"Determinants of MSMES' credit access: Evidence from Indonesian banks"

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DETERMINANTS OF MSMEs' CREDIT ACCESS: EVIDENCE FROM INDONESIAN BANKS

Abstract

Credit is an important component in developing micro, small, and medium enterprises (MSMEs), as it can boost a country's economy, help boost the production capacity of MSMEs, create jobs, and reduce poverty. This study aims to examine the characteristics of banks in Indonesia that influence lending to micro, small, and medium enterprises by adopting agency theory that explains the relationship between lenders (banks) and borrowers (MSMEs) as agents and principals. Data were taken from quarterly financial reports of banks in Indonesia. There are 42 sample banks from 2010 to 2022, so the data used are 2,182 observations. Data analysis uses a fixed effect model with robust standard errors. The results show that operating costs do not influence credit access for MSMEs or medium-sized enterprises. Bank stability has an impact on increasing MSME credit access. High bank capital also increases MSME credit access. Robustness tests were also conducted using the general method of moments. The results were consistent with the main model. The implication is that cost management theory and credit decision-making need to consider differences in business scale. The results also further strengthen the argument that bank stability is an important factor that can improve access to credit for small and medium enterprises.

Keywords	lending, MSMEs, bank cost, bank capital, bank stability, financial inclusion
JEL Classification	G21, G23

INTRODUCTION

Micro, small and medium enterprises (MSMEs) play a crucial role in the economy, especially in creating jobs and driving economic growth. However, difficulties in gaining access to credit are often a major obstacle for MSMEs (Ahmad, 2012). Access to credit plays a significant role in developing MSMEs in Indonesia. The growth of MSMEs is important for the overall economy and significantly impacts creating jobs, reducing poverty, and improving people's welfare. Access to credit enables MSMEs to increase production and expand their business (Wasiuzzaman et al., 2020). By securing additional funds from credit, MSMEs can invest in the necessary machinery, equipment and infrastructure to increase their production capacity. This can not only improve efficiency and productivity but also help MSMEs to meet the growing market demand. Access to credit enables MSMEs to develop product innovation and diversification (Amadasun & Mutezo, 2022).

MSMEs with access to additional funds can undertake research and development to create new, more innovative and diverse products or services. This helps MSMEs to remain competitive in an increasingly tight market and increases the added value of their business (Amadasun & Mutezo, 2022; Wasiuzzaman, 2019). In addition, access to credit also allows MSMEs to improve the quality and standard of their products. By securing funds from the credit, MSMEs can invest in employee training, improve the quality of raw materials, and imple-

ment better management systems (Agarwal et al., 2023; Endris & Kassegn, 2022). This can help MSMEs meet higher standards in both domestic and international markets. MSMEs can undertake more aggressive marketing and promotional efforts and expand into new markets (Wasiuzzaman, 2019). Access to credit helps MSMEs to overcome liquidity issues and address working capital needs (Wang et al., 2023). MSMEs often face challenges meeting day-to-day operational costs, such as salary payments, raw material purchases, and debt repayments. Access to credit can provide a quick and timely solution to address these liquidity issues.

This study fills the research gap that has not found bank operating costs to impact MSME credit access. The condition of banks with high operating costs tends to encourage banks to increase lending rates, which can reduce MSME credit access. By examining this relationship, this research contributes valuable insights that can inform policy decisions and enhance the financial landscape for MSMEs in Indonesia. Furthermore, understanding the dynamics between bank characteristics and lending practices can lead to the development of targeted strategies aimed at improving credit accessibility for MSMEs. Ultimately, these findings can help foster a more inclusive financial environment that supports the growth and sustainability of MSMEs, which are vital to Indonesia's economic development.

1. LITERATURE REVIEW AND HYPOTHESES

One of the most important factors banks consider when providing financial support to micro, small, and medium enterprises is adopting agency theory. This allows banks to ensure that the lending process is carried out in a controlled and efficient manner. The concept of agency theory adopted in this study explains the relationship between lenders (banks) and borrowers (MSMEs) as agents and principals (Zhang et al., 2024). In the context of credit access, banks act as principals who provide funds to MSMEs as agents. The theory highlights the monitoring and separation of interests between the two parties. Banks need to ensure that MSMEs use the loan funds efficiently and can repay the loan (Zhang et al., 2024). Therefore, banks may implement various monitoring mechanisms and incentives to ensure MSMEs' compliance with loan agreements. Banks want to ensure the loaned funds are utilized efficiently and can be repaid on schedule. However, banks face agent problems relating to moral hazard and adverse selection (Iqbal & Rao, 2023). To address this issue, the bank uses monitoring mechanisms, such as financial audits and periodic financial reports, and applies strict credit terms to minimize risk. Agency theory helps banks run their lending operations in a more controlled and efficient manner for micro, small, and medium enterprises. By applying this theory, financial institutions can identify and address potential problems, such as adverse selection

and moral hazard, that will prevent them from lending in a risky manner.

Within the agency theory framework, the role of banks in reducing operational costs impacts banks' ability to extend credit. High costs in monitoring, controlling, and managing risks can reduce banks' ability and willingness to lend to MSMEs. Therefore, banks must develop strategies to efficiently manage operational costs, ensure proper incentives, and reduce agency risk to improve access to credit for MSMEs (Adhikary et al., 2021). The assumption is that high operating costs tend to push banks to raise lending rates or set stricter terms for borrowers, including MSMEs. Banks facing high operating costs will look for ways to optimize their revenues, and increasing interest rates or tightening credit terms are ways to offset high operating costs (López-Penabad et al., 2022). The ability of banks to run their operations efficiently can increase access to credit for MSMEs at low cost. Bank cost efficiency is an essential factor that determines the level of bank competition. Efficient operating costs can lower lending rates, making credit cheaper for micro, small, and medium enterprises. This can help improve financial accessibility and stability and support the growth of various economic sectors, such as micro, small, and medium enterprises.

Efficiency in bank operations allows banks to allocate more resources to carry out risk management tasks, such as analyzing and monitoring

credit quality and assessing borrowers. By minimizing unnecessary expenses, financial institutions can focus on improving borrower risk assessment, improving credit quality, and meeting regulatory requirements. This helps banks identify potential credit risks earlier and allows them to quickly take the necessary corrective actions, which directly benefits the bank's credit portfolio and financial stability. Banks tend to be more cautious in lending to MSMEs as they seek to mitigate financial risks that may arise due to high operational costs (Drechsler et al., 2023; Saifurrahman & Kassim, 2023). This can have a negative impact on the growth of MSMEs as they will find it difficult to gain access to the capital needed to expand their businesses. In addition, high operating costs tend to push banks to raise lending rates, which in turn can reduce MSMEs' purchasing power for credit (Le & Ngo, 2020). In practice, bank operating costs include various aspects, such as administrative costs, lending costs, risk management costs, and other overhead costs. Banks with high operating costs tend to allocate these costs to borrowers through higher interest rates (Mbowe et al., 2020; Priyadi et al., 2021). This is especially true for small-capitalized banks, which charge higher fees than large-capitalized banks (Hubbard et al., 2022). This makes MSMEs, which generally have limited access to financial resources, less able to afford loans with much higher interest rates. As a result, MSMEs often need help securing credit from banks, especially as high interest rates can make the credit repayment burden unaffordable. In the long run, this can hinder the growth and development of MSMEs and reduce their contribution to the overall economy. In addition, high operating costs may also encourage banks to focus on more profitable market segments, such as corporate loans, rather than giving adequate attention to MSMEs. As a result, MSMEs may be neglected or given lower priority in terms of servicing and funding, which may hinder the overall growth of the MSME sector.

On the other hand, banking stability is a crucial factor that affects the conditions and availability of credit for MSMEs. Banking stability can ensure that credit will be available for micro, small, and medium enterprises (MSMEs). Bank stability also contributes to overall financial system stability, facilitating inclusive economic growth and healthy development. The financial stability of banks plays an important role in determining the availability and conditions of credit offered to MSMEs (Ismanto et al., 2023). This is because various factors, such as the lending infrastructure and technology used by banks, affect the credit standing of these entities. Banks with a robust financial framework offer fair terms and competitive interest rates to help small and medium enterprises (SMEs) obtain the necessary funds. In addition, this creates trust among regulators, borrowers, and investors, which is critical to maintaining banks' financial operations and promoting sustainable economic growth (Ogujiuba et al., 2004).

Banks' reluctance to lend to MSMEs is a critical issue that needs to be resolved. Some policies propose establishing equity investment funds for small and medium enterprises. The situation will only improve if banks have strong and stable funding capabilities. Stable banks with strong capitalization and risk management, better positioned tend to have greater ability to lend at lower interest rates (Borio & Gambacorta, 2017), which in turn can increase access to credit for MSMEs. However, prolonged low interest rates will depress banks' interest income, especially banks that lack product diversification, reducing bank profits. Bank stability refers to the ability of a financial institution to continue to operate properly and fulfil its obligations, especially in the face of unstable economic situations or financial turmoil. More specifically, bank stability includes the bank's ability to maintain sufficient capital, manage risk well, and have adequate liquidity.

A stable bank will have sufficient capital to lend and address possible credit risks. Bank instability, often caused by tightening regulations, can lead to tightening credit (Fratzscher et al., 2016), so that MSMEs will find it challenging to obtain the loans needed for their day-to-day operations or to expand their businesses. This can be exacerbated by factors such as asset quality deterioration, inaccurate estimates of company quality, and conservative lending approaches (Martins, 2010). In addition, bank instability may also lead to increased lending rates, exacerbating the financial burden on already vulnerable MSMEs. The severity of the contraction in credit supply is particularly pronounced for credit-constrained firms but

can be mitigated by the presence of collateral and a diversified portfolio of lenders. Therefore, bank stability is critical to ensure smooth MSME access to affordable and sustainable credit. This contributes to the growth of the MSME sector, which impacts overall economic growth, creates jobs, and improves people's welfare. Based on the theoretical framework review, we hypothesize that Bank stability will improve MSME credit access.

The next determinant of credit access is bank capital. Bank capital is the capital owned by the bank to extend credit. Banks rely on capital to provide credit to their customers as a form of funding (Li et al., 2024). Well-capitalized institutions will lend to bank-dependent firms, thus minimizing the impact of financial shocks on the economy. However, the level of capital that banks hold on their balance sheets can also affect lending dynamics. For example, a capital increase may lead to decreased lending levels. This factor is very important in the regulation of bank capital. It can affect credit availability (Thi Nguyen et al., 2024).

Adequate capital levels can enhance a bank's ability to provide credit, while low capital levels can limit credit availability to MSMEs. Bank capital consists of two types, namely core capital and supplementary capital. Core capital includes share capital, designated reserves, and retained earnings. Meanwhile, additional capital includes general reserves, subordinated debt, and financial instruments convertible into shares (De Jonghe et al., 2020). Sufficient bank capital is essential to maintain the financial stability of banks. Substantial bank capital provides financial assurance to banks so they feel more comfortable facing credit risk (Li et al., 2024; Thi Nguyen et al., 2024). Well-capitalized banks tend to be better equipped to lend to MSMEs at more competitive interest rates and more flexible terms. This increases MSMEs' access to credit needed to finance their operations, expand their businesses, or improve productivity.

Banks with strong capital have more funds available to disburse as loans (Berrospide & Edge, 2024). This is important for MSMEs that often need additional capital to expand their business, update equipment, or face unexpected business challenges. As such, sufficient bank capital can help improve MSMEs' access to credit needed for their

business growth and development. However, several aspects need to be considered, one of which is that strong bank capital does not always guarantee that banks will provide credit to MSMEs directly (Wibowo & Aumeboonsuke, 2020). Factors such as unstable economic conditions, banking regulations, or internal bank policies can also influence banks' lending policies to MSMEs. In addition, banks' internal resources must also be well managed to ensure that funds can be channeled as loans to MSMEs in an efficient and sustainable.

A well-capitalized bank will have more funds to disburse as loans to MSMEs for working capital and investment in business development. Thus, well-capitalized banks can potentially increase MSMEs' access to credit needed for their business growth and development. So, this study aims to examine the characteristics of banks in Indonesia that influence lending to micro, small, and medium enterprises (MSMEs). For this reason, this study suggests the following hypothesis:

H1: *Bank operating costs reduce MSME access to credit.*

H2: *Bank capital improves MSME credit access.*

2. METHODOLOGY

This study employs a quantitative approach with panel data regression analysis to examine the influence of specific bank factors and macroeconomic variables on SME credit access in Indonesia. This approach was chosen because panel data allows for a deeper analysis by observing the behavior of banks across different time periods, resulting in more robust and reliable research findings.

The data used in this study are derived from two main categories. The specific bank data include financial variables obtained from the quarterly financial statements of banks listed on the Indonesia Stock Exchange (IDX) during the period of 2010 to 2022. These variables include operational costs, bank stability, bank capital, and other control variables such as bank size (SIZE), leverage (LEV), Provision for loan loss (PLL), and Deposit Fee (DF). The macroeconomic data were obtained from publicly available databases from Indonesia's

Central Bureau of Statistics (BPS). The macroeconomic variables used in this study include inflation (INF) and gross domestic product (GDP).

The population of this study consists of all public banks listed on the IDX during the research period. The sample was selected purposively, including all banks listed on the IDX from 2010 to 2022. Therefore, this study employs a saturated sample, where all elements of the population that meet the inclusion criteria are included in the research. The total sample consists of 42 banks with 2,182 quarterly observations. This study uses a panel data regression model to analyze the relationships between the research variables. The basic model used is:

$$MSMEAC_{it} = \beta_0 + \beta_1 OC_{it} \atop + \beta_2 Zscore_{it} + \beta_3 CAP_{it} + \varepsilon_{it}, \tag{1}$$

where i is the bank; t denotes the time subscript; β_0 adalah intercept; $\beta_1, \beta_2, \beta_3$ are the coefficients of each explanatory variable; OC is operating cost; $Zscore$ is bank stability; CAP is bank capital; $\delta BANK$ is a vector of bank specification control variables ($SIZE$, LEV, CAP, CTI, LLP, and FC); $\gamma MAKRO$ is a vector of macroeconomic control variables (INF and GDP), and ε is the standard error.

The dependent variable in this study is SME credit access, defined as the total amount of loans provided by banks to SMEs. This variable is measured using the natural logarithm of the total credit granted to SMEs (Aysan & Disli, 2019; Beck &

Demirguc-Kunt, 2006; Erdogan, 2018). The main explanatory variables of this study include bank operating costs, measured as a percentage of total bank assets. This variable reflects the operational efficiency of banks and is predicted to have a negative effect on SME credit access (Dietrich & Wanzenried, 2014; Phan et al., 2020). Bank stability, measured by the Z-score, is calculated using a formula that incorporates return on assets (ROA), the capital-to-asset ratio, and the standard deviation of ROA. A higher Z-score indicates a lower risk of bankruptcy (Albaity et al., 2019; Fu et al., 2014; Goetz, 2018; S. Kasman & A. Kasman, 2015). Another key variable is bank capital, measured as the equity-to-total assets ratio. This variable represents a bank's capital capacity to absorb risk and is predicted to positively influence SME credit access (Abbas et al., 2019; Goetz, 2018; Mehran & Thakor, 2011).

3. RESULTS AND DISCUSSION

Table 2 presents a summary of descriptive statistics related to the instruments used in this research model. The table provides information regarding the number of observations of 2,182 bank-years. MSME credit access is measured using the amount of credit disbursed by banks to MSMEs, which is an average of 282,497 billion rupiahs. Macroeconomic factors measured by inflation and economic growth show that inflation in Indonesia averaged 4.31 percent from 2010 to 2022.

Table 1. Variable description and measurement

Variable	Description	Proxy
MSME credit access (Access MSME)	A number of loans provided by banks for MSMEs	Natural logarithm of the number of bank loans to MSMEs
Operating cost (OC)	Implies bank efficiency	The ratio of operating expenses to total bank income
Bank Stability (ZScore)	A bank's financial condition	Z-score is the ratio of the sum of the return on assets (ROA) and capital to assets (CA) ratios to the standard deviation of the return on assets ratio
Capital bank (Cap)	The proportion of capital to total assets held by the bank	The ratio of total equity to total bank assets
Bank Size (Size)	Value of bank assets	Natural logarithm of total bank assets
Leverage (Lev)	The proportion of liabilities incurred by the bank over its total assets	The ratio of total liabilities to total assets of the bank
Provision for loan loss (PLL)	Reserve to cover potential loan defaults	Comparison of allowance for loan losses and total interest income
Deposit Fee (DF)	The risk that the bank accepts from deposits	Interest expense to total deposits ratio
Inflation (Inf)	Annual inflation rate	Annual inflation rate
GDP Growth (GDP)	Annual real GDP growth rate	Comparison of the difference between the GDP of this year (t) and the previous year ($t-1$) with the GDP of the previous year ($t-1$)

Table 2. Descriptive statistics of each industry

Variable	N	Mean	Std. Dev.	Min	Max
Access MSME (Billion Rp)	2,182	282,497	115,142	30,244	824,580
Operating Cost (OC)	2,182	0.4996	0.7518	0.0094	24.6755
Z-Score	2,182	2.0528	2.2896	−7.0995	10.8098
Capital (Cap)	2,182	0.1782	0.1379	0.0105	2.2830
Size (Billion Rp)	2,182	112,263	236,576	63.637	1,750,995
LnSize	2,182	16.8702	1.9952	11.0609	21.2834
Leverage (Lev)	2,182	0.8379	0.1991	0.1084	1.6693
Provision for loan loss (PLL)	2,182	0.4949	1.1012	0.0007	25.9496
Deposit Fee (DF)	2,182	0.1469	5.1103	0.000002	248.6471
Inflation (Inf)	2,182	4.31	1.89	1.33	8.40
GDP Grwoth (GDP)	2,182	4.71	2.36	−5.32	7.08

Table 3. Correlation matrix between variables

Variable	Access MSME	OC	Z-Score	Cap	LnSize	Lev	PLL	DF	Inf	GDP
Access MSME	1.0000	−	−	−	−	−	−	−	−	−
OC	0.0317	1.0000	−	−	−	−	−	−	−	−
Z-Score	0.0713	−0.1478	1.0000	−	−	−	−	−	−	−
Cap	0.0818	0.1961	−0.0944	1.0000	−	−	−	−	−	−
LnSize	0.264	−0.0949	0.5226	−0.3862	1.0000	−	−	−	−	−
Lev	−0.0866	−0.1949	0.0905	−0.5098	0.3391	1.0000	−	−	−	−
PLL	0.1564	0.0796	−0.0447	0.0109	0.1985	−0.0215	1.0000	−	−	−
DF	−0.0742	−0.0016	−0.2498	−0.0264	−0.2236	0.0165	−0.1622	1.0000	−	−
Inf	−0.2709	−0.0286	0.1108	−0.0612	−0.1432	0.0671	−0.1927	0.06	1.0000	−
GDP	−0.2247	0.0131	0.128	−0.0615	−0.1789	0.0639	−0.106	−0.0161	0.3079	1.0000

Meanwhile, Indonesia's economic growth over the same period averaged 4.71 percent.

Table 3 illustrates the correlation matrix that can be used to determine the magnitude of the relationship between the variables and the co-movement. In the end, the correlation matrix value of each variable shows no correlation of each research variable. A fixed effect model with robust standard errors was used to see the effect of operating cost, bank stability, and bank capital on MSME access. Using equation one to test the hypothesis. The results are shown in Table 4, column one (1), which shows that operating costs do not influence MSME credit access. Meanwhile, bank stability and bank capital are proven to have a positive influence on MSME credit access.

3.1. Hypotheses testing results

The study's main result in Table 4 shows that operating costs do not influence MSME credit access. This suggests that banks in Indonesia can manage their operating costs without affecting their credit policies. In addition, they may have high operational effectiveness. This allows banks to pass on any increase in operating costs to their customers without raising lending rates or tightening terms to MSMEs. In addition, banks have now developed a lot of non-interest income diversification so that banks can continue to provide loans without relying too much on operating costs (Cornelli et al., 2024). Based on the theory of competition, banks that possess business intelligence technology enable productive entities to generate superior margins compared to their market rivals. The bank can offer better options at cheaper prices and ensure a competitive advantage (Rahman, 2023). The development of financial technology in bank operations has also improved the efficiency of bank operations, as customers have been conducting many transactions independently. The increased utilization of financial technology has encouraged banks to extend credit access to traditionally underserved customers (Tian et al., 2024). Using

AI in credit analysis and digital banking services can reduce operational costs so that banks can continue providing credit to MSMEs with competitive terms.

In addition to internal banking factors, Indonesian government regulations that incentivize MSMEs encourage banks to channel people's business loans. The government assigns banks to guarantee lending to MSMEs with interest subsidies set by the government to support the development of MSMEs. This can help reduce the negative impact of bank operating costs. In addition, banks in Indonesia also have programs to support micro, small and medium enterprises as part of their commitment to financial inclusion. This shows they are willing to do whatever it takes to help these businesses grow. Big banks in Indonesia, apart from assisting with the distribution of people's business loans, also provide mentoring support so that MSMEs can develop by establishing business mentoring services for credit recipients; the hope is that MSMEs can develop and repay their loans smoothly. So that banks do not depend much on operating costs to lend to MSMEs. In contrast, Guiso et al. (2006) show that higher credit costs are found in areas where access to credit is restricted and access to credit is lower. While these restrictions positively impact the number of bad debts, they also lead to an overall decrease in credit availability.

Table 4. Effect of operating cost, bank stability, and bank capital on MSME credit access (FEM robust)

Variable	Access MSME (1)	Access MSME (2)
OC	−1174.8	−2553.4
	(−0.47)	(−0.67)
Z-Score	27.68***	10.97***
	(6.82)	(0.72)
Cap	34234.5***	110559.5***
	(3.08)	(2.65)
LnSiza	–	9730.5***
		(6.80)
Lev	–	4817.6
		(0.12)
PLL	–	3139.5
		(1.04)
DF	–	48187.3
		(1.14)
Inf	–	−11867.2***
		(−3.46)
GDP	–	−1208.8**
		(−2.19)
_cons	259301.7***	169730.5***
	(64.66)	(3.44)
N	2,182	2,182
F	38.91	169.86
Prob > F	0.0000	0.0000
R-squared	0.0077	0.1550

Note: ***, **, and * denote statistically significant variables at 1%, 5% and 10% levels, respectively; t statistics in parentheses.

The second hypothesis test results show that bank stability has a significant positive effect on MSME credit access. This suggests that stable banks have a greater capacity to disburse credit with lower risk. Stable banks have the necessary capital, liquidity and risk management to lend efficiently to their customers (Vučinić, 2020). This helps them create trust among depositors and other borrowers, such as micro, small and medium enterprises (MSMEs). They also tend to lower their funding costs, which makes them more competitive in lending. The technological systems used by stable banks allow them to assess the risks associated with lending to MSMEs thoroughly. This increases the likelihood that MSMEs can access credit with reasonable repayment terms.

Banking stability is an essential factor affecting the development and operation of financial services. Although universal banks can provide customers with a wide range of financial services, their ability to maintain a stable financial environment may be affected by the expansion of credit lines (Wagner, 2007). Despite efforts to maintain the financial system's stability with various banking regulations, there can still be unintended consequences. For example, increased liquidity may lead to an increase in banks' risk-taking activities. This can be detrimental to the financial stability of the bank. The findings of this study suggest that banks should consider various factors that influence the operation and development of credit products and services.

The stability of bank operations can help banks develop new credit products and services to benefit customers (Santomero, 2002). This can help improve access to and management of credit for

small and medium enterprises. It can also create a more favourable environment for the growth of these businesses by increasing their confidence in the availability of credit. In addition, the government and regulators will provide various incentives and support to stable banks. This can include access to credit guarantee schemes and interest subsidies, which make it easier for them to lend to small and medium-sized enterprises (SMEs). High-stability banks can also provide various services and programmes designed to help small and medium-sized enterprises (SMEs) grow. These services include training programmes, technical assistance, and business consulting. These services can help improve the operations of these organisations and increase their loan repayment success rates.

Table 4 shows that bank capital has a significant positive effect on credit access. This suggests that a well-capitalized bank can provide more credit to its customers, especially those considered risky, such as MSMEs. Substantial capital also increases the confidence of depositors and investors, which can help

improve bank liquidity and expand the bank's ability to extend credit (Phan Thi Hang, 2023). In addition to being able to comply with regulations set by the financial services authority, well-capitalized banks can also offer more innovative and diverse credit products to the MSME sector. In addition, well-capitalized banks will be able to develop and implement risk management systems that can help them identify and manage their credit risks, resulting in higher loan repayment success rates. Banks with strong capital can also expand their lending capacity to support financial inclusion and growth.

Capital is considered the most important factor affecting credit growth, and this relationship is non-linear (Rappoport, 2016). This positive impact can also be seen in the case of small businesses, as their capital structure affects their access to credit (Chisasa, 2019). Sufficient capital can help banks expand their loan base and absorb potential losses. This can increase market confidence in the bank's solvency and stability, and this can help improve the bank's liquidity (Cho & Kim, 2016). In times of mar-

Table 5. Influence of operating cost, bank stability, and bank capital on MSME credit access in business scale (FEM robust)

Variable	Access micro	Access micro	Access small	Access small	Access medium	Access medium
	(1)	(2)	(3)	(4)	(5)	(6)
OC	3511.8	1604.1***	3128.2	1271.2***	−7713.6	−5175.1
	(1.42)	(3.79)	(1.53)	(3.09)	(−1.18)	(−1.16)
Z-Score	20.155***	3.958***	19.052***	−11.539***	58.58***	0.6126
	(8.93)	(4.17)	(10.01)	(−10.13)	(5.70)	(0.35)
Cap	−34944.27***	51420.9***	−26273.7***	52596.7***	94362.9***	9948.1
	(−4.76)	(4.55)	(−4.20)	(4.76)	(8.60)	(0.86)
LnSiza	–	9311.8***	–	8692.8***	–	−7259.2***
		(8.15)		(8.85)		(−9.44)
Lev	–	19747.8**	–	16857.6*	–	−37347.9***
		(2.18)		(1.86)		(−3.68)
PLL	–	6210.1***	–	5159.1***	–	−7829.4**
		(−0.04)		(3.39)		(−2.28)
DF	–	22683.4**	–	20819.1**	–	−2184.9
		(2.56)		(2.53)		(−0.13)
Inf	–	−272.95	–	−2271.7	–	−9040.5***
		(−0.26)		(−1.54)		(−4.00)
GDP	–	495.6**	–	589.5	–	−2268.5***
		(2.09)		(1.56)		(−5.33)
_cons	22146.14***	−160781.5***	50069.12***	−112732.2***	187597.2***	431398.2***
	(10.68)	(−6.30)	(27.07)	(−5.28)	(61.37)	(20.91)
N	2,182	2,182	2,182	2,182	2,182	2,182
F	42.07	174.50	55.60	248.17	70.31	639.10
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-squared	0.0631	0.1790	0.0463	0.1677	0.0738	0.2571

Note: ***, **, and * denote statistically significant variables at 1%, 5% and 10% levels, respectively; t statistics in parentheses.

Table 6. Effect of operating cost, bank stability, and bank capital on MSME credit access (GMM)

Variable	Access MSME (1)	Access MSME (2)
L.accesmsme	0.644***	0.549***
	(36.55)	(29.12)
OC	−626.66	−816.61
	(−0.89)	(−1.60)
ZSCORE	57.80***	26.08**
	(7.44)	(2.31)
CAP	212893.9***	369.9
	(5.3)	(0.01)
LnSIZE	−	39606.4***
		(9.18)
LAV	−	−27109.9
		(−0.72)
LLP	−	1604.4
		(0.67)
FC	−	63874.6
		(1.55)
INF	−	−2194.4***
		(−2.76)
GDP	−	−65.26
		(−0.46)
_cons	130003.2***	−509495.4***
	(10.64)	(−5.75)
N	2,182	2,182
Wald chi2	2108.11	2562.62
Prob > chi2	0.0000	0.0000
Sargan Test	0.067	0.173

Note: ***, **, and * denote statistically significant variables at 1%, 5% and 10% levels, respectively, t statistics in parentheses.

ket stress, capital can play an essential role in helping firms through the crisis by providing a buffer against unexpected shocks (Khan et al., 2023). This is why banks need to maintain an adequate capital base. Having sufficient capital also helps protect the financial system and the bank itself from potential risks. This increases customer and investor confidence and reduces the likelihood of a crisis spreading.

Table 5 of this study disaggregates credit access based on the scale of the borrower's business. The results show data that are different from the main results, where operating cost positively influences micro and small business borrowers when tested with control variables. However, the results are consistent with the main test for medium-sized business borrowers, where operating cost is not shown to influence credit access. Bank stability results are also consis-

tent with the main results, which show that bank stability can increase access to credit for borrowers of all sizes. Consistent results are also seen from capital banks, where capital banks can increase access to bank credit for businesses of all sizes.

The robustness of the model is tested using the general method of moments (GMM). GMM was chosen to avoid the endogeneity of the explanatory variables that may be correlated with the error term in the model, which may lead to biased and inconsistent parameter estimates. The results show that the main variables in the study are consistent with the main results. Table 6 shows that operating cost consistently does not affect MSME credit access, while the test results of bank stability and bank capital affect MSME credit access, which is consistent with the test in the main model.

CONCLUSION

This study examines the influence of operating costs, bank stability, and capital on MSMEs' credit access. The results show that operating costs do not influence credit access for MSMEs or medium-sized businesses. However, the results are different for micro and small business borrowers where high operating costs encourage banks to provide more credit to them. The results of bank stability are also consistent in MSME credit access overall and in terms of business scale, where bank stability has the ability to increase MSME credit access. The test results on bank capital also have consistent results for MSME credit access, where high bank capital can stimulate MSME credit access. The results imply that the theory of cost management and credit decision-making needs to consider differences in business scale. In addition, these findings support the theory of banking and financial stability, which states that institutions with stable operations can provide more stable funding to support the needs of their customers.

AUTHOR CONTRIBUTIONS

Conceptualization: Hadi Ismanto, Atmaji, Endang Suhari.
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Supervision: Hadi Ismanto, Atmaji, Endang Suhari.
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