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Determinants of credit disbursement in small Indonesian commercial banks: An ARDL cointegration analysis

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ABSTRACT

This study investigates the determinants of credit disbursement in small commercial banks in Indonesia, highlighting their essential role in the country's economic growth. It focuses on KBMI 1 banks — commercial banks with core capital below IDR 6 trillion — a segment that has received limited attention in the empirical literature despite exhibiting credit stagnation while larger banks expand. While large banks show an upward trend in credit disbursement, small banks face stagnation or decline, creating a paradox relative to the theoretical expectations. This study's novelty lies in jointly examining microeconomic (credit interest rate), macroeconomic (inflation and exchange rate), and IKNB-based (shadow banking) determinants within a single ARDL cointegration framework applied specifically to KBMI 1 banks, a combination that prior studies have not addressed in this institutional context. This study employs the Autoregressive Distributed Lag (ARDL) approach, which captures both short- and long-term effects while accommodating mixed-order stationarity. The findings reveal that credit interest rates, exchange rates, and shadow banking significantly affect long-term credit disbursement, whereas inflation has no significant effect in the short or long run. Shadow banking exerts the strongest and most consistent influence across both the time horizons. Based on these insights, this study recommends that small banks diversify their services and strengthen strategic collaborations with non-bank financial institutions to enhance credit accessibility and financial stability.

Keywords: credit disbursement, small commercial banks, shadow banking, ARDL model

1. INTRODUCTION

Banking is essential for bolstering the economy by serving as a financial intermediary and channeling funds from surplus units to deficit units through credit provision (Rifawati, 2021). As a primary financing activity, credit is critical in advancing economic growth for individuals, businesses, and other entities needing funds for various purposes, such as asset acquisition, working capital, and investments (Hamid, 2019). Effective credit disbursement can enhance a bank's position by expanding its financial service reach and optimizing its revenues. However, for a significant impact on banking and overall economic growth, sustainable and healthy credit disbursement practices must be analyzed (Gabeshi, 2021).

The performance of national commercial bank credit disbursement continues to show significant growth. In 2001, credit disbursement amounted to IDR 316 trillion and increased to IDR 6,497 trillion in 2022, reaching approximately 33.16 percent of Indonesia's Gross Domestic Product in 2022 (Otoritas Jasa Keuangan [OJK], 2023). According to the Asian Development Bank report (2022), factors contributing to the increase in credit disbursement in Indonesia include economic recovery, controlled inflation, increased investment, government policy support, and the enhancement of digital infrastructure. Bank Indonesia (Central Bank of Indonesia, BI) survey results on banking financing demand and supply in 2022 indicate that household and corporate demand drove increased credit disbursement. Thus, credit disbursement is crucial for providing financial support to households, corporations, and the economy (See Figure 1).

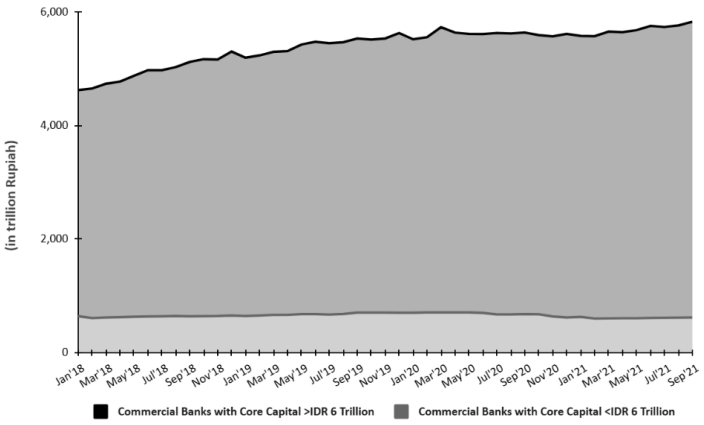

Figure 1. Volume of Credit Disbursement Realization in Indonesia, 2018-2021

Source: Indonesian Banking Statistics (SPI), Otoritas Jasa Keuangan, 2021

This study focuses on the credit disbursement of commercial banks with a small core capital. According to Otoritas Jasa Keuangan Regulation (POJK) Number 12/POJK.03/2021, commercial banks are categorized into four groups based on Tier 1 Capital (KBMI). This study refers to commercial banks with Tier 1 capital of less than IDR 6 trillion (Otoritas Jasa Keuangan, 2021). Commercial banks in this category show a different trend. The credit disbursement trend tended to stagnate, with a decline of 3.70 percent, in contrast to commercial banks with core capital above IDR 6 trillion, which experienced an increase of 23.57 percent.

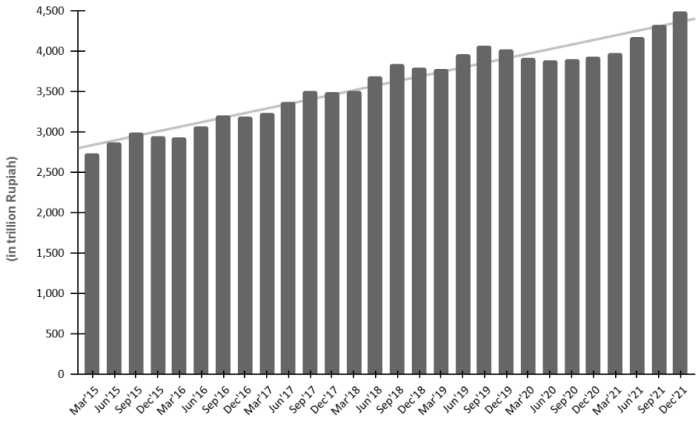

Figure 2. Quarterly Volume of Gross Domestic Product (GDP) Realization in Indonesia, 2015-2021

Source: Badan Pusat Statistik, 2021

As shown in Figure 2, based on the banking credit creation theory, overall economic conditions influence credit distribution (Starkey, 2018). Oktaviana (2022) found that high or low economic growth determines national credit disbursement risk, thereby impacting bank credit disbursement rates. Although economic conditions improve through GDP growth, credit disbursement by KBMI 1 banks follows a different trend, creating a mismatch between ideal and actual conditions.

The credit scheme of commercial banks in Indonesia with a core capital of less than Rp 6 trillion reflects a conservative policy and high dependence on credit distribution, as more than 80 percent of third-party funds are re-channeled into loans (Bank Indonesia, 2022). Small banks typically focus only on credit distribution to MSMEs. This condition restricts their business expansion compared to larger banks with more outstanding core capital, which can provide loans across a broader range of businesses and maximize revenues (Klein & Turk-Ariss, 2022). Omar & Al-Tawati (2019); Dasih (2021) found that assets, capital, and inflation affect bank credit performance. As the economy grows, credit demand increases, driven by benchmark interest rates and low inflation, creating price stability (Purba & Sakti, 2022). As a determinant of bank credit distribution, the benchmark interest rate plays a significant role in determining lending rates. A decrease in the benchmark interest rate by 1.5 percent during 2020-2021 reduced lending rates by 0.84 percent, thereby increasing credit distribution and economic growth (Bank Indonesia, 2021; Eltania, 2022), in line with Keynes' view that lowers interest rates stimulate demand for money and credit. Hourani & Mondello (2021), (De Jonghe et al., 2019), and Tjaru (2021) also explain that macroeconomic factors affect bank core capital, influencing credit and economic growth.

Inflation significantly affects credit disbursement; in the short term, it increases, but in the long term, it decreases credit disbursement (Büyükbaşaran et al., 2022; Tinoco-Zermeño et al., 2022; Setiawan & Widiastuti, 2021). However, in some other previous studies, the findings of Gabeshi (2021) found different results: the inflation rate negatively affects credit distribution. These findings contradict the research of Büyükbaşaran, Tinoco-Zermeno, and Setiawan et al. (2021). Additionally, Bashir & Ibrahim (2020) found that exchange rates strongly influence credit disbursement, with a significant positive impact in the long run. In the short run, the exchange rate also positively affects bank credit. In addition, shadow banking, which provides financing to the private sector that commercial banks underserve, plays a vital role in bank lending (Liang, 2016). The growth of multifinance assets in Indonesia shows high confidence in these entities, increasing 17.67 percent from IDR555.69 billion to IDR653.83 billion between January 2018 and March 2020 and peaking at IDR683.34 billion in September 2022. Research suggests that shadow banking significantly impacts short-term competition and long-term parallel credit systems outside of commercial banking regulations and contributes to the global financial crisis by reducing bank credit (Liang, 2016; International Monetary Fund, 2017).

The study period and variables are a synthesis between current and previous research. While studies by Liang (2016), Ari et al. (2017), Sun (2019), and Nath & Chowdhury (2021) have examined the relationship between shadow banking and bank credit, they predominantly analyze national or large banking systems and do not isolate the KBMI 1 segment. Furthermore, no single prior study simultaneously integrates microeconomic (credit interest rate), macroeconomic (inflation and exchange rate), and IKNB-based (shadow banking) determinants within an ARDL cointegration framework applied specifically to Indonesian commercial banks with core capital below IDR 6 trillion. This combination constitutes the genuine research gap this study addresses. This study sets out to explore both the short-term and long-term impacts of credit interest rates, inflation, exchange rates, and shadow banking on credit disbursement in commercial banks with core capital under IDR 6 trillion in Indonesia. The motivation stems from a noticeable disconnect between theoretical expectations and what is observed in the field, especially in economic and banking reports from 2018 to 2022. By looking into these specific factors, the research aims to provide valuable insights into the determinants of credit disbursement from a microeconomic, macroeconomic, and non-bank financial institution (IKNB) perspective, filling a gap that previous studies have not addressed in the Indonesian KBMI 1 context.

To tackle the limitations of earlier research and to provide a more comprehensive analysis, this study employs the Autoregressive Distributed Lag (ARDL) approach. ARDL is particularly suited for this type of analysis because it allows for the examination of both short-term and long-term relationships between variables. This flexibility makes it especially valuable when analyzing smaller commercial banks, as it can accommodate limited data while still producing reliable results. While previous studies—such as those by Gabeshi (2021), Bashir & Ibrahim (2020), and Liang (2016)—have predominantly focused on credit disbursement in national banks, this research takes a different path by specifically targeting commercial banks with smaller core capital, filling an important gap in the literature. In doing so, the study hopes to contribute to a better understanding of the challenges and opportunities facing smaller commercial banks in Indonesia, especially in terms of credit allocation.

2. LITERATURE REVIEW

2.1. Banking Credit Creation Theory

Banks have a unique ability to create credit, significantly impacting the economy. This process involves providing capital to sectors needing it, thereby triggering changes in credit allocation and promoting production growth (Starkey, 2018). External factors such as market size and economic growth potential also influence the effectiveness of credit allocation by banks. Central banks are essential in regulating loan demand through benchmark interest rate adjustments. Lowering benchmark interest rates can increase loans and credit allocation (Barra & Ruggiero, 2021). The credit creation theory also links credit expansion with inflation, indicating the potential impact of credit creation on price levels. Therefore, policymakers must make credit allocation decisions carefully to avoid uncontrolled inflation. Broader economic conditions, bank balance sheet management, and regulatory frameworks influence credit allocation. Research by Barra & Ruggiero (2021) and Gabeshi (2021) shows that economic stability enhances credit demand and public trust in banking institutions.

2.2. Market Discipline Theory

Market Discipline Theory asserts that market forces, such as investor and depositor behavior, can discipline financial institutions by monitoring bank risks (World Bank, 2019). However, the emergence of shadow banking weakens market discipline for commercial banks because these entities are more willing to take high risks in liquidity allocation and financing, even during crises (Sieron, 2018; International Monetary Fund, 2017). Shadow banking significantly influences commercial banks' disbursement and allocation of credit. This influence is evident as depositors withdraw funds early, compelling banks to assume higher portfolio risks and relax credit standards to maintain liquidity stability (International Monetary Fund, 2017).

2.3. Monetary Policy Transmission: Credit View

Monetary Policy Transmission describes the interaction between central banks, the financial sector, and the real economy. Central bank benchmark interest rate policies affect money market interest rates, subsequently influencing banking credit interest rates (Bank Indonesia, 2004). Stable exchange rates affect bank credit risks and credit allocation decisions. Inflation is also crucial, as increased inflation can reduce purchasing power and credit demand. The risk role pathway indicates that monetary policy can affect bank credit supply through decisions made when facing risks (Wulandari & Ismail, 2015).

2.4. Small Core Capital Banks

Tier 1 core capital consists of primary and additional core capital as a buffer against bank failures. Banks with small core capital are more vulnerable to economic instability and face liquidity constraints in lending (Hourani & Mondello, 2021). Bank size and capitalization play a role in determining bank performance and economic impact (Pratama, 2019; Purba & Sakti, 2022; Cappelletti et al., 2015). Banks with small core capital are more susceptible to changes in external and internal conditions than banks with significant core capital (Ai et al., 2020).

2.5. Hypothesis Development

2.5.1. Relationship between Credit Interest Rates and Credit Disbursement

The theory of credit creation and monetary policy transmission indicates that credit interest rates influence credit disbursement activities. High interest rates increase borrowing costs and decrease credit demand, whereas low interest rates stimulate credit demand (Eltania, 2022). Increased credit demand leads to higher credit disbursement. The concept of bank core capital suggests that credit interest rates negatively impact credit disbursement by public banks with core capital of less than IDR 6 trillion in Indonesia. Therefore, the hypothesis proposed is:

H1: Credit interest rates negatively affect credit disbursement by commercial banks with core capital of less than IDR 6 trillion in Indonesia.

2.5.2. Relationship between Inflation and Credit Disbursement

The theory of banking credit creation suggests that inflation can hinder credit disbursement by reducing consumers' purchasing power, increasing banks' operating costs, and elevating credit risks (Gabeshi, 2021). Several studies, such as those by Bashir & Ibrahim (2020) have shown that inflation tends to negatively impact credit supply, especially for banks with smaller core capital, which are more vulnerable to external shifts (Pratama, 2019; Purba & Sakti, 2022; Cappelletti et al., 2015). Building on these insights, the hypothesis proposed is:

H2: Inflation negatively affects credit disbursement by commercial banks with core capital of less than IDR 6 trillion in Indonesia.

2.5.3. Relationship between Exchange Rates and Credit Disbursement

Exchange rate fluctuations can affect banks' liquidity and increase the risk involved in credit decisions. When exchange rates are volatile, banks often become more cautious in extending credit (Büyükbasaran et al., 2022). However, research by Bashir & Ibrahim (2020) and Purba & Sakti (2022) suggests that a stronger rupiah can positively influence credit disbursement, as a stable currency boosts confidence. Drawing from these findings, the hypothesis is:

H3: Exchange rates positively affects credit disbursement by commercial banks with core capital of less than IDR 6 trillion in Indonesia.

2.5.4. Relationship between Shadow Banking and Credit Disbursement

Studies by Ari et al. (2017) and Liang (2016) indicate that shadow banking can shape how traditional banks allocate credit, often pushing them to take on riskier ventures in order to stay competitive, which, in turn, increases credit disbursement. Further research by Sun (2019) and Nath & Chowdhury

(2021) supports the notion that shadow banking positively impacts banks' credit activities. In light of the idea that smaller banks are more susceptible to external factors, the following hypothesis is proposed:

H4: Shadow Banking positively affects credit disbursement by commercial banks with core capital of less than IDR 6 trillion in Indonesia.

3. METHOD

This study adopts a quantitative approach, using secondary data from January 2018 to December 2022. The dataset includes actual credit disbursement figures, along with microeconomic, macroeconomic, and non-bank financial institution (Industri Keuangan Non-Bank, IKNB) data. From a total of 105 commercial banks, 38 were selected based on purposive sampling criteria. These banks had core capital of less than IDR 6 trillion as of December 2022 and provided complete monthly financial reports throughout the study period. This selection ensures data relevance and supports the research focus. The 38 selected banks were aggregated into a single monthly time series by summing total credit disbursement across all sampled banks for each observation period, yielding N = 60 monthly observations (January 2018 to December 2022). This aggregation approach was adopted because the research objective is to understand the macroeconomic and institutional determinants of credit expansion at the KBMI 1 segment level as a whole, rather than to explain cross-bank variation. It is acknowledged, however, that this aggregation discards cross-bank heterogeneity — such as differences in business model, regional concentration, or asset quality — which may be relevant for understanding individual bank behavior. Future research employing panel data could address this limitation.

The data on commercial banks' credit distribution was obtained from the financial statements published on the respective banks' websites. Credit interest rate variables were sourced from the Badan Pusat Statistik (Statistics Indonesia, BPS). This variable is classified as a microeconomic variable in this study because it reflects bank-level pricing behavior — the rate that individual commercial banks charge borrowers — which is shaped by competitive dynamics and bank-specific cost structures, as distinct from the BI 7-Day Reverse Repo Rate (BI Rate), which is a central bank policy instrument. Macroeconomic variables, including inflation and exchange rates, were obtained from Bank Indonesia, as both indicators represent economy-wide price conditions that are exogenous to any single bank's decision-making. Data on IKNB financing disbursement, representing shadow banking, were sourced from the Otoritas Jasa Keuangan (Financial Services Authority of Indonesia, OJK).

Data processing utilized EVIEWS 10 with the ARDL (Autoregressive Distributed Lag) model. The ARDL model was selected for its ability to estimate both long-term and short-term relationships between dependent and independent variables that are not only contemporaneously related but also at lagged values (Bashir & Ibrahim, 2020). This model provides reliable results even with small samples and accommodates independent variables stationary at different levels (Pesaran, 2008). The general equation of the ARDL model (p, q) is as follows:

$$\boldsymbol{y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \emptyset_i y_{t-i} + \beta' x_t + \sum_{1=0}^{q-1} \beta_i^{*\prime} \Delta x_{t-i} + \mu_t} \qquad \textbf{(1)}$$

$$\boldsymbol{\Delta x_t = P_0 \Delta x_{t-1} + P_2 \Delta x_{t-2} + \cdots + P_s \Delta x_{t-s} + \varepsilon_t} \qquad \textbf{(2)}$$

In the ARDL model, analysts need to analyze several tests. Conducted stationarity tests using the Augmented Dickey-Fuller (ADF) method to ensure the data did not contain unit roots. The ARDL model does not recommend that the data be second-differenced stationary. They performed cointegration testing with the bounds test, which was considered more flexible and consistent for data with different level stationarities (Chinenye & Acha, 2018). If the null hypothesis of no cointegration is rejected, analysts estimate the model using an error-correction term:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta x1_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta x2_{t-i} + \sum_{i=1}^{n} \beta_3 \Delta x3_{t-i} + \sum_{i=1}^{n} \beta_4 \Delta x4_{t-i} + \beta_5 EC_{t-1} + \varepsilon_t \quad (3)$$

Before ARDL estimation, classic assumption tests, including normality, heteroskedasticity, autocorrelation, and multicollinearity, were conducted to ensure accurate, unbiased, and consistent regression estimation. Model stability testing was also conducted to evaluate the spread of data around the error values. These various tests allowed the model to be comprehensively evaluated to ensure the interpretation of analysis results is justified.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Table 1 shows the data distribution for each dependent and independent variable. The credit disbursement variable is measured based on the total credit disbursed by commercial banks with core capital of less than IDR 6 trillion from 38 sampled banks, aggregated into a monthly time series (N = 60 monthly observations). The data distribution for this variable shows a minimum value of IDR 264,747.8 billion, a maximum value of IDR 395,895.5 billion, a mean of IDR 319,283.6 billion, and a standard deviation of IDR 30,616.24 billion. The coefficient of variation (CV = 30,616.24 / 319,283.6 ≈ 9.6 percent) indicates relatively modest dispersion around the mean. The mean lies approximately 1.78 standard deviations above the minimum and 2.50 standard deviations below the maximum, suggesting mild right-skewness in the distribution.

Table 1. Descriptive Statistics Test Results

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Credit Disbursement	60	264748	395895	319283.6	30616.21
Credit Interest Rates	60	4.25	6.75	5.304167	1.00009
Inflation	60	1.32	5.95	2.805667	1.15933
Exchange Rates	60	13413	16367	14456.97	530.6832
Shadow Banking	60	358783	453246	406903	33586.88

Source: Data Processed (2024)

Table 1 shows the data distribution for the independent variables. The credit interest rate variable is measured by the monthly banking interest rate in Indonesia. The distribution shows a minimum of 4.25 percent, a maximum of 6.75 percent, a mean of 5.30 percent, and a standard deviation of 1.00 percent. The CV of approximately 18.9 percent indicates relatively low variability. The proximity of the mean to the midpoint of the range (range midpoint = 5.50 percent) suggests a roughly symmetric distribution, while the relatively narrow range (2.50 percentage points) reflects periods of policy rate stability. Inflation, measured by the monthly inflation rate, shows a minimum of 1.32 percent, a maximum of 5.95 percent, a mean of 2.81 percent, and a standard deviation of 1.16 percent. The CV of approximately 41.3 percent indicates moderate variability relative to the mean. The mean lies closer to the minimum than to the maximum (distance to minimum: 1.49 pp; distance to maximum: 3.14 pp), indicating right-skewness — meaning that while most observations cluster at relatively low inflation, some months recorded considerably higher rates. These distributional features reflect the mixed inflation dynamics in Indonesia over 2018–2022, including periods of pandemic-induced deflation and subsequent price pressures.

The data distribution for the exchange rate variable shows a minimum value of IDR 13,413, a maximum value of IDR 16,367, a mean of IDR 14,457, and a standard deviation of IDR 530.68. This variable is measured as the IDR/USD mid-rate. The CV of approximately 3.7 percent indicates low dispersion relative to the mean, reflecting that the rupiah, while subject to fluctuations, remained within a bounded range during the study period. The mean lies closer to the minimum than to the maximum (distance to minimum: IDR 1,044; distance to maximum: IDR 1,910), indicating mild right-skewness —

consistent with periods of pronounced rupiah depreciation, notably during 2020, while most observations clustered at lower (stronger) exchange rate levels.

Shadow banking is a variable measured by the total financing disbursed by non-bank financial institutions. The data distribution for this variable shows a minimum value of IDR 358,783 billion, a maximum value of IDR 453,146 billion, an average of IDR 406,903 billion, and a standard deviation of 33,583.88. These results indicate that shadow banking has a relatively high contribution with a high data variance.

4.2. Stationarity Test

This stage was conducted using a unit root test on each variable and simultaneously to determine the stationarity level of the variables, aiming to avoid spurious regression results in the data using the Augmented Dickey-Fuller (ADF) test. This test assumes the variable will be stationary in order I(0) or I(1). If the probability value is greater than the significance level at α=5 percent, the null hypothesis of the unit root cannot be rejected, indicating that the variable is not stationary. The lag length in the unit root test is determined based on the Schwarz Information Criterion (SBC).

Table 2 shows that at the level stage, the credit disbursement, credit interest rate, inflation, and shadow banking variables have probabilities above 0.05, indicating that these variables are not stationary, with only the exchange rate variable being stationary. Subsequently, the unit root test was conducted at the first difference level, providing stationary results for the credit disbursement, credit interest rate, inflation, exchange rate, and shadow banking variables. The simultaneous unit root test also produced stationarity at the first difference. Therefore, it can be concluded that the model has a mix of stationary conditions, with all variables partially and simultaneously integrated at the order I(1), indicating that the ARDL model is appropriate.

Table 2. ADF Unit Root Test Results

Variable	Level		First Difference		Integrated order
	Prob.	conclusion	Prob.	Conclusion	
Credit Disbursement	1.0000	Not Stationary	0.0000	Stationer	I(1)
Credit Interest Rates	0.7482	Not Stationary	0.0000	Stationer	I(1)
Inflation	0.0647	Not Stationary	0.0358	Stationer	I(1)
Exchange Rates	0.0288	Stationer	0.0000	Stationer	I(0), I(1)
Shadow Banking	0.6511	Not Stationary	0.0111	Stationer	I(1)
	Simultan Method				
	ADF – Fisher Chi-square ADF – Choi Z-stat		0.0000 0.0000	Stationer Stationer	I(1) I(1)

Source: Data Processed (2024)

4.3. ARDL Model Estimation

The ARDL model estimation was conducted using the Akaike Information Criterion (AIC). The study used a maximum lag of 4 and obtained the ARDL (1, 4, 0, 4, 0) model. The ARDL (1, 4, 0, 4, 0) model indicates the maximum lag for each variable, implying that the optimal lag chosen is a combination of lags that produce the best model. This model explains that the credit disbursement variable has a total lag of one, the credit interest rate has four lags, inflation has no lag, the exchange rate has four lags, and shadow banking has no lag in the short-term.

As shown in Table 3, the model explains approximately 52.80 percent of the variation in the dependent variable, as indicated by the R-squared value of 0.5280. The remaining 47.20 percent is influenced by other variables not included in the model. The considerable unexplained variation in the model indicates the presence of unmeasured external factors that cause unexplained variation. The F-statistic probability value is significant at 0.000994, indicating that all variables simultaneously significantly affect the credit disbursement of commercial banks with core capital of less than IDR 6 trillion in Indonesia.

Table 3. ARDL Estimation Results

ARDL (1, 4, 0, 4, 0)				
Variable	**Coefficient**	**Std. err.**	**t**	**Prob.**
Credit Disbursement				
L1.	0.117112	0.130023	0.900702	0.3730
Credit Interest Rates				
--.	-0.084074	0.053731	-1.564721	0.1253
L1.	-0.037408	0.051519	-0.726090	0.4719
L2.	-0.041102	0.052268	-0.786369	0.4362
L3.	-0.056899	0.058097	-0.979377	0.3331
L4.	-0.155223	0.063178	-2.456918	0.0183
Inflation				
---.	-0.012583	0.046537	-0.270384	0.7882
Exchange Rate				
--.	0.001688	0.020477	0.082418	0.9347
L1.	0.028406	0.019454	1.460134	0.1519
L2.	0.053906	0.020699	2.604285	0.0128
L3.	0.008411	0.019140	0.439439	0.6627
L4.	0.034907	0.017688	1.973477	0.0552
Shadow Banking				
--.	0.685865	0.134719	5.091070	0.0000
_cons	0.061825	0.015242	4.056275	0.0002
R-squared	0.528020	Mean dependent var		0.071198
Adjusted R-squared	0.378367	S.D. dependent var		0.117570
S.E. of regression	0.092696	Akaike info criterion		-1.703644
Sum squared resid	0.352298	Schwarz criterion		-1.192686
Log likelihood	60.85020	Hannan-Quinn criter.		-1.506052
F-statistic	3.528310	Durbin-Watson stat		2.141390
Prob(F-statistic)	0.000994			

Source: Data Processed (2024)

In this estimation, the dependent variable can influence its past values and the lagged values of independent variables. The choice of lag determines the extent to which the impact of a variable persists over time. Variables with more optimal lags have a longer-term impact than variables with fewer (Pesaran, 2008). Credit disbursement in the previous period does not affect current credit disbursement, with a coefficient of 0.117112 and a significance level of 0.3730. Meanwhile, the credit interest rate depicts a relatively stable condition, with three out of four lags showing no significant impact on credit disbursement from lag 1 to lag 3, with all coefficients being negative. The numerous lags imply that the credit interest rate has a long-term relationship with the credit disbursement of small banks, although it is insignificant.

Inflation also shows no statistically significant effect, as indicated by a probability of 0.7882, suggesting that inflation does not impact credit disbursement in the short term. Moreover, an optimal lag of 0 indicates that inflation likely has no long-term influence. The exchange rate shows a consistent coefficient direction towards credit disbursement, but only lag 2 of the four lags has a significant impact at α=5 percent. The number of lags, lag significance, and consistency of the coefficient direction imply that the exchange rate has a long-term stable influence. Shadow banking has a coefficient of 0.6858 and a probability of 0.0000, indicating that shadow banking in the current period has a significant positive effect on current lending. This suggests that shadow banking is closely related to the short-term lending of small banks.

Based on the findings, there are implications for the differing relationships between microeconomic variables, macroeconomic variables, and non-bank financial institutions on the credit disbursement of commercial banks with a small core capital. Small-cap banks are responsive to changes in shadow banking financing disbursement in the short term. However, they may be more responsive to microeconomic and macroeconomic variables. Credit interest rates, inflation, and exchange rates do not significantly impact nearly all lags, implying that bank interest rate decisions and monetary policy in Indonesia have yet to actively support the growth of small commercial bank credit.

4.4. Cointegration Analysis

A cointegration test was performed to determine whether the model had a long-term relationship. The model is cointegrated if the F-value is greater than the critical value at the 5 percent level for the I(1) order. This condition implies a long-term relationship in the model, allowing the null hypothesis to be rejected in the long run. Conversely, if the F-value is smaller, the null hypothesis cannot be rejected, indicating that there is no long-term relationship in the model.

Table 4. Cointegration Test Results

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	12.36296		Finite Sample: n=55	
k	4	10%	2.345	3.28
		5%	2.763	3.813
		1%	3.738	4.947

Source: Data Processed (2024)

Based on the cointegration test using the Bound Test in Table 4, the F-value is 12.36296, which is greater at the 10 percent, 5 percent, and 1 percent significance levels for the I(1) order. The null hypothesis stating no level relationship between variables in the model can be rejected, indicating that the independent and dependent variables have a stable long-term relationship, which means that changes in one variable are systematically related to changes in another variable in the long term. Cointegration in the model implies that an error correction term model should be estimated to observe the model's equilibrium adjustment.

4.5. ARDL Dynamic Model Equation

This model equation explains the extent to which the independent variables impact the dependent variable in the short and long terms. It also shows how quickly the short-term model adjusts to the long-term model.

Table 5. Long-Term Estimation Results

ARDL Long-run Form			**Conclusion**
Variable	**Coefficient**	**Prob.**	
Credit Interest Rate	-0.424409	0.0149	Significant in the long run
Inflation	-0.014252	0.7909	Not significant in the long run
Exchange Rate	0.114205	0.0240	Significant in the long run
Shadow Banking	0.776842	0.0002	Significant in the long run
_cons	0.070026	0.0000	Significant

Source: Data Processed (2024)

Table 5 shows that credit interest rates, exchange rates, and shadow banking significantly impact credit disbursement. Meanwhile, inflation does not significantly impact credit disbursement. In the short term, as shown in Table 6, only shadow banking significantly affects credit disbursement. A coefficient of 0.776842 indicates that a 1 percent relative change in shadow banking results in a 0.77 percent increase in credit disbursement. Meanwhile, credit interest rates, inflation, and exchange rates show opposite results. These three indicators did not have a significant impact in the short term.

Table 6. Short-Term Estimation Results

ARDL Error Correction Regression			Conclusion
Variable	**Coefficient**	**Prob.**	
Credit Interest Rates	-0.084074	0.1253	Not significant in the short run
Inflation	-0.012583	0.7882	Not significant in the short run
Exchange Rate	0.001688	0.9347	Not significant in the short run
Shadow Banking	0.685865	0.0000	Significant in the short run
CointEq(-1)*	-0.882888	0.0000	Significant

Source: Data Processed (2024)

Furthermore, Table 6 shows that CointEq as an Error-Correction Term (ECT) indicator has a coefficient of -0.882888, representing 88.28 percent. This implies that a short-term deviation from the long-term equilibrium at time t-1 will be corrected by 88.28 percent per month. The ECT coefficient has a negative sign and a probability below 0.05, indicating that the test model can be considered valid and consistent with the findings of Bashir & Ibrahim (2020). These results indicate the high validity of the long-term equilibrium relationship among the research variables in Indonesia.

This analysis suggests that policies regarding credit interest rates, exchange rates, and shadow banking consistently influence credit disbursement in small banks. Notably, shadow banking plays a crucial role in both short- and long-term scenarios, highlighting the importance of non-bank financial institutions in the lending process and their strong ties to small commercial banks' credit distribution. Although interest and exchange rates may not show immediate effects, their long-term stability and high adjustment rates become significant over time. Ultimately, these findings emphasize that credit decisions in small banks are shaped by the steadiness and consistency of long-term influences. Table 5 and Table 6 collectively permit an explicit hypothesis-testing summary. H1 (credit interest rates negatively affect credit disbursement) is supported in the long run (coefficient = −0.424409, p = 0.0149) but not in the short run, where the effect is negative and statistically insignificant (p = 0.1253). H2 (inflation negatively affects credit disbursement) is rejected: inflation shows no significant effect in either the short run (p = 0.7882) or the long run (p = 0.7909), contrary to the hypothesis and the findings of several prior studies. H3 (exchange rates positively affect credit disbursement) is partially supported: the effect is positive and significant in the long run (coefficient = 0.114205, p = 0.0240) but not in the short run (p = 0.9347). H4 (shadow banking positively affects credit disbursement) is fully supported in both the short run (coefficient = 0.685865, p = 0.0000) and long run (coefficient = 0.776842, p = 0.0002). These results are discussed in detail in the following subsections.

Based on the ARDL estimation, the long-term model equation is as follows:

$$\text{Credit Disbursement} = 0.070026 - 0.424409\,\text{Credit Interest Rates} - 0.014252\,\text{Inflation} + 0.114205\,\text{Exchange Rates} + 0.776842\,\text{ShadowBanking} + \varepsilon_t$$

The short-term equations of the ARDL and ECT models are as follows:

$$\begin{aligned}\Delta\text{Credit Disbursement} = {} & 0.061825 + 0.117112\,\text{Credit Disbursement}_{t-1} \\ & - 0.084074\,\text{Credit Interest Rates} - 0.037408\,\text{Credit Interest Rates}_{t-1} \\ & - 0.041102\,\text{Credit Interest Rates}_{t-2} - 0.056899\,\text{Credit Interest Rates}_{t-3} \\ & - 0.155223\,\text{Credit Interest Rates}_{t-4} - 0001483\,\text{Inflation} \\ & + 0.001688\,\text{Exchange Rates} + 0.028406\,\text{Exchange Rates}_{t-1}\end{aligned}$$

$$+0.053906\text{Exchange Rates}_{t-2}+0.008411\text{Exchange Rates}_{t-3}$$
$$+0.034907\text{Exchange Rates}_{t-4}+ 0.685865\text{Shadow Banking}$$
$$-0.882888\text{ECT}_{t-1}+\varepsilon_t$$

4.6. Classical Assumption Test

This test ensures that the regression equation is accurate, unbiased, and consistent (Anindita & Sakti, 2016). According to Table 7, the chi-square probability in the normality test is 0.680484, which is greater than the significance level of α=5 percent. The results indicated that the data were normally distributed. The mean Variance Inflation Factor (VIF), which determines the multicollinearity test, is 1.7548, which is less than 10, indicating that all variables are free from multicollinearity issues.

Table 7. Classical Assumption Test Results

Classical Assumption	Results	Conclusion
Normality	Jarque-Bera test Prob. Chi-Square: 0.680484	Data is normally distributed
Multicollinearity	Mean VIF: 1.7548; Varian Inflation Factor (VIF) < 10	All variables are free from multicollinearity
Heteroscedasticity	Breusch-Pagan-Godfrey Test Prob. Chi-Square: 0.3673	No heteroscedasticity issue
Autocorrelation	Breusch-Godfrey LM test Prob > chi2: 0.1751	No autocorrelation detected

Source: Data Processed (2024)

Table 7 presents the results of the Breusch-Pagan-Godfrey test for heteroscedasticity, with a chi-square probability of 0.3673, which exceeds the 5% significance level. This suggests that there are no concerns regarding heteroscedasticity. Similarly, the Breusch-Godfrey test for autocorrelation yields a chi-square probability of 0.1751, also above the 5% threshold, indicating the absence of autocorrelation.

4.7. Stability Test

The Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests were conducted to evaluate model stability. These tests generate plots with two critical lines at the 5% significance level. If the CUSUM and CUSUMSQ distributions fall within these lines, the model parameters are stable. However, if the distributions cross the critical boundaries, it indicates parameter instability, suggesting that the model may not be reliable.

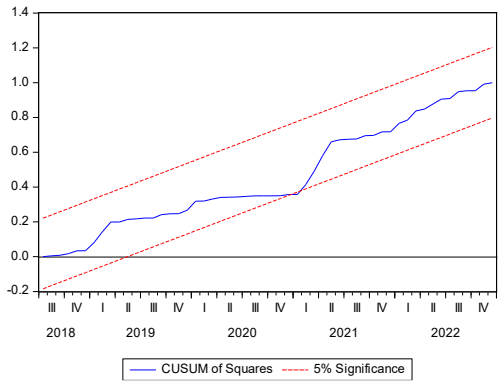

Figure 3. Plot CUSUM

Source: Data Processed (2024)

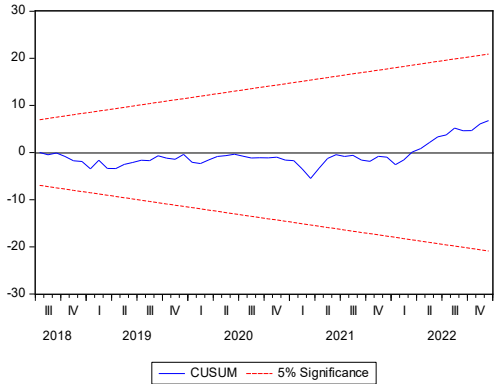

Figure 4. Plot CUSUMSQ

Source: Data Processed (2024)

Figure 3 and Figure 4 display the CUSUM and CUSUMSQ plots from 2018 to 2022. Figure 4 shows that through the CUSUM test, the data distribution fluctuates significantly but never exceeds the critical lines, indicating the stability of the model. Similarly, the CUSUMSQ test shows that the data distribution is stable on average. Although it touched the critical line in December 2020, it quickly adjusted to the stability distribution. These results imply that the model implemented through the ARDL analysis in this study is accurate and robust in assessing the short- and long-term effects of this study.

4.8. The Impact of Credit Interest Rates on Credit Disbursement in Commercial Banks with Core Capital of Less Than IDR 6 Trillion in Indonesia

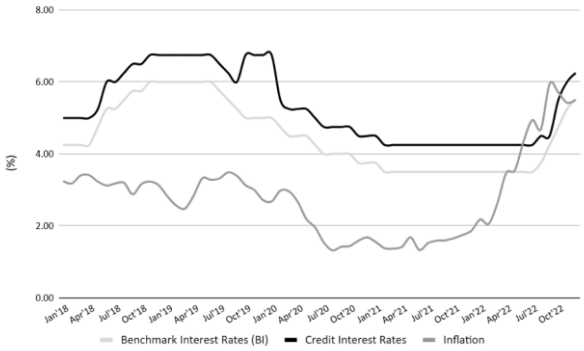

Figure 5. Movements of Credit Interest Rates and Inflation Compared to BI's Benchmark Interest Rates, 2018-2022

Source: Bank Indonesia, 2023 (processed)

The results of the analysis in Figure 5 indicate that credit interest rates do not significantly affect credit disbursement in banks with a small core capital in the short term. However, credit interest rates have a negative and significant impact in the long term, implying that the interest rates set by banks are not the main factor influencing credit disbursement decisions in the short term. However, there is a long-term adjustment.

The absence of a short-term influence is due to the government's Kredit Usaha Rakyat (People's Business Credit, KUR) program, which offers lower credit interest rates than other loans. This financing option is supported by the program's structure and policies, which are designed to support small and micro enterprises. The availability of funds from this program provides broader access for businesses to obtain

capital at more affordable costs. However, implementing the KUR program has been deemed ineffective because it did not increase credit disbursement in some small banks, particularly Regional Development Banks (Lailaa & Kurniawan, 2018; Rini & Aristanto, 2019). These banks did not experience significant changes before and after becoming KUR distributors, which did not impact the increase in credit, non-performing loans, and bank profitability performance. Therefore, short-term credit interest rates are not the main factor in borrowers' decisions to access credit.

Meanwhile, the KUR program has improved with changes to the scheme between 2015 and 2020 and again after 2020. One of the improvements made was the addition of a 0 percent interest rate scheme, initially only having a normal 6 percent interest rate. The addition of a 0 percent interest rate increased the bank's customer base, especially for laid-off workers and housewives. The 0 percent interest rate scheme encouraged higher credit disbursement because debtors trusted it, leading to broader access distribution.

This study aligns with Permata & Dillak (2019), who stated that credit interest rates significantly negatively affect credit disbursement. The lower the credit interest rate, the higher the credit supply banks offer, and the reverse is true. When credit interest rates decrease, debtors experience lower costs of credit repayment, making them more inclined to apply for credit. Thus, credit disbursement increases when credit interest rates decline. These findings imply that Bank Indonesia and the government, as policymakers in the banking sector, play a crucial role in influencing credit disbursement in commercial banks with core capital of less than IDR 6 trillion. Based on these findings, policy stability and evaluation are needed to produce a consistent impact on small-category banks.

4.9. The Impact of Inflation on Credit Disbursement in Commercial Banks with Core Capital of Less Than IDR 6 Trillion in Indonesia

Table 6 and Table 7 show that inflation does not affect credit disbursement in either the short or long term. This result constitutes a rejection of Hypothesis H2, which predicted a negative effect of inflation on credit disbursement, and diverges from the findings of Gabeshi (2021), Bashir & Ibrahim (2020), and Büyükbaşaran et al. (2022). It is important to acknowledge this divergence explicitly, rather than treating the null result as consistent with expectations. This null finding warrants a theoretical reconsideration specific to the KBMI 1 context. One explanation is that inflation rates continued to fluctuate during 2018–2022, including pandemic-induced deflation in 2020, which may have weakened the systematic relationship between aggregate inflation and credit behavior. Inconsistent changes in inflation make it difficult for small banks with limited resources to identify and respond to these patterns.

The Office of the Comptroller of the Currency (OCC) justifies these findings by stating that small banks tend to focus more on the local market and are less responsive to inflation fluctuations. Low inflation does not necessarily affect small banks because of limited credit supply access. Limited access to various financial instruments and money markets makes it challenging for small banks to increase credit disbursement due to the limited number of customers. Additionally, the local market, which tends to have a stable customer base, means that even when inflation rises, small banks do not change their credit disbursement strategy because they have a strong MSME customer base capable of facing unstable economic conditions due to fast transaction cycles, domestic product usage, and direct contact with the primary needs of the society.

Moreover, small banks' lack of responsiveness is due to the higher risks they face if they make incorrect decisions that could affect their assets and liabilities due to the significant capital used in credit supply. Small-category banks tend to be more conservative in disbursing credits. Furthermore, fluctuating inflation tends to decline, indicating a poor consumer purchasing power. Small core capital also limits banks from accessing other sources of income because of limited product diversification. Therefore, banks tend not to adjust credit in response to inflation.

In the long term, inflation does not have a significant impact, indicating that price stability is not the main obstacle to credit disbursement in small-core-capital banks. This finding supports Pratama's (2019) research, which states that banks with small core capital tend to use significant capital to disburse credit compared to banks with large core capital, so they must carefully manage their capital before making

decisions, unlike large banks that tend to adopt defensive strategies by reducing credit disbursement during high inflation.

Research by Ratnasari & Soesatyo (2016) found that regardless of the level of inflation, credit disbursement in large and small banks does not affect credit disbursement because business actors still need production capital regardless of the level of inflation. Although inflation is closely related as one of the factors influencing intermediation activities, for banks with small core capital, other factors such as regulations, credit risk, and overall economic conditions are more dominant in influencing credit disbursement. These findings can serve as a reference for monetary and banking authorities in developing strategies to maintain economic and financial stability for small banks, considering that inflation remains an important macroeconomic variable.

4.10. The Impact of Exchange Rates on Credit Disbursement in Commercial Banks with Core Capital of Less Than IDR 6 Trillion in Indonesia

The regression results show that exchange rates do not significantly affect credit disbursement in the short term. However, in the long term, exchange rates have a positive and significant impact. In the short term, small banks'slow response to exchange rate changes can be explained by their focus on the local market. The community, especially small and medium business actors as customers of small banks, does not immediately feel the significant impact of exchange rate fluctuations, as they are not directly involved in international transactions.

However, in the long term, adjustments occur, where exchange rate fluctuations affect domestic production costs. Exchange rate depreciation makes exports cheaper, and import costs more expensive. The cheaper export returns lead to more competitive local products as people switch to more affordable local products. This condition supports domestic business actors, including MSMEs, in expanding production. Increased production boosts customers' ability to repay loans and increases credit demand. This increases bank assets and liquidity, enabling banks to disburse more credit.

These findings align with Bashir & Ibrahim (2020) and Eltania (2022), who found that exchange rates provide certainty for long-term planning that can increase demand and productivity for banks in disbursing credit due to the elastic impact of exchange rates on credit demand, meaning exchange rate fluctuations significantly influence bank credit demand.

These findings imply that monetary policies are closely related to credit disbursement in small banks. A decrease in the reference interest rate weakens the domestic currency but provides a positive stimulus for community consumption and small banks focused on the domestic market. However, banks must still consider the risks of assets and liabilities in foreign currencies, as small-category banks generally have a proportion of their credit supply in foreign currencies.

4.11. The Impact of Shadow Banking on Credit Disbursement in Commercial Banks with Core Capital of Less Than IDR 6 Trillion in Indonesia

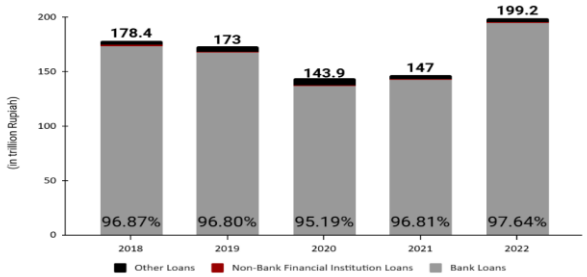

Figure 6. The Proportion of Shadow Banking Financing Sources' Dependency on Other Institutions, 2018-2022

Source: Otoritas Jasa Keuangan, 2023 (processed)

Shadow banking has several sources of loans to support its operations, including banks, non-bank institutions, and other loans. These loans are allocated, among other things, to be reinvested in financing disbursement. Figure 6 shows that over 95 percent of shadow banking loan sources come from bank loans. This indicates a high dependency of financing institutions on banks. Therefore, when shadow banking increases financing disbursement, there is a correlation that bank credit disbursement will increase. This statement is supported by Nath & Chowdhury (2021), who said that shadow banking and commercial banks have a complementary relationship. Thus, the above statement supports that shadow banking positively and significantly impacts credit disbursement. These results show that if there is an increase in shadow banking, it will significantly impact the increase in credit disbursement.

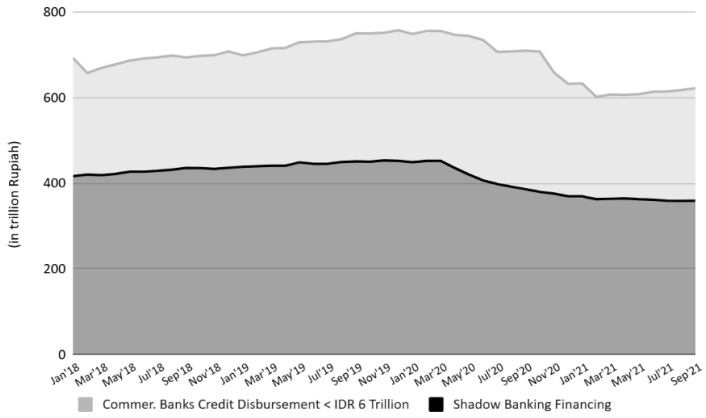

Figure 7. Movement in Small Commercial Bank Credit Disbursement and Shadow Banking Financing, 2018-2021

Source: Otoritas Jasa Keuangan, 2022 (processed)

Figure 7 also shows the similar movement of credit disbursement between the two, indicating that small banks have significantly contributed to the growth of shadow banking in Indonesia since early 2018. These findings align with Sun (2019) findings that shadow banking positively affects credit disbursement. However, market discipline theory is less aligned with the condition of Indonesia's financial system, especially small banking systems. This requires theoretical elaboration. Market discipline theory posits that shadow banking competes with traditional banks, undermining deposit-holder discipline and pushing banks toward riskier credit standards. This mechanism presupposes that shadow banking entities operate independently of — and in competition with — commercial banks for funding and borrowers. However, Figure 6 shows that over 95 percent of shadow banking loan sources in Indonesia come from bank loans themselves, meaning the relationship is one of financial interdependence rather than competition. In this structural context, shadow banking functions as a downstream credit channel: banks lend to IKNB entities, which then disburse financing to end borrowers, effectively extending commercial bank credit reach. This mutualistic, complementary arrangement — more consistent with banking credit creation theory — explains why the positive direction of shadow banking's influence is observable. Among the four theoretical frameworks presented in the literature review, credit creation theory and monetary policy transmission theory provide the strongest explanatory purchase for KBMI 1 banks, while market discipline theory appears empirically constrained in this context. Nath & Chowdhury's (2021) research supports this study. Shadow banking positively and significantly impacts bank credit disbursement because both are interdependent and share risks by assisting in financing credit supply.

The discussion shows a complex relationship between microeconomic, macroeconomic, and non-bank financial institution variables with small-core-capital commercial banks. Although credit interest rate policies and monetary policies tend to be less flexible in the short term due to fluctuations and inconsistencies, government policies impact small banks. These policies provide benefits and impacts for small banks in credit expansion. On average, from 2018 to 2022, the non-performing loan (NPL) ratio of

small banks ranged from 2.58 percent to 3.93 percent, which is below the healthy NPL standard for banking in Indonesia (5 percent). Indicates that small banks in Indonesia have healthy credit, resilience to crises, and good management capabilities. Therefore, the synergistic relationship between government policies, the financial stability of small banks, and economic conditions positively influences sustainable credit disbursement.

4.12. Research Limitation

The focus on external factors limits this research. Future studies could incorporate internal factors, such as bank performance ratios or other relevant metrics, and extend the research period while including additional economic variables. This research also emphasizes the importance of identifying alternative monetary and financial policies in future studies to enhance bank credit distribution, considering the crucial role of the banking and financial system in driving Indonesia's economic growth. More specifically, four important limitations should be acknowledged. First, the 38 selected banks were aggregated into a single monthly time series of credit disbursement, which discards cross-bank heterogeneity. Differences in business model, regional focus, asset quality, and management capacity across KBMI 1 banks may influence credit disbursement in ways that a single aggregate time series cannot capture. Future research using panel data methods could address this limitation and provide more granular insights. Second, the study period (January 2018 to December 2022) includes the COVID-19 pandemic years of 2020 and 2021, during which credit disbursement, inflation, and exchange rates were all subject to extraordinary disruptions — including government credit guarantee programs, BI rate cuts, and global demand shocks. These structural breaks may distort the estimated long-run coefficients and reduce the generalizability of the findings to non-crisis conditions. Stability tests suggest the model remained within bounds, but the COVID-19 period nonetheless introduces parameter uncertainty that future studies should address through structural break testing or sub-period analysis. Third, the model omits internal bank-level variables that prior literature has identified as important determinants of credit disbursement, including Capital Adequacy Ratio (CAR), Non-Performing Loan (NPL) ratio, Loan-to-Deposit Ratio (LDR), and asset quality measures. These omitted variables may partly account for the 47.2 percent of variation in credit disbursement that the present model does not explain ($R^2 = 0.528$). Fourth, while the R^2 of 0.528 confirms that the included variables collectively have significant explanatory power, the substantial unexplained variation underscores that the model is intentionally parsimonious and should not be interpreted as a complete account of KBMI 1 credit dynamics. Future studies expanding the variable set and using panel estimation are encouraged.

5. CONCLUSION

This study analyzes the short-term and long-term effects of credit interest rates, inflation, exchange rates, and shadow banking on credit disbursement at commercial banks with core capital of less than IDR 6 trillion in Indonesia. Using the Autoregressive Distributed Lag (ARDL) method and monthly time series data from January 2018 to December 2022, several significant findings were found. First, credit interest rates do not significantly influence credit disbursement in the short term. However, in the long term, credit interest rates have a negative and significant impact. This is due to the gradual improvement in the efficiency and competitiveness of small banks through the KUR, which affects their credit disbursement in the long run. Second, inflation does not significantly affect credit disbursement in the short and long term. This finding suggests that price stability is not the main factor in small banks' credit disbursement decisions. Small banks seem more influenced by other factors when determining their credit policies. Third, the effect of the exchange rate on credit disbursement varies between the short and long term. The exchange rate does not have a significant effect in the short term. However, in the long term, the exchange rate positively and significantly affects credit disbursement. This happens because the customer base of small banks is not directly involved in international transactions, so the impact of the exchange rate is not immediately felt in the short term. However, over time, exchange rate changes affect domestic production costs and the local market, ultimately impacting small banks' credit disbursement. Fourth, shadow banking is the most crucial variable in this study. The analysis's results show that non-bank financial institutions

significantly contribute to the credit disbursement of small banks in the short and long term. The positive and significant influence of shadow banking highlights the importance of non-bank financial institutions' role in supporting small banks' credit disbursement.

Based on these findings, this study recommends several expansive and synergistic policies for banks with small core capital: 1) Product and service diversification needs to be increased to reduce dependence on credit and address macroeconomic fluctuations. Diversifying can also enhance small banks' access to financial instruments and money markets. 2) Economic stimulus at the local level is essential. Policies supporting local sectors, such as MSMEs, can drive the growth of small banks' credit disbursement. This includes the sustainability of MSME credit interest subsidies, local credit guarantee programs, and flexible credit rules. 3) Collaboration with non-bank financial institutions must be strengthened to create productive and sustainable synergies.

However, there must be a framework and supervision from OJK and Bank Indonesia to manage the risks taken by non-bank financial institutions. Additionally, the stability of microeconomic and macroeconomic policies needs to be maintained. Consistency in the benchmark interest rate will impact credit interest rates, moderate inflation, and stable exchange rates. The stability of these three variables will provide long-term certainty for small banks in assessing the strength of the financial system and determining credit disbursement strategies. Price and exchange rate stability are expected to create a conducive economic environment for small banks to conduct sustainable risk management, considering that banks with small core capital are more vulnerable to risks than banks with large core capital.

Ethical Approval

Not applicable

Informed Consent Statement

Not applicable because this study did not involve human participants.

Authors' Contributions

SA: conceptualization, investigation, data curation, formal analysis, and writing – original draft; FWP: methodology, supervision, validation, and writing – review and editing; both authors: final manuscript review and approval.

Disclosure Statement

The author declares no potential conflict of interest.

Data Availability Statement

No primary dataset was generated for this study. All materials analyzed are available in the published sources cited in the reference list.

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REFERENCES

Abdel Rahim, E. J. (2019). The impact of macroeconomic variables on the credit provided by Saudi banks. *Journal of Economic, Administrative and Legal Sciences, 3*(3), 108–120. https://doi.org/10.26389/AJSRP.E281118

Ai, H., Li, K., & Yang, F. (2020). Financial intermediation and capital reallocation. *Journal of Financial Economics, 138*(3), 663–686. https://doi.org/10.1016/j.jfineco.2020.06.017

Anindita, R. D., & Sakti, R. K. (2016). Analisis pengaruh faktor eksternal dan internal perbankan terhadap besaran suku bunga kredit investasi di Indonesia (An analysis of the influence of external and internal banking factors on the investment lending rate in Indonesia). *Jurnal Ilmiah Mahasiswa FEB Universitas Brawijaya, 4*(2). https://jimfeb.ub.ac.id/index.php/jimfeb/article/view/2936

Ari, A., Darracq-Paries, M., Kok, C., Żochowski, D., & Martinez Peria, M. S. (2017). *Shadow banking and market discipline on traditional banks* (IMF Working Paper No. 17/285). International Monetary Fund. https://doi.org/10.5089/9781484335376.001

Asian Development Bank. (2022, April 6). *Pertumbuhan ekonomi Indonesia akan menguat pada 2022, 2023—ADB (Indonesia's economic growth to strengthen in 2022, 2023—ADB).* https://www.adb.org/id/news/indonesia-economic-growth-strengthen-2022-2023-adb

Badan Pusat Statistik. (n.d.-a). *Produk domestik bruto menurut lapangan usaha (Gross domestic product by industry).* Retrieved May 19, 2026, from https://www.bps.go.id/subject/11/produk-domestik-bruto--lapangan-usaha-.html#subjekViewTab3

Badan Pusat Statistik. (n.d.-b). *Laju pertumbuhan PDB seri 2010 (GDP growth rate, 2010 series).* Retrieved May 19, 2026, from https://www.bps.go.id/id/statistics-table/2/MTA0IzI=/pertumbuhan-ekonomi--triwulan-iii-2023.html

Bank Indonesia. (2004). *Booklet perbankan Indonesia (Indonesian banking booklet).* https://www.bi.go.id/id/publikasi/perbankan-dan-stabilitas-keuangan/booklet-perbankan-indonesia/Default.aspx

Bank Indonesia. (2019, November 21). *BI 7-day reverse repo rate tetap 5,00%, GWM rupiah turun 50 bps: Menjaga momentum pertumbuhan, mempertahankan stabilitas (BI 7-day reverse repo rate remains 5.00%, rupiah reserve requirement drops 50 bps: Maintaining growth momentum and stability).* https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/SP_218219.aspx

Bank Indonesia. (2021). *Laporan perekonomian Indonesia 2021 (Indonesia economic report 2021).* https://www.bi.go.id/id/publikasi/laporan/Pages/LPI_2021.aspx

Bank Indonesia. (2022a). *Survei perbankan triwulan IV 2022 (Fourth quarter banking survey 2022).* https://www.bi.go.id/id/publikasi/laporan/Pages/Survei-Perbankan-TwIV-2022.aspx

Bank Indonesia. (2022b, December). *Survei permintaan dan penawaran pembiayaan perbankan Desember 2022: Penyaluran kredit perbankan terindikasi meningkat (December 2022 banking financing supply and demand survey: Banking lending indicated to increase).* https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/sp_251223.aspx

Bank Indonesia. (2013). *Peraturan Bank Indonesia Nomor 15/12/PBI/2013 tentang Kewajiban Penyediaan Modal Minimum Bank Umum (Bank Indonesia Regulation Number 15/12/PBI/2013 concerning minimum capital requirements for commercial banks).* Otoritas Jasa Keuangan. https://ojk.go.id/id/regulasi/pages/pbi-tentang-kewajiban-penyediaan-modal-minimum-bank-umum.aspx

Barra, C., & Ruggiero, N. (2021). Do microeconomic and macroeconomic factors influence Italian bank credit risk in different local markets? Evidence from cooperative and non-cooperative banks. *Journal of Economics and Business, 114*, Article 105976. https://doi.org/10.1016/j.jeconbus.2020.105976

Bashir, M. S., & Ibrahim, A. A. A. (2020). Effects of macroeconomic variables on bank credit in Saudi Arabia: An ARDL bounds testing approach to cointegration. *Asian Journal of Economics, Business and Accounting, 19*(2), 1–12. https://doi.org/10.9734/ajeba/2020/v19i230298

Büyükbaşaran, T., Karasoy-Can, G., & Küçük, H. (2022). Macroeconomic effects of bank lending in an emerging economy: Evidence from Turkey. *Economic Modelling, 115*, Article 105946. https://doi.org/10.1016/j.econmod.2022.105946

Cappelletti, G., Marques, A. P., Varraso, P., Budrys, Ž., & Peeters, J. (2019). *Impact of higher capital buffers on banks' lending and risk-taking: Evidence from the euro area experiments* (ECB Working Paper No. 2292). European Central Bank. https://doi.org/10.2866/786804

Chinenye, A. C., & Acha, C. K. (2018). Application of auto-regressive distributed lag model (ARDL) bound test on selected macroeconomic variables. *Quantitative Economics Research, 1*(2), 79–86. https://journal2.um.ac.id/index.php/qer/article/download/5535/3174

Dasih, K. (2021). *Bank capital and the credit crunch: Does capital play a role in the credit crunch in the pandemic era?* Bank Indonesia. https://www.bi.go.id/id/publikasi/ruang-media/news-release/Documents/Juara_3_-_LKISSK_2021_-_Kuntari_Dasih.pdf

De Jonghe, O., Dewachter, H., & Ongena, S. (2020). Bank capital requirements and credit supply: Evidence from pillar 2 decisions. *Journal of Corporate Finance, 60*, Article 101518. https://doi.org/10.1016/j.jcorpfin.2019.101518

Eltania, M. N. (2022). Pengaruh suku bunga kredit, inflasi, dan nilai tukar terhadap jenis penyaluran kredit (The effect of lending interest rates, inflation, and exchange rates on types of lending). *Contemporary Studies in Economic, Finance and Banking, 1*(1), 25–37. https://doi.org/10.21776/csefb.2022.01.1.03

Freimanis, K., & Senfelde, M. (2019). Credit market development in Latvia: Determinants and challenges. *Business, Management and Economics Engineering, 17*(1), 1–19. https://doi.org/10.3846/bme.2019.9728

Gabeshi, K. (2021). Credit growth determinants in Romania. *Revista Economică, 73*(Special Issue), 188–198. https://ideas.repec.org/a/blg/reveco/v73y2021ispecialp188-198.html

Hamid, H. A. (2019). Analisis pengaruh kredit perbankan, pembiayaan perbankan syariah, jumlah tenaga kerja dan indeks pembangunan manusia terhadap pertumbuhan ekonomi: Studi pada 33 provinsi di Indonesia (An analysis of the effect of banking credit, Islamic banking financing, total labor, and human development index on economic growth: A study of 33 provinces in Indonesia). *Jurnal Ilmiah Mahasiswa FEB Universitas Brawijaya, 8*(1). https://jimfeb.ub.ac.id/

Hourani, M., & Mondello, G. (2021). *The impact of bank capital and institutional quality on lending: Empirical evidence from the MENA region*. HAL Open Science. https://shs.hal.science/halshs-03502606

International Monetary Fund. (2017). *Global financial stability report: Is growth at risk?* https://www.imf.org/en/Publications/GFSR/Issues/2017/09/27/global-financial-stability-report-october-2017

Klein, P. O., & Turk-Ariss, R. (2022). Bank capital and economic activity. *Journal of Financial Stability, 62*, Article 101068. https://doi.org/10.1016/j.jfs.2022.101068

Kodres, L. (2019). *Shadow banking: Out of the eyes of regulators*. International Monetary Fund. https://www.imf.org/en/Publications/fandd/issues/Series/Back-to-Basics/Shadow-Banks

Lailaa, N., & Kurniawan, E. P. (2018). Penyaluran kredit usaha rakyat bagi kinerja bank pembangunan daerah (Distribution of Kredit Usaha Rakyat for the performance of regional development banks). *Jurnal Ekonomi dan Bisnis, 21*(1), 23–42. https://ejournal.uksw.edu/jeb/article/view/633

Liang, Y. (2016). Inside shadow banking in China: Credit driven growth vs. financial stability. *Journal of Economic Issues, 50*(2), 461–470. https://doi.org/10.1080/00213624.2016.1179046

Munangi, E., & Sibindi, A. B. (2022). Fintech, bigtech credit and economic growth: A bibliometric review and meta-analysis. *Journal of Risk Analysis and Crisis Response, 12*(4), 204–221. https://doi.org/10.54560/jracr.v12i4.344

Nath, R. D., & Chowdhury, M. A. F. (2021). Shadow banking: A bibliometric and content analysis. *Financial Innovation, 7*(1), Article 72. https://doi.org/10.1186/s40854-021-00286-6

Office of the Comptroller of the Currency. (2021). *Bank performance under an inflation scenario*. https://www.occ.gov/publications-and-resources/publications/economics/insights/2021/bank-performance-under-an-inflation-scenario.html

Oktaviana, N. K. (2022). Analisis DPK, suku bunga, pendapatan terhadap kredit modal kerja perbankan masa pandemi (An analysis of deposits, interest rates, and income on banking working capital loans during the pandemic). *Contemporary Studies in Economic, Finance and Banking, 1*(1), 73–84. https://doi.org/10.21776/csefb.2022.01.1.07

Omar, W. A. W., Al-Towati, N. O., & Amlus, H. (2020). The impact of the credit crunch and shadow economy on economic growth in Libya: Evidence from ARDL. *Saudi Journal of Economics and Finance, 4*(1). https://doi.org/10.36348/sjef.2020.v04i01.007

Otoritas Jasa Keuangan Indonesia. (n.d.-a). *Statistik perbankan Indonesia (Indonesian banking statistics)*. Retrieved May 19, 2026, from https://www.ojk.go.id/id/kanal/perbankan/data-dan-statistik/statistik-perbankan-indonesia/Default.aspx

Otoritas Jasa Keuangan Indonesia. (n.d.-b). *Statistik IKNB (Non-bank financial industry statistics)*. Retrieved May 19, 2026, from https://www.ojk.go.id/id/kanal/iknb/data-dan-statistik/statistik-iknb/Default.aspx

Otoritas Jasa Keuangan Indonesia. (2021). *Peraturan Otoritas Jasa Keuangan Nomor 12/POJK.03/2021 tentang kewajiban penyediaan modal minimum bank umum (OJK Regulation Number 12/POJK.03/2021 on minimum capital requirements for commercial banks)*. https://www.ojk.go.id/id/regulasi/Documents/Pages/Bank-Umum/POJK%2012%20-%2003%20-2021.pdf

Otoritas Jasa Keuangan Indonesia. (2022). *Statistik lembaga pembiayaan/Multifinance institutions statistics 2022 (Financing institutions statistics 2022)*. https://www.ojk.go.id/id/kanal/iknb/data-dan-statistik/lembaga-pembiayaan/Documents/Pages/Buku-Statistik-Lembaga-Pembiayaan-2022/Buku%20Statistik%20Lembaga%20Pembiayaan%202022_.pdf

Permata, A. L., & Dillak, V. J. (2019). Pengaruh return on assets, suku bunga kredit, inflasi, dan non-performing loan terhadap penyaluran kredit perbankan (The effect of return on assets, lending interest rates, inflation, and non-performing loans on banking lending). *E-Proceeding of Management, 6*(2).

Pesaran, M. H. (2008). An autoregressive distributed-lag modelling approach to cointegration analysis. In S. Strøm (Ed.), *Econometrics and economic theory in the 20th century: The Ragnar Frisch Centennial Symposium* (pp. 371–413). Cambridge University Press. https://doi.org/10.1017/CCOL0521633230.011

Pratama, A. A. P. (2019). Capital and lending growth of banking sector in Indonesia: Study on the BUKU category. *Jurnal Keuangan dan Perbankan, 23*(4), 489–502. https://doi.org/10.26905/jkdp.v23i4.3401

Purba, A. S. A., & Sakti, R. K. (2022). Pengaruh faktor makroekonomi terhadap tingkat kredit bank serta implikasinya pada kesehatan perbankan (The influence of macroeconomic factors on bank credit level and its implications for banking health). *Contemporary Studies in Economic, Finance and Banking, 1*(3). https://doi.org/10.21776/csefb.2022.01.3.11

Ratnasari, N., & Soesatyo, Y. (2016). *Variabel-variabel yang mempengaruhi penyaluran kredit kepada UMKM oleh perbankan di Indonesia tahun 2011–2015 (Variables affecting lending to MSMEs by banks in Indonesia in 2011–2015)*. Universitas Negeri Surabaya Institutional Repository.

Rifawati, B. N. (2021). Influence of competition and shadow banking on banking profitability in Indonesia. *International Journal of Economics, Business and Accounting Research, 5*(2). https://jurnal.stie-aas.ac.id/index.php/IJEBAR

Rini, R. S., & Aristanto, E. (2019). Pengaruh penyaluran kredit usaha rakyat (KUR), tingkat suku bunga terhadap kinerja keuangan bank pembangunan daerah melalui non-performing loan (NPL) & biaya operasi dan pendapatan operasi (BOPO): Studi kasus BPD DKI Jakarta, BPD DI Yogyakarta dan BPD Jawa Timur (The effect of KUR distribution and interest rates on regional development banks' financial performance through NPL and BOPO: A case study of BPD DKI Jakarta, BPD

DI Yogyakarta, and BPD Jawa Timur). *Jurnal Akuntansi Berkelanjutan Indonesia, 2*(2). https://repository.bsi.ac.id/repo/24802/

Setiawan, A., Sudarto, S., & Widiastuti, E. (2021). The influence of credit risk and liquidity risk on bank stability. *Icore Journal of Business and Economics, 5*(2). http://jp.feb.unsoed.ac.id/index.php/Icore/article/viewFile/1687/1620

Setiawan, S. M. (2021). *Pengaruh faktor makroekonomi terhadap pertumbuhan kredit perbankan (The effect of macroeconomic factors on banking credit growth)* [Undergraduate thesis, Universitas Sebelas Maret]. Universitas Sebelas Maret Institutional Repository. https://digilib.uns.ac.id/dokumen/detail/99291/Pengaruh-Faktor-Makroekonomi-terhadap-Pertumbuhan-Kredit-Perbankan

Sieron, A. (2018). The role of shadow banking in the business cycle. *Austrian Economics, Freedom, and Finance Journal*. Mises Institute. https://mises.org

Starkey, M. (2018). *Credit creation theory of banking*. The Economics Network, Sheffield Hallam University. http://shura.shu.ac.uk/23013/

Sun, G. (2019). *China's shadow banking: Banks' shadow and traditional shadow banking* (BIS Working Paper No. 822). Bank for International Settlements. https://www.bis.org/publ/work822.htm

Tinoco-Zermeño, M. Á., Torres-Preciado, V. H., & Venegas-Martínez, F. (2022). Inflation and bank credit. *Investigación Administrativa, 51*(129), 1–21. https://doi.org/10.35426/iav51n129.02

Tjaru, I. P. B. (2021). Pengaruh variabel makroekonomi terhadap pertumbuhan kredit pada bank umum di Indonesia tahun 2003–2019 (The effect of macroeconomic variables on credit growth at commercial banks in Indonesia in 2003–2019). *Jurnal Ilmiah Mahasiswa FEB Universitas Brawijaya, 9*(2). https://jimfeb.ub.ac.id/index.php/jimfeb/article/download/7158/6280

World Bank. (2019). *Global financial development report 2019/2020: Bank regulation and supervision a decade after the global financial crisis*. World Bank Group. https://doi.org/10.1596/978-1-4648-1453-4

Wulandari, E. P., & Ismail, M. (n.d.). *Transmisi kebijakan moneter melalui jalur kredit perbankan dalam mencapai sasaran akhir inflasi periode 2005:Q1–2014:Q4 (Monetary policy transmission through the bank credit channel in achieving the final inflation target for the period 2005:Q1–2014:Q4)*. https://jimfeb.ub.ac.id/index.php/jimfeb/article/view/1955