



The Effect of The Reference Rate (BI-Rate) on Micro, Small, and Medium Enterprise (MSME) Lending For The Period 2016-2023

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ABSTRACT

This study identifies the impact of the Bank Indonesia reference rate (BI-Rate) on MSME lending, amid the significant challenges experienced by MSMEs due to the Covid-19 pandemic and the importance of sustaining MSME growth, as MSMEs are the largest contributors to Indonesia's economic growth. The research employs a panel data regression model with the system Generalized Method of Moment (Sys-GMM) estimation method and aims to determine the effect of the BI-Rate on MSME credit from the second quarter of 2016 to the fourth quarter of 2023. The data used includes individual bank financial statements and macroeconomic variables. The findings reveal that the BI-Rate has a significant negative impact on MSME lending. Every increase in the BI-Rate leads to a decrease in MSME credit disbursement, and vice versa. This research enhances our understanding of the importance of effective monetary instruments in maintaining financial and monetary stability. Additionally, it highlights that banks are less responsive to changes in the BI-Rate, which could be attributed to asymmetric information, an issue that requires special attention from the government and central bank.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) in Indonesia play a significant role in the economy, making it a priority for the government to ensure that MSMEs remain active and operate efficiently. During the economic impact of the Covid-19 pandemic, policies were implemented involving various stakeholders and can generally be categorized into four main types: fiscal policy, monetary policy, macroprudential policy, and emergency liquidity measures (Suksmonohadi & Indira, 2020).

The role of Bank Indonesia, as the central bank of the Republic of Indonesia, includes the implementation of both monetary and macroprudential policies. Monetary policy is closely tied

to the central bank's reference rate, which serves as an instrument to execute monetary operations aimed at influencing the real sector, such as MSMEs. Literature on monetary policy typically distinguishes between two types: expansionary and contractionary. Expansionary monetary policy seeks to stimulate economic activity by increasing the money supply, while contractionary policy works in the opposite direction. Monetary expansion or contraction can result in fluctuations in domestic interest rates (Juhro, 2020). It is recognized that the effect of monetary policy does not immediately impact loan interest rates in the financial sector, as loan rates tend to adjust more slowly than deposit rates. Moreover, information regarding monetary easing or interest rate cuts is generally communicated to customers more rapidly than information about rate hikes. This delay can hinder the immediate effectiveness of central bank policies.

Ensuring that MSMEs remain active and efficient is a key concern for the government. Through fiscal policy, the government can regulate state expenditures, while the central bank aims to maintain currency stability, reflected in stable prices for goods and services and a well-maintained Rupiah exchange rate.

During the pandemic, the central bank tended to lower the reference rate to around 3.5%. Keeping the interest rate low was intended to sustain economic growth in Indonesia. It was expected that the reduction in the reference rate would lead to lower loan rates, thereby stimulating both consumption and investment.

This study aims to determine whether the BI-Rate influences the distribution of MSME credit. As a reference, the research will refer to a study by Anwar, Suhendra, Didu, et al. (2023). That study used a sample of 41 commercial banks listed on the Indonesia Stock Exchange from January 2010 to December 2022. Using dynamic GMM estimations, the results showed that the central bank's reference rate had a significant negative effect on the distribution of consumption, working capital, and investment loans.

The research gap compared to the aforementioned study lies in the time frame, which in this study focuses solely on the period from 2016 to 2023, when the BI-7DRR was established as the reference rate. Additionally, this study focuses exclusively on MSME loans and introduces a Covid-19 dummy variable to account for the pandemic's potential impact on the relationship between the BI-Rate and MSME credit. The study also uses a sample of 106 general banks in Indonesia to provide a broader understanding of bank behavior.

LITERATURE REVIEW

The central bank, through its monetary policy, aims to achieve Rupiah stability, which is reflected in low and stable inflation levels, with the reference rate (BI-Rate) serving as the primary instrument. The transmission of monetary policy through the interest rate channel is evident in how the BI-Rate influences bank deposit and lending rates (Bank Indonesia, n.d.). During monetary contraction, where the BI-Rate increases, bank interest rates for both savings and loans will also rise. This leads to an influx of public funds into banks as savings, increasing the supply of loanable funds, while the demand for loans decreases due to the higher potential cost of loan interest.

However, different dynamics may occur in sluggish economic conditions. The rise and fall of the central bank's reference rate do not always prompt a swift response from banks. There is often a time lag (the time required) in the transmission of monetary policy.

In the credit market, banks' lending behavior is influenced by factors such as wealth effects, risk preferences (willingness to take risks), and the risks associated with issuing new loans. Asymmetric information also poses a challenge in granting new loans, as banks tend to retain competent customers and are unlikely to sell the credit portfolio of such customers unless the bank itself is in a precarious situation. Banks will sell credit portfolios only when the borrowers are high-risk, which may not be apparent to other banks (Stiglitz & Greenwald, 2003).

Consequently, credit disbursement is often constrained due to asymmetric information, compelling banks to exercise greater caution in lending.

Empirical analysis has demonstrated that investment credit and interest rates, through the role of MSMEs, have a positive and significant impact on Indonesia's economic growth (Muliadi et al., 2020). Given this systemic impact, maintaining the sustainability of MSMEs is crucial. Support from various stakeholders, especially the government, is essential. Access to financing is a critical factor for the growth and sustainability of MSMEs, with the central bank's reference rate serving as a key component influencing this access.

Previous studies indicate that the central bank's reference rate influences the demand and supply of credit. Changes in lending rates impact credit costs, leading to either an increase or a decrease in credit growth. An increase in the policy interest rate by the central bank reduces lending, while a decrease expands it (Naiborhu, 2020). The bank lending or credit channel is critical for monetary policy in a bank-based system. Contractionary monetary policy negatively impacts financial intermediation through undisbursed loans. Conversely, expansionary monetary policy effectively reduces undisbursed loans (Soedarmono et al., 2023).

An increase in reference rate leads to higher lending rates for borrowers, particularly for MSME loans, which are considered riskier. This results in a decline in credit demand. Similarly, a study on 41 banks listed on the Indonesia Stock Exchange (Anwar et al., 2023) found that the reference rate has a significant negative effect on investment loans, working capital loans, and consumption loans. Low reference rates can also alleviate financial difficulties for MSMEs in Southern Europe, as every 0.5% reduction in interest rates increases credit demand by up to 5% (Martínez & Sánchez, 2020). Research on Southeast Asian countries, particularly in the trade sector, highlights that every decrease in the reference rate improves MSME credit accessibility (Lee & Tan, 2021).

To examine the response of MSME credit to changes in the BI-Rate, the principle of elasticity is applied, which states:

$$E = \frac{\Delta Y}{\Delta X} \times \frac{\bar{X}}{\bar{Y}}$$

where Y represents the dependent variable, X represents the independent variable, and $\frac{\Delta Y}{\Delta X}$

denotes the partial derivative of Y with respect to X. In this study, MSME credit by business scale and bank group will serve as the dependent variable, while the reference rate (BI-Rate) will act as the independent variable. The interpretation of elasticity values (Koutsoyiannis, 1977) is categorized as follows:

- Inelastic ($E < 1$): The dependent variable is less responsive to changes in the independent variable.
- Unitary ($E = 1$): Indicates a proportional relationship where the percentage change in the dependent variable equals the percentage change in the independent variable.
- Elastic ($E > 1$): The dependent variable is highly responsive to changes in the independent variable.

METHODS

This study adopts a quantitative research approach. The data used consists of secondary data from 106 commercial banks, including state-owned banks, Regional Development Banks (BPD), national private banks, and foreign bank branches. The research period spans from the second quarter of 2016 to the fourth quarter of 2023, as this marks the introduction of the BI7DRR as Indonesia's central bank reference rate, expected to enhance the effectiveness of monetary policy transmission through its influence on money market rates and banking interest

rates. Quarterly data is utilized in this study, and data processing is conducted using panel data analysis.

The dependent variable in this study is MSME credit, while the independent variable is the central bank's reference rate (BI-Rate). Additionally, several control variables are included, representing determinants of financial stability that may influence bank lending. These include reserve requirement (GWM), Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), and Non-Performing Loan (NPL) ratio. From a macroeconomic perspective, inflation is also included as a variable, along with bank assets as a control variable, as assets determine a bank's lending capacity and represent its size. To account for factors that may affect or correlate with the BI-Rate and MSME credit during the Covid-19 pandemic, a dummy variable is included, applied for the duration of the pandemic period.

The BI-Rate and inflation data are sourced from Bank Indonesia, while banking data, including MSME credit, assets, GWM, CAR, LDR, and NPL, are obtained from the Financial Statements of Banks published by the Financial Services Authority (OJK).

To analyze the impact of the reference rate (BI-Rate) on MSME credit disbursement, this study employs a panel data regression model using the System Generalized Method of Moments (Sys-GMM) estimation method. GMM is an estimation method capable of addressing autocorrelation and heteroscedasticity issues that may arise in dynamic data. Dynamic data refers to data influenced by previous observations (lagged dependent variable) (Roodman, 2009). Dynamic relationships lead to endogeneity problems, which result in biased and inconsistent estimators when analyzed using static panel data methods. The advantages of using GMM include the following:

- It does not require the assumption of normal distribution.
- It allows for heteroscedasticity of an unknown form.
- It can estimate parameters even if the model cannot be analytically solved using first-order conditions (Verbeek, 2000).

To examine the impact of the BI-Rate implementation on the disbursement of MSME lending during the 2016-2023 period, this study adopts a research hypothesis model based on the findings of previous empirical studies, which indicate that the central bank's reference rate has a significant negative effect on credit disbursement (Anwar et al., 2023). The hypotheses include:

Model 1:

$$\ln UMKM_{it} = \beta_0 + \beta_1 \ln UMKM_{it-1} + \beta_2 BIRate_{it} + \beta_3 \ln Aset_{it} + \beta_4 CAR_{it} + \beta_5 LDR_{it} + \beta_6 NPL_{it} + \beta_7 Inflation_{it} + \beta_8 dCovid_{it} + \varepsilon_{it}$$

$$\ln UMKM_{it} = \alpha_0 + \alpha_1 \ln UMKM_{it-1} + \alpha_2 BIRate_{it} + \alpha_3 GWM_{it} + \alpha_4 \ln Aset_{it} + \alpha_5 CAR_{it} + \alpha_6 LDR_{it} + \alpha_7 NPL_{it} + \alpha_8 Inflation_{it} + \alpha_9 dCovid_{it} + v_{it}$$

Furthermore, to analyze the elasticity of MSME credit with respect to the reference rate (BI-Rate), linear regression/Ordinary Least Squares (OLS) estimation will be used and processed with Excel.

The Sys-GMM model must meet three criteria to determine the best GMM model, which include:

- The Sargan/Hansen Test:

A crucial assumption for the validity of GMM is that the instruments are exogenous, meaning they are not correlated with the error term. The Sargan/Hansen test is used to assess the validity of the instrumental variables that exceed the number of endogenous variables (overidentifying restrictions).

b. The Arellano-Bond Test:

The Arellano-Bond autocorrelation test is used to evaluate the consistency of the estimates obtained from the GMM process by examining the presence or absence of correlation in the error term. The AR(1) and AR(2) estimates indicate the GMM estimation levels, namely the first-order and second-order differences. The AR(2) in System GMM demonstrates that the estimation is conducted not only at the first difference level but also at the level itself. The first equation represents the level formula with first-difference instruments, while the second equation represents the first-difference formula with level instruments, which are then combined into a system of estimations known as Sys-GMM (Blundell & Bond, 2023).

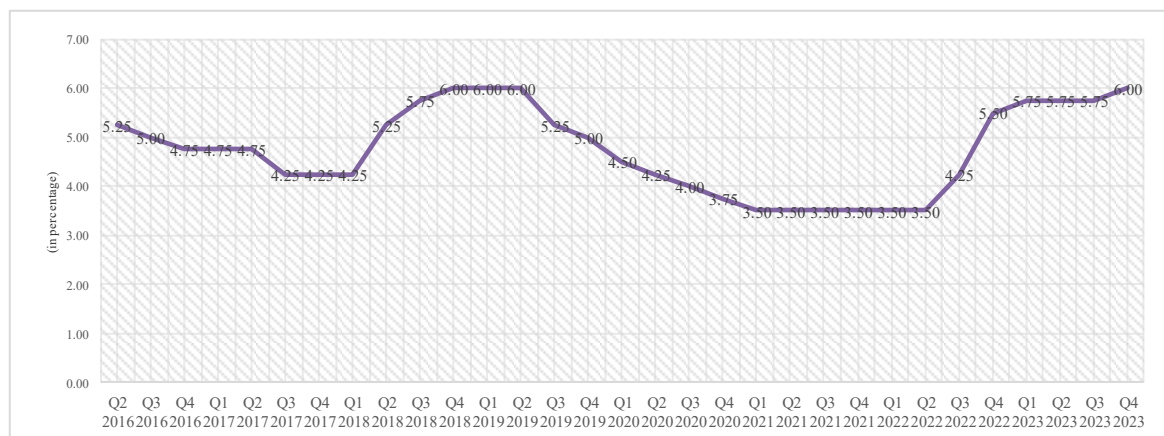
c. Unbiasedness:

The unbiasedness criterion is satisfied when the lag 1 coefficient of the dependent variable (Y) in the FD-GMM or Sys-GMM model falls within the range of the lag 1 coefficient of the dependent variable in the Fixed Effect Model and Common Effect Model.

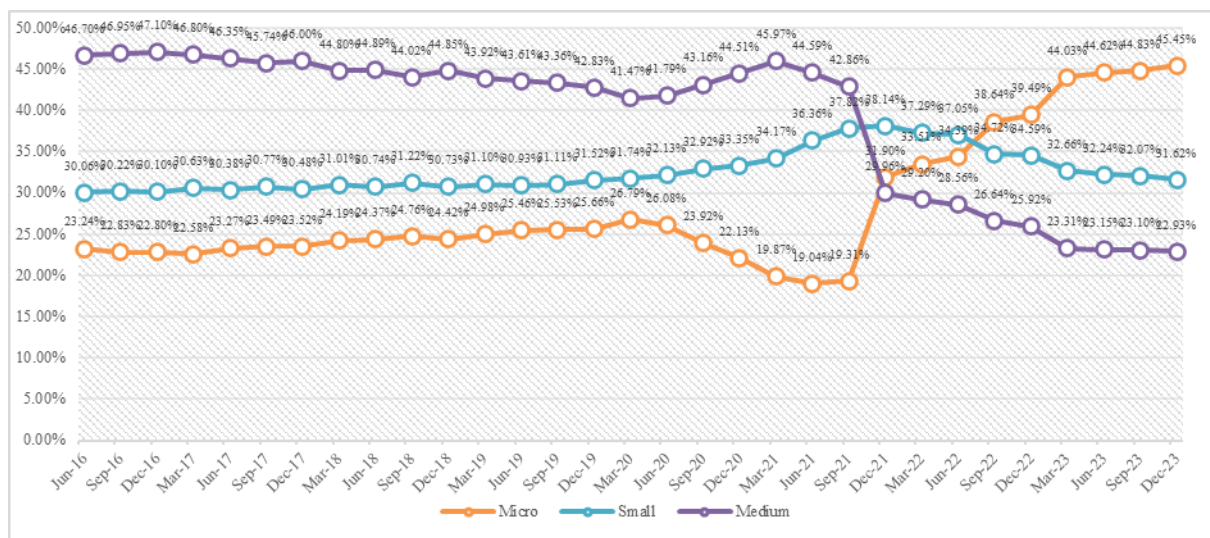
RESULTS

During the research period, which spans from the second quarter of 2016 to the end of 2023, the BI-Rate fluctuated and tended to remain at 3.5% during the pandemic. The interest rate reduction at the onset of the pandemic began at 5% at the end of 2019 and declined to 3.5% by the end of the third quarter of 2022, after which the BI-Rate increased again to 4.25%.

Figure 1 BI-Rate for period 2016-2023

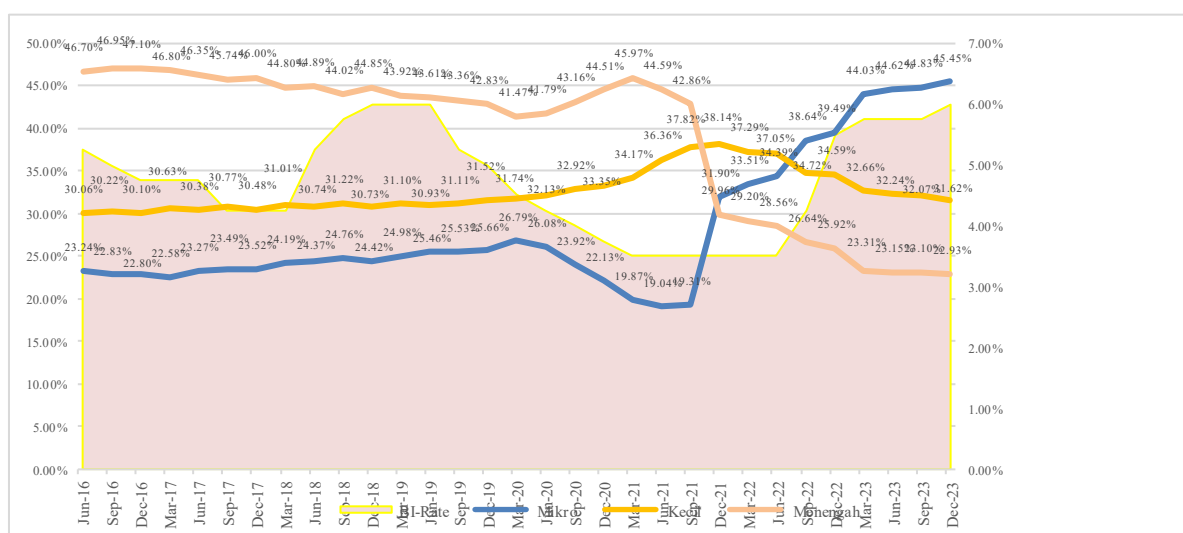


The monetary expansion carried out during the pandemic was implemented as a stimulus to support economic growth during a period of severe downturn. The banking sector's response to changes in the reference rate is not immediate, as banks require time to analyze and communicate changes in lending or deposit rates to their customers. The trend in MSME credit began to rise in early 2022, although a decline was observed in microenterprise loans in 2020 and in medium-sized enterprise loans in mid-2021.

Figure 2 MSMEs Lending for period 2016-2023

According to data from the Indonesian Banking Statistics, MSME credit gradually increased in early 2022 across all scales—micro, small, and medium enterprises. Alongside the growth in credit, the trend in Non-Performing Loans (NPL) also rose.

During the observation period, it was noted that when the interest rate trend increased, the distribution of small and medium-sized loans tended to decline, while a different trend occurred for small loans, which also experienced an increase. Before the pandemic, MSME credit remained relatively stable, with only slight fluctuations in either direction. During the pandemic, microcredit tended to decrease but began to rise again in mid-2021 through 2023 as the BI-Rate increased. For small loans, credit distribution increased during the pandemic when the BI-Rate decreased, but declined when the BI-Rate started to rise. As for medium-sized loans, credit distribution initially increased at the onset of the pandemic but significantly declined by late 2021 despite a lower BI-Rate. However, when the BI-Rate started to rise again, medium-sized credit distribution continued to decline through the end of 2023.

Figure 3 BI-Rate and UMKM Lending for period 2016-2023

Descriptive Statistics

According to the table, there are 3,286 observations, encompassing 106 individual banks studied over 31 quarters. In addition to the dependent variable, MSME credit, and the independent variable, BI-Rate, control variables included in the regression model are GWM, assets, CAR, LDR, NPL, and the Covid-19 pandemic period. From a macroeconomic perspective, the control variable included is inflation.

Table 1 Descriptive Statistics

Variable	Obs.	Mean	Std.Dev.	Min	Max
lnUMKM	3.061	14,419	1,828	4,949	20,324
BIRate	3.286	4,742	0,879	3,5	6
GWM	3.059	9,05032	78,73074	0	4.174,31
lnAset	3.286	16,951	1,472	13,214	21,330
CAR	3.286	33,787	52,158	8,02	1.107,97
LDR	3.286	91,057	47,033	0	971,65
NPL	3.286	1,427	1,331	-0,61	13,54
Inflation	3.286	3,073	1,133	1,33	5,95
dcovid	3.286	0,419	0,494	0	1

Testing Results

To examine the impact of the BI-Rate on MSME credit, regression analysis was conducted using lagged MSME credit (lag 1), BI-Rate, assets, CAR, LDR, NPL, inflation, the Covid-19 dummy variable, and each bank's GWM compliance. The regression was applied in four models to identify the most accurate estimation of the BI-Rate's effect on MSME credit disbursement during the 2016-2023 period (Table 2):

Common Effect Model (CEM) using Ordinary Least Squares (OLS)

Simple OLS was applied in this model; however, the results may still be biased due to endogeneity problems or reverse causality. This occurs when the independent variable (BI-Rate, in this case) is not entirely independent and is influenced by other variables not included in the regression or when information from the independent variable remains embedded in the error term. During the pandemic, characterized by a financial crisis and low credit demand, banks tended to lower credit standards, which led to an increase in NPLs. To address endogeneity issues, a one-period lag was applied to the independent variables. In both models: Lag 1 of MSME credit has a significant positive effect; BI-Rate has a negative effect but is not significantly associated with MSME credit; Assets have a significant positive impact; Inflation does not have a significant influence; LDR shows a negative direction of influence but is only significant in Model 1; NPL has a significant positive impact in each model; CAR does not have a significant effect in any model; The Covid-19 dummy variable has a significant negative effect on MSME credit; GWM does not have a significant effect in Model 2.

Fixed Effect Model (FEM)

The FEM estimation identifies a significant positive impact of lagged MSME credit (lag 1) on MSME credit. A similar positive effect is also observed for the variables assets and NPL. Meanwhile, the BI-Rate has a significant negative impact on MSME credit, consistent with the effects of CAR, LDR, and the Covid-19 dummy variable. Inflation has a significant impact at the 5% significance level in the first model but shows no significant effect in the second model. GWM exhibits a significant negative impact in Model 2.

First Difference-Generalized Method of Moment (FD-GMM)

The estimation results of the First Difference-Generalized Method of Moment (FD-GMM) indicate that the BI-Rate has a significant negative effect on MSME credit. Similar significant negative effects are also observed for the variables CAR, LDR, inflation, and the Covid-19 dummy variable. Significant positive effects on MSME credit are seen for the lagged MSME credit variable (lag 1), assets, and NPL. In Model 2, GMM shows a significant negative impact on MSME credit.

The ideal condition for FD-GMM estimation is the absence of bias, where the coefficient lies between the values obtained from the FEM and CEM. In Model 1: the CEM coefficient is 0.7661, the FEM coefficient is 0.2991, and the FD-GMM estimation result is 0.2956, which is lower than FEM. This indicates a downward bias in the FD-GMM estimation. To address this bias, Sys-GMM estimation will be used.

In Model 2: The FD-GMM, CEM, and FEM coefficients are 0.3032, 0.7755, and 0.2997, respectively. The FD-GMM coefficient lies within the range of the CEM and FEM coefficients, indicating no bias in Model 2 using FD-GMM estimation.

To evaluate the validity of the instrumental variables and determine whether they exceed the number of parameters (overidentifying restrictions), as well as to assess the exogeneity of variables, the Sargan/Hansen Test was conducted for both models. The Sargan test results show that the chi-squared probability value is above the significance level ($p\text{-value} > \alpha$ at 1%, 5%, or 10%), which means the null hypothesis (H_0) is accepted, confirming the validity of the overidentifying restrictions in the model estimation.

To test the consistency of the model and evaluate the consistency of GMM estimates with or without autocorrelation in the error terms, the Arellano-Bond Test was conducted for both models. The test results show $p\text{-values} > \alpha$ (1%, 5%, or 10%) with values of 0.2525 (Model 1) and 0.2967 (Model 2). Thus, the null hypothesis (H_0) is accepted, indicating no autocorrelation in the model, and the model can be considered valid.

System-Generalized Method of Moments (Sys-GMM)

The Sys-GMM estimation results show that, in both models, the BI-Rate has a negative coefficient and a significant impact at the 1% level on MSME credit. This means that every 1% increase in the reference rate is associated with a 4.78% decrease in MSME credit (Model 1) and a 5.13% decrease (Model 2).

The same significant negative effect is observed for the variables CAR and LDR, with a 1% significance level. For CAR, every 1% increase is associated with a 0.48% decrease in MSME credit (Model 1) and a 0.37% decrease (Model 2). The negative coefficient of LDR in both models indicates that every 1% increase in LDR is associated with a 0.17% decrease in MSME credit (Model 1) and a 0.09% decrease (Model 2).

The Covid-19 dummy variable indicates a significant negative effect at the 1% level on MSME credit. This suggests that during the pandemic, MSME credit decreased by 35.31% (Model 1) and 34.92% (Model 2) compared to the non-pandemic period.

Conversely, a significant positive impact at the 1% level on MSME credit is found for the variables lagged MSME credit, assets, and NPL. This implies that a 1% increase in MSME credit in the previous period is associated with a 0.41% increase in the subsequent period (Model 1) and 0.43% (Model 2). Similarly, a 1% increase in assets is associated with a 0.89% increase in MSME credit (Model 1) and 0.78% (Model 2). For NPL, each 1% increase is associated with a 12.37% (Model 1) and 15.12% (Model 2) increase in MSME credit.

Inflation has a significant negative effect on MSME credit at the 1% level in both models. Each 1% increase in inflation is associated with a 2.04% decrease in MSME credit (Model 1) and 1.1% (Model 2). The GMM variable in Model 2 shows a significant negative impact, indicating that each 1% increase in GMM is associated with a 0.20% decrease in MSME credit.

The Sys-GMM estimation yields a coefficient of 0.4099. With the CEM coefficient at 0.7661 and the FEM coefficient at 0.2991, the Sys-GMM estimation (Model 1) lies within the range of the

CEM and FEM coefficients, indicating no bias in the Sys-GMM estimation. The validity of the exogenous variables was tested using the Sargan/Hansen Test. The results show that the chi-squared probability value exceeds the significance level ($p\text{-value} > \alpha$ at 1%, 5%, or 10%), leading to the acceptance of the null hypothesis (H_0), confirming the validity of the overidentifying restrictions in the model estimation.

The Arellano-Bond Test was also conducted to examine the consistency of both models. The results indicate $p\text{-values} > \alpha$ (1%, 5%, or 10%), with values of 0.4311 (Model 1) and 0.5007 (Model 2). Thus, the null hypothesis (H_0) is accepted, indicating no autocorrelation in the models and validating their consistency.

DISCUSSION

The central bank's reference rate, or BI-Rate, is used by banks as a reference for setting lending rates in distributing credit to the public. This study identified that the BI-Rate has a significant negative impact on MSME credit disbursement during the 2016-2023 period, consistent with previous similar studies (Anwar et al., 2023) (Naiborhu, 2020) (Oyebowale, 2020). When the BI-Rate increases as a response to contractionary monetary policy, MSME credit disbursement decreases, and vice versa. This occurs because when the reference rate rises, banks must adjust their lending rates, which discourages borrowers from applying for loans due to higher interest costs.

GWM has a significant negative impact on credit disbursement, aligning with existing theories and literature (Fungá, 2016). This finding is consistent with the theory that an increase in GWM can dampen credit disbursement (Juhro, 2020) because more funds held by banks in the central bank reduce the amount of funds available for lending to the public. Assets were found to have a significant positive effect on MSME credit disbursement (Susanto et al., 2023). This aligns with the theory that the more assets a bank possesses, the more it is encouraged to extend credit to the public.

A significant positive effect was also observed for NPL, which contradicts conventional theory but is supported by some studies with similar findings (Anwar et al., 2023) (Modugu & Dempere, 2022). The positive correlation between NPL and MSME credit disbursement may be due to banks' response during the pandemic, where central bank and government policies encouraged increased credit disbursement to the most affected sector, MSMEs.

LDR and CAR showed significant negative effects on MSME credit during the observation period. The significant negative results for LDR are consistent with previous research (Karamoy & Tulung, 2020). When LDR is high, credit disbursement decreases as banks must maintain liquidity stability and reduce the risk of default. CAR was also found to have a significant negative impact on MSME credit, consistent with studies that suggest an increase in CAR reflects credit risk mitigation by banks, leading to reduced credit disbursement (Qiong, 2017).

Inflation showed a significant negative impact on MSME credit, supported by findings from previous studies (Oyebowale, 2020) (de Leon, 2020) (Khan et al., 2023). When inflation rises, the cost of credit and operational expenses for MSMEs also increase, along with the risk of default. This leads banks to exercise caution in lending, tighten credit requirements, and ultimately decrease credit demand.

The Covid-19 dummy variable was included as a control variable because policies implemented during this period, such as the BI-Rate remaining stable at 3.5% and the introduction of the RPIM policy, also affected MSME credit disbursement. According to this study, the Covid-19 pandemic had a significant negative impact on MSME credit compared to the non-pandemic period, consistent with previous similar studies (Susanto et al., 2023).

Table 2 Estimation Results

Variables	Dependent Variable: UMKM lending							
	FEM		FD-GMM		SYS-GMM		CEM	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
L.InUMKM	0.2991*** (0.0176)	0.2997*** (0.0182)	0.2956*** (0.0013)	0.3032*** (0.0010)	0.4099*** (0.0011)	0.4276*** (0.0014)	0.7661*** (0.0119)	0.7755*** (0.0122)
BIRate	-0.0512*** (0.0184)	-0.0545*** (0.0190)	-0.0615*** (0.0010)	-0.0647*** (0.0010)	-0.0478*** (0.0017)	-0.0513*** (0.0014)	-0.0253 (0.0213)	-0.0281 (0.0220)
GWM		-0.0017* (0.0009)		-0.0024*** (0.0002)		-0.0020*** (0.0002)		-0.0014 (0.0010)
LnAset	0.7328*** (0.0414)	0.6629*** (0.0444)	0.9204*** (0.0050)	0.8066*** (0.0090)	0.8950*** (0.0054)	0.7836*** (0.0061)	0.2334*** (0.0151)	0.2210*** (0.0157)
CAR	-0.0026*** (0.0005)	-0.0021*** (0.0006)	-0.0045*** (0.0001)	-0.0033*** (0.0001)	-0.0048*** (0.0001)	-0.0037*** (0.0001)	-0.0001 (0.0005)	0.0001 (0.0006)
LDR	-0.0016*** (0.0004)	-0.0012*** (0.0004)	-0.0017*** (0.0001)	-0.0012*** (0.0000)	-0.0017*** (0.0000)	-0.0009*** (0.0000)	-0.0012*** (0.0004)	-0.0006 (0.0004)
NPL	0.1169*** (0.0151)	0.1378*** (0.0158)	0.1383*** (0.0027)	0.1638*** (0.0020)	0.1237*** (0.0026)	0.1512*** (0.0029)	0.0378*** (0.0120)	0.0471*** (0.0125)
Inflation	-0.0235** (0.0116)	-0.0154 (0.0118)	-0.0218*** (0.0012)	-0.0125*** (0.0012)	-0.0204*** (0.0009)	-0.0110*** (0.0010)	-0.0138 (0.0138)	-0.0110 (0.0141)
dcovid	-0.3014*** (0.0350)	-0.3034*** (0.0365)	-0.3433*** (0.0032)	-0.3414*** (0.0033)	-0.3531*** (0.0053)	-0.3492*** (0.0053)	-0.1902*** (0.0374)	-0.1968*** (0.0388)
Constant	-1.8310** (0.7123)	-0.7308 (0.7583)	-4.8588*** (0.0754)	-3.1737*** (0.1375)	-6.1266*** (0.0838)	-4.6573*** (0.0927)	-0.2865 (0.2165)	-0.2644 (0.2268)
Observations	2942	2771	2826	2586	2942	2771	2942	2771
Adjusted R ²	0.176	0.165					0.805	0.804

Standard errors in parentheses

* $p < 0.1$, ** $p < .05$, *** $p < .01$

Based on data from the Indonesian Banking Statistics, it is observed that MSME credit disbursement during the observation period by bank group is dominated by state-owned banks (60.22%), followed by national private banks (32.05%), Regional Development Banks (BPD) (7.11%), and foreign bank branches (0.62%). By business scale, the percentage of total MSME credit disbursed by banks during the observation period is distributed as follows: micro-scale (29.58%), small-scale (32.81%), and medium-scale (37.61%). Table 3 presents MSME credit disbursement by bank group over the observation period. State-owned banks dominate credit disbursement for micro and small-scale businesses, while national private banks dominate credit disbursement for medium-scale businesses.

Table 3 MSMEs Lending per Bank Category

Bank Scale	State-owned Banks	BPD	Private Banks	KCLN
Micro	83,34%	5,43%	11,10%	0,13%
Small	71,92%	9,55%	18,38%	0,14%
Medium	31,82%	6,31%	60,45%	1,42%

To examine the elasticity of MSME credit, aggregate data from different bank groups—state-owned banks, regional development banks, private banks, and foreign bank branches—were used for the period 2016 to 2023, employing linear regression estimations. The results, as presented in Table 4, indicate that MSME credit elasticity is generally inelastic, meaning it is less responsive to changes in the BI-Rate. Specifically, a percentage change in the BI-Rate tends to reduce the distribution of small and medium-sized business loans for state-owned banks and microcredit for foreign bank branches. Conversely, the distribution of MSME credit by regional

development banks, small and medium-sized business loans by private banks and foreign bank branches, as well as microcredit by state-owned banks, increases with each rise in the BI-Rate.

Table 4 MSMEs Lending Elasticity

Bank Category	Elasticity		
	Micro	Small	Medium
State-owned Banks	0.7087	-0.2389	-0.6145
BPD	0.4756	0.1755	0.1197
Private Banks	1.8721	0.0803	0.0264
Foreign Banks	-0.7719	0.5022	0.0276
All	0.8233	-0.1396	-0.1716

Elasticity is observed only in microenterprise loans provided by national private banks. National private banks are highly responsive to changes in the BI-Rate, with every 1% increase in the BI-Rate resulting in a 1.8721% increase in microenterprise loans disbursed by these banks. The factors underlying this response include:

a. Risk Diversification:

Banks aim to diversify their credit risks. An increase in the BI-Rate raises lending rates, which can reduce credit demand from large corporations. Consequently, banks shift their focus to MSMEs to reduce concentration risk in specific segments that may pose higher risks.

b. Government Support and Incentives:

The Indonesian government provides various incentives and support programs to encourage credit disbursement to MSMEs, such as interest rate subsidies and credit guarantees, especially during the Covid-19 pandemic. These measures make lending to MSMEs more attractive for banks, even as interest rates rise.

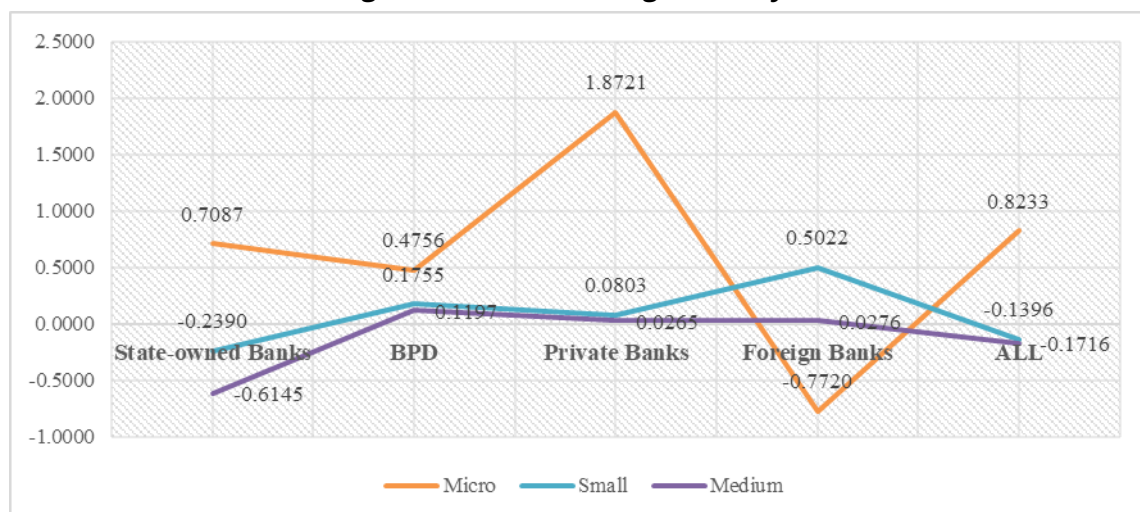
c. Economic Growth and Profit Margins:

MSMEs are key drivers of economic growth and can offer higher profit margins for banks, despite their higher risk profiles. Under higher interest rate conditions, banks may seek opportunities with higher potential returns to offset rising funding costs.

d. Macroprudential Policies:

Bank Indonesia has implemented macroprudential policies encouraging banks to increase lending to MSMEs, even during periods of higher interest rates. For example, the Macroprudential Inclusive Financing Ratio (RPIM) policy, introduced in 2022, supports financial stability and inclusion by promoting MSME credit disbursement.

Figure 4 MSMEs Lending Elasticity



In general, the elasticity of MSME credit for all bank groups indicates an inelastic nature, with interpretations for each scale as follows: Microenterprise Credit: a 1% increase in the BI-Rate is associated with a 0.8233% increase in microenterprise credit; small enterprise credit: a 1% increase in the BI-Rate is associated with a 0.1396% decrease in small enterprise credit; medium enterprise credit: a 1% increase in the BI-Rate is associated with a 0.1716% decrease in medium enterprise credit.

The impact of monetary policy requires a time lag of approximately one year to increase credit supply following expansionary monetary policy (Black & Rosen, 2011). This explains why MSME credit exhibits inelasticity to the BI-Rate, as banks need time to analyze and determine how to respond to market conditions.

CONCLUSION

The central bank's reference rate (BI-Rate) has a significant negative impact on MSME credit in Indonesia during the period from Q2 2016 to Q4 2023. This finding indicates that when the BI-Rate decreases, MSME credit disbursement increases, and conversely, when the BI-Rate rises, MSME credit disbursement decreases. This result, consistent with monetary policy theory, demonstrates that the BI-Rate can effectively serve as a monetary instrument to maintain financial and monetary stability.

The distribution of MSME credit and its elasticity to the BI-Rate indicate that state-owned banks dominate credit provision for micro and small-scale enterprises but show a significant decline in their contribution to medium-scale credit, suggesting a primary focus on smaller segments. In contrast, private banks lead in medium-scale credit distribution, with a very high elasticity of microcredit to the BI-Rate, indicating a significant impact of monetary policy on this segment. Meanwhile, regional development banks (BPD) have a small contribution across all scales, particularly for medium-scale credit, and foreign bank branches (KCLN) play a very minimal role in domestic MSME credit provision. Overall, microcredit elasticity is higher than that of small and medium-sized loans.

The elasticity of MSME credit to the central bank's reference rate (BI-Rate) generally shows inelastic results, meaning that MSME credit is less responsive to changes in the BI-Rate. Highly elastic or very responsive results are only observed in the distribution of microcredit by private banks. This is understandable, as there is a time lag in the transmission of monetary policy. Banks do not immediately respond to changes in the reference rate; instead, they require a thorough analysis and careful market considerations before adjusting their lending behavior.

The findings of this study are expected to contribute to filling the gap in the literature on banking credit disbursement during the Covid-19 pandemic and the implementation of other central bank policies. This research offers a more comprehensive analysis, covering 106 commercial banks in Indonesia, including state-owned banks, regional development banks, private banks, and foreign bank branches. The observation period is also more recent, spanning from 2016 to 2023, and considers the impact of the Covid-19 pandemic.

This study identifies that the central bank's reference rate (BI-Rate) has a significant negative impact on MSME credit distribution during the period 2016 to 2023. MSME credit across different bank groups shows varying patterns and sensitivities or response levels to the BI-Rate. Based on these findings, several recommendations are proposed:

1. Changes in the BI-Rate are found to have a greater impact on microcredit. Therefore, the government and the central bank should formulate policies that support reference rate adjustments that continue to favor the micro segment while also encouraging the small and medium segments to become more responsive. This can be achieved by providing incentives to bank groups with consistently increasing credit distribution across all MSME segments.
2. The government and the central bank should strengthen the role of regional development banks (BPD) and foreign bank branches (KCLN) in promoting a more equitable distribution of

MSME credit. This effort can begin with focus group discussions involving BPD and KCLN to gain deeper insights into the challenges, obstacles, and difficulties in MSME credit distribution within these banks, followed by the implementation of appropriate policy measures.

LIMITATION

Given the limitations of this study, the following suggestions are proposed as guidelines for future research:

1. Conduct studies on financial institutions other than commercial banks, using a more recent observation period, to obtain a more comprehensive view of MSME credit distribution by both banking and non-banking financial institutions.
2. Use MSME credit as an independent variable, disaggregated by business scale (micro, small, and medium), to better understand the behavior of each business category.
3. Conduct qualitative research to analyze the implementation of policies related to MSME credit, gathering information from various stakeholders, including regulators, financial institutions, and MSME entrepreneurs.
4. Incorporate interaction variables between the reserve requirement ratio (GWM) and BI-Rate, considering that these macroprudential and monetary variables are interconnected and influence MSME credit distribution.

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