factors, one of which is relationship lending. Through several dimensions, relationship lending would provide a higher quality of information to banks. One dimension of the relationship lending is duration, as the longevity of the relationship between the debtor and creditor will improve the quality of information exchanges that occur, obtaining sufficient information by observing the history of financial transactions that occur with a particular debtor, which, in turn, will reduce asymmetric information (Rajan & Petersen, 1994). Another dimension of relationship lending is transactions that occur on other products. The debtor may probably become a bank's client in several other products, such as short-term deposits, deposits, and other products. This would increase the level of information quality about the debtor, for example, information about cash flow in the debtor's account. Hence, banks would be able to save costs to overcome the asymmetric information for one particular debtor, resulting in a decrease in inefficiency (Berger et al., 2001; Rajan & Petersen, 1994). From an external perspective, the regulator's active role in encouraging the growth of loans to the MSME sector has helped banks in channeling loans to the MSME sector. The existence of a bureau responsible for storing integrated information related to prospective debtors would ease the screening process, increasing the information quality and helping to avoid moral hazard (Ramcharran, 2017). In the Indonesian context, OJK as a regulator has formed a similar body named *Sistem Layanan Informasi Keuangan* (SLIK). The presence of SLIK then helps the Indonesian banking industry to minimize asymmetric information when conducting credit analysis, which, in turn, will increase efficiency in lending to MSMEs. The existence of a credit guarantee scheme would transfer some of the lending risks to a third party, thus reducing the risk endured by banks. The scheme plays a crucial role in improving banks' efficiency. The existence of a policy that reduces a credit risk significantly allows banks to endure a lower level of risk while achieving the same level of output (Wardhono et al., 2019).

A significant negative relationship is found between profitability and bank efficiency. The result of the study support previous studies conducted by Řepková (2015) and Banna et al. (2017). Higher profitability does not necessarily reflect a higher efficiency. In some cases, high profitability would give an insight into an organization's preference toward risky projects, which offers a higher return. This behavior could result in an inefficiency resulted from the efforts made by a bank's operations in pursuit of higher profitability, reflected in a higher expense resulting from the transaction and monitoring costs that serve as a consequence of the bank's behavior (Zouhaier, 2015). High margins also symbolize higher credit risks and would serve as a cause for banks' inefficiencies (Niţoi & Spulbar, 2015).

According to the result of this study, there was no significant relationship between the cost-income ratio and the bank's efficiency. Burger and Moormann (2008) argued that the cost-income ratio cannot be the right picture to describe the efficiency and productivity of banks due to market conditions, which have a great influence on the determinants of the cost-income ratio.

A significant positive effect is found between the capital adequacy ratio and bank inefficiency. The results support previous studies conducted by Pasiouras and Kosmidou (2007) and Liang et al. (2017). In the case of moral hazard, banks with higher capital adequacy would steer clear of any moral hazard activities because the potential losses incurred would be charged upon the bank's front. It serves as an incentive for banks to avoid any moral hazard activities, thus, improving bank's efficiency. Das and Ghosh (2006) stated that banks with high levels of capital adequacy are perceived as relatively safe and would contribute to a reduction of borrowing costs. A decrease in the cost of borrowing would increase a bank's efficiency (Bernauer & Koubi, 2002).

According to the result of this study, no significant influence of regional banks on bank efficiency was found. Berger and Udell (1995) stated that the existence of relationship lending would increase the level of regional banks' efficiency because of the existence of a financial relationship that makes regional banks have a better ability to obtain higher quality information from their debtors. Even so, this factor largely depends on the bank's ability to administer relationship lending, as no significant difference was found in the efficiency level between commercial banks and regional banks.

CONCLUSION

The purpose of this study is to investigate the impact of MSME lending on the efficiency of banks as there is debate on the impact of MSME lending on bank performance in the context of Indonesian banks. This study also includes profitability, managerial capability, CAR, and regional banks as control variables. As a result, the higher the MSME lending ratio, the higher the efficiency of banks. Therefore, MSME lending by banks does not only play a key role in supporting economic development, as more than 99% of businesses in Indonesia can be classified as MSMEs, but also is beneficial for banks' performance in terms of efficiency. Among the control variables, profitability and CAR have statistically significant relationships with efficiency.

One possible explanation on the positive relationship between MSME lending and bank efficiency is the existence of relationship lending, a bureau that integrates debtors' information, and a credit guarantee scheme in the Indonesian banking system, which aims to support banks in providing credits to MSMEs. The result also suggests that government policies to ease MSME loans will play a significant role in making a bank choose to channel MSME loans. Policies to increase SME lending in the form of incentives, risk-reduction, and efforts to minimize asymmetric information have proven to be critical to improving a bank's efficiency, increasing banks' preference to disburse loans to the MSME sector. From the bank's point of view, asymmetric information problems can be solved by applying the relationship lending principle in various dimensions.

It should be noted that this study has some limitations. The most crucial of these is the limited accessibility to the required data. The SFA method is very sensitive to the lack of data, which significantly reduces the quality of the estimation. As a result, the sample size has been reduced. In addition, other external factors affect the result of this study. The tendency of banks to disburse MSME loans largely depends on a bank's business strategy. Banks that choose the MSME sector as their primary target will tend to have a higher proportion of MSME loans. However, it was not possible to define banks that have chosen the MSME sector as their primary target due to its arbitrary status as it is prone to bias.

Another crucial limitation of the study is the estimation of the efficiency model. The dependent variable estimated using the SFA method is performed on a quadratic cost function model. The efficiency score was then used as a dependent variable for the efficiency model in the form of a linear regression model, establishing a risk that the estimated results obtained would be less accurate. There is a possibility that there are other estimation techniques that can provide a more robust explanation for the model, such as a quadratic regression model.

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