Article Type: Research Paper

Effectiveness of Macroprudential Policy on Banking Credit Growth in Indonesia (2015-2023)

Marita Asri Cendani* and Inda Fresti Puspitasari

Abstract: The COVID-19 pandemic shows that macroprudential policy is one of the crucial instruments in mitigating economic shocks and ensuring the financial system. This study examines the effectiveness of macroprudential policies on banking credit growth in Indonesia from 2015 to 2023 by analyzing the impact of the Debt-to-Income Ratio (DTI), Minimum Reserve Requirement (GWM), Capital Adequacy Ratio (CAR), and Non-Performing Loans (NPL). This study aims to give regulators insights into optimizing policy combinations to mitigate financial risks while supporting sustainable economic growth. The results of panel data regression revealed that DTI and CAR significantly impact banking credit growth. In contrast, GWM and NPL didn't have a significant effect. These findings emphasize the critical role of macroprudential policies in maintaining a balance between credit growth and financial stability, especially in times of economic uncertainty. This study contributes to policymakers and financial regulators optimizing macroprudential frameworks to enhance financial resilience and support sustainable credit distribution in Indonesia's banking sector.

Keywords: Macroprudential Policy; Banking Credit Growth; Financial Stability; Global Financial Crisis
JEL Classification: G21; G28; G510

AFFILIATION:
Development Economics Study Program, Faculty of Economics and Business, Universitas Muhammadiyah Surakarta, Central Java, Indonesia

***CORRESPONDENCE:**
maritaasricendani@gmail.com

THIS ARTICLE IS AVAILABLE IN:
http://journal.umy.ac.id/index.php/jerss

DOI: 10.18196/jerss.v9i2.26548

CITATION:
Cendani, M. A., & Puspitasari, I. F. (2025). Effectiveness of Macroprudential Policy on Banking Credit Growth in Indonesia (2015-2023). *Journal of Economics Research and Social Sciences, 9*(2), 184-202.

ARTICLE HISTORY
Received:
2025-04-15
Revised:
2025-04-30
Accepted:
2025-05-19

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

Introduction

Macroprudential policy has gained significant attention from authorities since the 2008 financial crisis, becoming a key instrument for ensuring long-term economic stability (Nakatani, 2020). The global financial crisis opened up awareness among many parties about the importance of maintaining financial system stability and price stability. It happened because financial system instability can significantly impact macroeconomic stability, even though inflation is at a low and controlled level (Chadwick, 2018). In addition, according to information published on Bank Indonesia's official website [1], global and domestic economic instability in 2015, which continued until the first quarter of 2016, had a significant impact on Indonesia's financial system. In response to these issues, Bank Indonesia applies macroprudential policies that are measurable, cohesive, and synchronized with both monetary policy and the payment system. This policy aims to maintain financial system stability

[1] https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/BI-Dukung-Stabilitas-Sistem-Keuangan-melalui-Kebijakan-Makroprudensial.aspx

while encouraging sustainable economic growth. The role of these policies becomes particularly evident in the real estate sector, where macroeconomic factors such as GDP, inflation, and interest rates influence property prices. GDP, used as a proxy for income, has a negative impact on residential property prices in Indonesia. At the same time, inflation exerts a positive effect on property prices. There is a difference in the impact of domestic interest rates on property prices where there is a direct effect on domestic interest rates, followed by the COVID-19 crisis. On the other hand, foreign interest rates have short-term adverse and long-term positive effects. This study suggests that robust monetary policy through interest rates can help sustain public expectations, particularly regarding property prices (Kurniawan et al., 2023).

The widespread COVID-19 crisis in 2020 has made macroprudential policy receive global attention again. The main goal of macroprudential policy is to prevent financial instability, such as banking crises (Nakatani, 2020). Macroprudential instruments can effectively regulate bank loans, although their effectiveness can fluctuate in the business cycle. Therefore, macroprudential policy has a strong and positive relationship with bank lending during the easing cycle. On the other hand, tighter policies will hurt bank loans, although the impact is negligible. These findings are especially relevant in the ongoing crisis caused by COVID-19, as policymakers aim to stimulate the economy by relaxing macroprudential regulations to ensure credit flow to the real sector (Ćehajić & Košak, 2022). According to Winarso and Jaya (2023), macroprudential policies play an essential role in maintaining the sustainability of the banking sector in Indonesia, especially during difficult times due to the COVID-19 pandemic. Overall, this policy intends to support financial sector stability in Indonesia by considering two important aspects: cross-section that pays attention to various sectors simultaneously, and time series that considers changes over time. While macroprudential policies may not be well-received by the public, they are essential to mitigate systemic risks that may endanger the stability of Indonesian banks. This policy is expected to make the banking sector more resilient in facing various challenges that may arise in the future.

Based on the data obtained from the official Perhimpunan Bank Nasional's (Perbanas) website[2], during the post-COVID-19 pandemic, credit growth in Indonesia showed a significant recovery. In 2021, the credit growth rate was negative at 3.77% (yoy), but in 2023, it jumped to around 10% (yoy). In addition, liquidity has also experienced a significant improvement, as shown by third-party funds (DPK) growth, which continued to increase from 2020 to 2022. This abundant liquidity allows banking intermediation and post-pandemic economic recovery to be smoother. One of the indicators is the still strong growth of consumer loans, which reached 8.9% (yoy) in 2023. This condition indicates a recovering trend in consumer purchasing power, in line with the increasing credit growth post-pandemic period. This recovery positively impacts the real sector, as the rising demand for goods and services encourages companies to increase their production and distribution capacity. In addition, the pandemic has also impacted consumer behavior and preferences, prompting companies to invest more in technology and innovation to adapt

[2] https://perbanas.org/uploads/pustaka/1711444367-Buku_Outlook%20Perbanas%202024%20-digital.final.pdf

to change. Many companies borrow from banks to finance these projects, thus contributing to overall credit growth. In 2023, investment loans and working capital grew by 11% (yoy) and 10.7% (yoy), respectively. This shows that there has been an increase in economic activity and investment in various sectors post-pandemic.

The role of banking is that of a vital financial institution that regulates the traffic flow of the financial system, economic control, distribution, and circulation of funds in the community in economic development efforts. The critical role of banking has positioned the banking system as one of the systems that is vulnerable to changes in the global cycle, as evidenced by the failure of banks in the world to face *the domino effect* of banking in the United States in 2008/2009, also known as *the global financial crisis*. According to Sugema (2012), the 2008 crisis occurred due to *excessive credit,* which led to systemic failure in the United States. Banks in Indonesia also felt the impact of this crisis, including a decrease in liquidity, a decline in the stock price index, a balance of payments deficit, and exchange rate depreciation. In addition, according to Ardely and Sofyan (2016), the economic crisis experienced by the United States in 2008 due to the increase in the number of loans in the high-risk property sector has caused financial system instability, the magnitude of credit interest rates, and a decline in the percentage of GDP growth in the United States. The United States used monetary policy instruments to address the current economic crisis and reduce high-risk credit in the property sector. However, this policy has other impacts such as a decrease in the purchasing power of the United States people, increasing unemployment, and so on. This incident proved that monetary policy alone cannot overcome the economic crisis caused by financial system instability. The 2008 financial crisis indicates that ensuring economic stability alone is insufficient to achieve price stability; maintaining the financial system's stability is equally essential. While price stability is reflected through low inflation and interest rates, financial system stability refers to the system's ability to absorb shocks without hindering the allocation of savings to investments or the smooth functioning of payment processes within the economy. Like other developing countries, Indonesia does not have many alternative forms of investment financing, so the banking sector's role is still dominant in the financial sector. Bank credit is the main activity of the banking industry in the financial market. It is the most important source of external capital for companies. Banking loans or credit influence consumer spending, investment, and economic growth. Therefore, when bank debt decreases, the reduction of bank debt can be an essential factor in causing an economic recession (Pratiwi & Hindasah, 2014).

Analysis about macroprudential policy stability in Indonesia has been carried out by several previous studies, such as Ardely and Syofyan (2016) which shows that the macroprudential policies implemented by the government since June 2012 with the *Loan to Value* (LTV) instrument have proven to be effective in controlling the growth of property loans, especially Home Ownership Loans (KPR) and Apartment Ownership Loans (KPA) in Indonesia have proven to be very effective. The application of LTV regulates the maximum limit of the comparison between the amount of loans that banks can provide and the value of the property used as collateral. This policy aims to prevent excessive credit disbursement and maintain financial stability, especially in the real estate sector, which is prone to speculation. The positive impact of this policy can be seen in the ability

of LTV instruments to contain real estate credit growth, ensure healthy and controlled credit growth, and reduce potential risks in the banking sector. Over the years, this policy has been an essential tool for regulators to balance driving economic growth and managing financial risks in Indonesia.

On the other hand, Matos et al. (2024) highlighted that overlooking the link between macroprudential policy and investor protection may result in misleading conclusions regarding the overall effectiveness of such policies. In other words, macroprudential policy's impact analysis and outcomes can be severely distorted without understanding these trade-offs. In addition, shareholders and creditors have a vital role in determining a bank's risk behavior, especially when adapting to changes in the new prudential policy environment. This means that strong investor protection affects the bank's decisions and how it implements its management practices in the context of risk and investment decisions.

According to information obtained from the official website of Bank Indonesia[3], which refers to the G-20 Working Group report, macroprudential policy refers to measures designed to enhance the overall resilience of the financial sector in maintaining systemic risks arising from the failure of financial institutions or markets that have the impact of causing crises that are detrimental to the economy. There are three key sentences to describe macroprudential policy, which consist of (1) applied intending to maintain financial system stability; (2) applied with a *system-wide perspective;* and (3) implemented through efforts to limit the build-up of systemic risks. In simple terms, macroprudential policy is the application of the prudential principle to the financial system to maintain a balance between macroeconomic and microeconomic objectives (Bank Indonesia, 2016). Systemic risk is defined as a risk that can result in a loss of public trust and an increase in uncertainty in the financial system, so that the financial system cannot function properly and disrupt the course of the economy. Systemic risks can occur suddenly and unexpectedly, or slowly without being noticed or detected by various parties, so appropriate policies can be implemented too late. The adverse effects of systemic risks on the economy can be seen from the increasing disruptions to the payment system, credit flows, and the decline in asset values (G-10, 2001). According to *the Committee on the Global Financial System* (Committee on the Global Financial System, 2012), the macroprudential policy transmission mechanism includes liquidity- and credit-based instruments. The primary purpose of this transmission mechanism is to dampen the rate of credit growth and strengthen bank resilience. Liquidity-based instruments also impact credit and can increase the strength of banks (financial institutions). In its explanation, *the Committee on the Global Financial System* stated that the tightening of liquidity-based instruments will encourage banks to adjust the condition of their internal factors, such as assets and liabilities, by replacing short-term funding sources with long-term funding, replacing less secure funding sources, and converting less liquid assets into more liquid ones. The time-varying *Macroprudential Policies* currently implemented by Bank Indonesia are *the Countercyclical Capital Buffer* (CCB), Macroprudential Intermediation Ratio, and Macroprudential Liquidity Buffer (PLM). Macroprudential

[3] https://www.bmeb-bi.org/index.php/BEMP/article/download/511/879

Policy Instruments are designed to mitigate risk dynamics over time. They aim to address the procyclical behavior of financial institutions and market participants. The purpose of macroprudential policy instruments is to increase the resilience of financial institutions and financial actors by ensuring that when conditions deteriorate, they have the resilience to absorb increased risks and prevent excessive risk-taking behavior when economic conditions are good. Macroprudential policy has an intermediate and final goal. The goal of macroprudential policy is to monitor and assess the financial system as a whole, and the ultimate goal of macroprudential policy is to reduce the cost of the crisis (Ardely & Syofyan, 2016).

Reserve requirement (GWM) is the minimum deposit that must be maintained by the Bank in the form of a current account balance at Bank Indonesia, which is set by Bank Indonesia in the amount of a certain percentage of deposits or third-party funds (PBI No.6/15/PBI/2004). The amount is calculated based on the difference between the LFR (*Loan-to-Funding Ratio*) owned by the bank and the target LFR. This policy was developed to reduce potential systemic risks by controlling the banking intermediation function, following economic growth capacity and targets, and maintaining banking liquidity. Therefore, this policy is expected to encourage the creation of a balanced and quality intermediation function while maintaining the stability of bank liquidity. Policies related to reserve requirements are regulated in Bank Indonesia Regulation No. 17/11/PBI/2015, as an amendment to PBI No. 15/15/PBI/2015 concerning the Minimum Mandatory Current Requirement of Commercial Banks in Rupiah and Foreign Exchange for Conventional Commercial Banks (Bank Indonesia, 2016). Reserve requirements are an indirect monetary policy instrument because the policy aims to influence money market conditions. This instrument stabilizes the amount of money circulating in the community. According to an explanation on the official website of *the Consumer Financial Protection Bureau* (CFPB)[4], the debt-to-income ratio (DTI) is a comparison between all monthly debt payments and monthly gross income. This figure is used by lenders to assess their ability to manage monthly payments to pay off loans that borrowers will submit. The official OCBC website explains that DTI is one of the ways banks usually use to consider whether customers are eligible for loans. The purpose of the DTI instrument is to ensure the quality of assets at the bank (Sabrina Audya, 2023). According to Ade Surya Sukma & Sunaryati (2022), *Non-Performing Loans* (NPL) are ratios that compare the number of non-performing loans with the total loans disbursed. Credit disbursement is always related to credit risk or default risk. The risk of default itself is a situation where there is a possibility that the customer will not be able to return the loan funds along with interest within the agreed period. According to Bank Indonesia's provisions, the ideal limit of NPLs is below 5%. The higher the credit growth, the greater the risk of an increase in NPLs. The relationship between NPLs, credit growth, and MSME financing is positive, where an increase in credit and funding tends to follow the rise in NPL.

According to research conducted previously by Chadwick (2020), macroprudential policies in Turkey effectively reduce the vulnerability of the consumer credit market. This effectiveness is even more evident when macroprudential policy is applied

[4] https://www.consumerfinance.gov/ask-cfpb/what-is-a-debt-to-income-ratio-en-1791/

simultaneously with monetary policy. While other studies have also pointed out that the relaxation of the reserve requirement policy by Bank Indonesia has the potential to stimulate credit growth in the commercial banking sector during the pandemic. However, such a policy may not be sustainable in the long run as Indonesia's economic conditions begin to recover (Aslamah & Pratama, 2021). Meanwhile, according to Badara's (2018) research, macroprudential policy is effective in reducing credit growth, which has the potential to be procyclical. However, the effectiveness of macroprudential policies is limited. *Loan-to-Value* (LTV) policies can only minimize credit growth, but are ineffective in mitigating procyclical traits. LTV policy has effectively mitigated housing price cycles over the long term. However, it shows a limited impact in the short run. In the short term, housing prices tend to be more influenced by broader macroeconomic conditions. Moreover, the introduction of LTV regulations has increased the persistence of housing prices, indicating a shift in market expectations and the structural behavior of housing price dynamics (Lim & Nugraheni, 2017). Different results were found when implementing the countercyclical capital buffer (CCB) and reserve requirement + LDR instruments, which can mitigate procyclical loans. Controlling credit growth through macroprudential and monetary policies is only effective for a combination of LTV instruments and central bank interest rates. In other studies, it was concluded that *the capital adequacy ratio* had an adverse effect on credit risk, the loan-to-*deposit ratio variable* had a significant positive impact on credit risk, and there was a positive influence, indicating that the increase in the *loan-to-deposit ratio* rate owned by banks will increase the condition of banking credit risk. Macroprudential instruments of the minimum mandatory current account have a significant negative influence on bank credit risk; the relationship with the negative direction indicates that the decrease in the compulsory minimum current account will increase the bank credit risk (Zainuri & Arthasari, 2021).

Meanwhile, Nakatani (2020) explained that macroprudential policy has effectively prevented banking crises by controlling credit growth. The LTV ratio is significantly related to the lower likelihood of a banking crisis, and vice versa, through the line of credit. These findings align with macroprudential policy objectives, which are to dampen the credit surge and maintain the banking system's stability. In addition, the relationship between NPLs and credit disbursement is negative. This means that when a bank's NPL ratio increases, the amount of loans disbursed actually decreases. This happens because the high NPL ratio reflects an increased risk of default, so banks become more cautious in distributing loans (Rosalina & Nur Lestari, 2019).

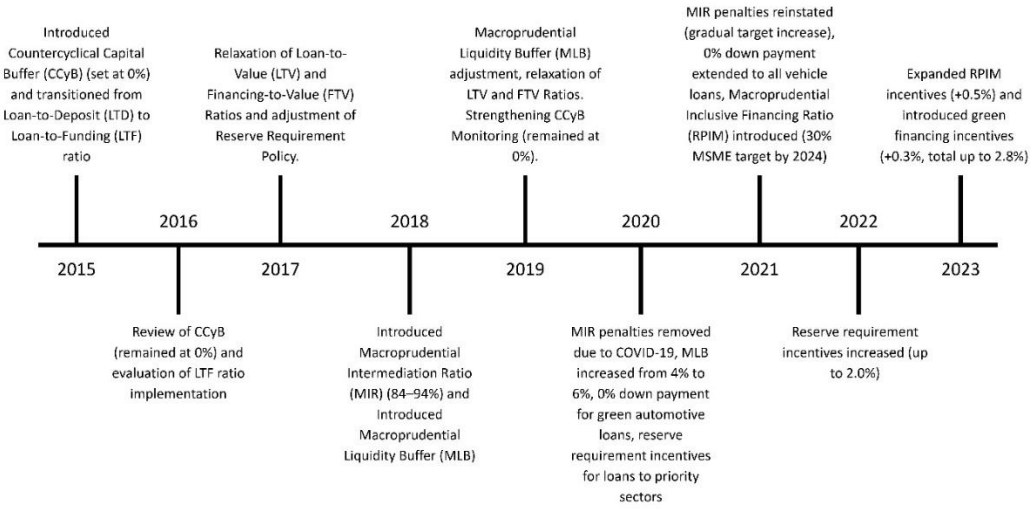

Figure 1 Macroprudential Policy in Indonesia
Sources: Bank Indonesia, OJK, and IMF

Bank Indonesia implemented various macroprudential policies to maintain financial stability and regulate banking credit growth from 2015 to 2023. These policies evolved in response to changing economic conditions, particularly external shocks such as the COVID-19 pandemic in 2020. In the early period, from 2015 to 2017, the focus was on strengthening financial resilience through the introduction of the Countercyclical Capital Buffer (CCyB) and the transition from the Loan-to-Deposit (LTD) ratio to the Loan-to-Funding (LTF) ratio. To encourage credit growth, Bank Indonesia began relaxing Loan-to-Value (LTV) ratios in 2017, reducing down payment requirements for property and vehicle loans. Therefore, between 2018 and 2019, policy adjustments shifted toward more dynamic liquidity regulation with the introduction of the Macroprudential Intermediation Ratio (MIR) and the Macroprudential Liquidity Buffer (MLB). These measures aimed to maintain financial sector stability while ensuring credit growth aligned with economic development. Further LTV relaxation in 2019 signaled an effort to stimulate lending. However, the COVID-19 pandemic in 2020 prompted temporary policy relaxations, including the removal of MIR penalties, the introduction of 100% financing for property loans, and various reserve requirement incentives to support economic recovery.

Furthermore, the Macroprudential Inclusive Financing Ratio (RPIM) was introduced to promote lending to micro, small, and medium enterprises (MSMEs). When the economy began recovering in 2022 and 2023, Bank Indonesia gradually tightened macroprudential policies. Reserve requirements were increased, and incentives for green financing were expanded, encouraging banks to support environmentally sustainable projects. These policy adjustments reflect Indonesia's adaptive approach to macroprudential regulation, balancing financial stability with economic growth by adjusting liquidity regulations, capital requirements, and credit policies in response to domestic and global economic conditions.

Despite these policies, fluctuations in banking credit growth remain a challenge, particularly in response to external shocks such as the COVID-19 pandemic. Referring to studies by Claessens et al. (2014) and Zainuri & Arthasari (2021), the impact of macroprudential policies on credit growth has focused most on short-term effects or specific policy instruments. The previous study examining the combined effects of multiple macroprudential tools—particularly DTI, GWM, CAR, and NPL—on Indonesia's banking sector over a more extended period remains limited**.** Furthermore, existing literature such as Chadwick (2018) predominantly employs time-series models such as Vector Autoregression (VAR), which may not capture the heterogeneity across different banks. In addition, the study by Paolo (2013) is limited by the chosen period and the cross-sectional approach, which may affect the generalizability of the results, especially in capturing long-term dynamics or variations across different economic contexts. Therefore, the novelty of this study is that we used a panel data approach to examine the effectiveness of macroprudential policies on banking credit growth in Indonesia from 2015 to 2023. Considering the interaction between multiple regulatory measures, this study provides a more comprehensive understanding of macroprudential policy effectiveness in managing credit expansion while ensuring financial stability. The findings of this study are expected to contribute to policy discussions by providing empirical evidence on the long-term impact of macroprudential instruments on credit growth. Additionally, this research aims to offer insights for regulators in optimizing policy combinations to mitigate financial risks while supporting sustainable economic growth.

Research Method

The selected research period, from 2015 to 2023, covers several vital phases in the Indonesian economy. These phases include conditions before, during, and after the COVID-19 pandemic that have significantly impacted various aspects of the economy. In 2015, Indonesia experienced several economic instabilities, including a decline in commodity prices, geopolitical tensions, and the influence of global monetary policy. This uncertainty affects the demand and supply of credit, both from the side of banks that are more cautious in providing loans and from the side of debtors who are experiencing economic pressure. This creates a challenging environment for banks to maintain their credit performance. In 2019, Indonesia was still in a stable phase before the pandemic, so this year can be a baseline for macroprudential policy analysis in an everyday context. During this period, Bank Indonesia actively implemented various macroprudential policies, including DTI, minimum mandatory current accounts, CAR, and NPLs to control credit growth and maintain economic stability. This policy is intended to respond to changes in economic dynamics and ensure that the banking sector remains healthy. When the pandemic hit, many emergency policies were issued to deal with economic sluggishness and overcome disruptions in the banking sector. This provides an opportunity to evaluate how macroprudential policy functions in extreme conditions, when the economy faces major shocks and unprecedented challenges. After the pandemic, Indonesia experienced a fairly rapid economic recovery process, as evidenced by the return of credit growth to positive numbers after a drastic decline. Therefore, the period from 2015 to 2023 is crucial to assess the effectiveness of macroprudential policies

in supporting Indonesia's economic recovery and to see its ability to adapt to highly uncertain situations.

This study uses annual data covering 2015 to 2023 to analyze macroprudential instruments that affect banking credit growth in Indonesia. Covering several critical economic events affecting Indonesia's banking sector. This period includes highly dynamic economic conditions, including the impact of the global crisis that occurred in 2015 and the COVID-19 pandemic that hit the world starting in 2020. These events pose significant challenges to the banking system and affect credit patterns in Indonesia, which is the primary focus of this study. The data includes 11 banks divided into four categories: 4 state-owned banks (State-Owned Enterprises) and 7 private banks. The selection of banks in this study aims to cover various banking characteristics, both state-managed and private-sector, to provide a more complete picture of the factors that influence credit decisions. The data used is obtained directly from the annual reports published by each bank.

The data of Bank BUMN was collected from Bank Mandiri, Bank Rakyat Indonesia, Bank Negara Indonesia, and Bank Tabungan Negara. Meanwhile, the data of Indonesia's 7 largest private banks were collected from Bank Central Asia, CIMB Niaga, Danamon, Permata Bank, Maybank, OCBC NISP, and Bank Panin. This study focuses on conventional banks to ensure consistency in analyzing macroprudential effects. Islamic banks were excluded from the analysis due to their distinct operational principles, which differ fundamentally from the interest-based system of conventional banks. In Indonesia, most macroprudential instruments, such as the Loan-to-Value, Countercyclical Capital Buffer, and Reserve Requirements, are primarily designed for conventional banking operations (Beck et al., 2013). Islamic banks, with their different operational principles and product structures, are subject to specific regulatory adjustments, making their inclusion potentially distort the findings (Čihák & Hesse, 2010). The selection of these banks is based on several considerations. First, Bank BUMN is the central pillar of the Indonesian banking system, with a significant market share in credit distribution. Based on the Indonesian Banking Statistics (SPI) report published by the OJK in 2023, the total assets of the four state-owned banks reached more than 50% of the total national banking assets. This makes these banks the central pillar of the role of the public sector in the financial system. Second, these private banks are Indonesia's most prominent private banking institutions in terms of assets and operational networks. These banks have the highest credit volume compared to other banks, so the data produced is considered the most representative for analyzing the general growth of banking credit in Indonesia. Third, state-owned banks often dominate financing for strategic sectors like infrastructure and MSMEs. For example, Bank Rakyat Indonesia (BRI) is a bank focused on funding MSMEs. BRI is known to allocate more than 80% of its credit to MSMEs, making BRI the key in real sector financing.

Meanwhile, private banks such as CIMB Niaga and Bank Permata are more focused on consumer loans, which reflects the dynamics of the needs of urban communities. The combination of these two types of banks covers various aspects of credit needs in Indonesia. In addition, the selection of these banks is also based on complete and

transparent data accessibility. These banks regularly publish financial statements verified by independent auditors, so they can be relied upon to support the analysis conducted in this study.

Table 1 Data and Data Sources

Variable	Data Units	Data Source
Credit Distribution	Billion Rupiah	Annual bank report
DTI	Percent	Annual bank report
Reserve	Percent	Annual bank report
CAR	Percent	Annual bank report
NPL	Percent	Annual bank report

The dependent variable in this study is the bank's credit volume. Credit provided by banks is an essential indicator in banking analysis because it describes the bank's contribution to the economy through funding to the household and business sectors. Thus, credit growth has a significant impact on economic stability and development. Meanwhile, the independent variables analyzed in this study include *Debt-to-Income* (DTI), Minimum Mandatory Current Account (GWM), *Capital Adequacy Ratio* (CAR), and *Non-Performing Loan* (NPL). DTI is a ratio that describes how much the customer's debt burden is compared to their income, which can affect the bank's ability to provide safe credit. Reserve requirement is an obligation that banks must fulfill as a reserve to maintain the stability of the banking system. These three variables were chosen because they are essential indicators in measuring a bank's liquidity, risk management, and financial stability. This study employs a panel data analysis approach to examine the relationship between these variables. This method was chosen because it allows the study to combine *cross-sectional* (from different banks) and *time series* (from different periods). Using panel data, the study was able to identify patterns that might not have been visible if only using time series or cross-sectional data alone. In addition, this method also makes it possible to control the variations between the banks studied and the differences in economic dynamics that occur during the research period.

As previously explained, this study aims to identify the direction and magnitude of the influence of Debt-to-Income (DTI), Reserve Requirement (GWM), Capital Adequacy Ratio (CAR), and Non-Performing Loan (NPL) on banking credit distribution in Indonesia. To achieve this goal, a panel data regression analysis approach is used that allows for a more in-depth analysis by considering the variability of the data both between observation units and times. Panel data regression was chosen because it has the advantage of overcoming problems that may arise due to heterogeneity between observation units, with the formulation of econometric models or estimators as follows:

$$LOAN_{it} = \beta_0 + \beta_1 DTI_{it} + \beta_2 GWM_{it} + \beta_3 CAR_{it} + \beta_3 NPL_{it} + \varepsilon_{it}$$

Information:

LOAN	: Banking credit disbursement (billion rupiah)
DTI	: Debt-to-Income Ratio (%)
Reserve Requirement	: Minimum Dollar Current Account (%)
CAR	: Capital Adequacy Ratio (%)

NPL	: Non Performing Loan (%)
β_0	: Constant
$\beta_1, , \beta_2 \beta_3, \beta_4$	: Regression coefficient of independent variables
i	: the-*i* bank in Indonesia (11 banks)
t	: Year *t*
ε	: *Error term*

To achieve the research objectives, the estimation technique used is the panel data analysis method, which was chosen because it refers to previous studies that also use panel data as an estimation technique, such as Li et al. (2024) and Maichal et al. (2024). Gujarati (2003) describes panel data as a combination of time series and cross-sectional *data*. The data panel was chosen because it could identify the specific characteristics of each individual while also seeing the pattern of data changes in a particular period. The following are the steps in the panel data analysis using *EViews* software.

Basic Model of Panel Data

Following Jintan et al. (2020), this study uses three main approaches in panel data analysis, which consist of:

1. Pooled Least Squares (PLS):

The model assumes that all data is homogeneous, without considering specific differences between banks or time differences. All variables are deemed equal to each individual and time. This model is the most straightforward approach in panel data analysis.

2. Fixed Effects Model (FEM):

This model considers specific effects on each individual (bank), but still assumes that the impact of time is constant. In this model, the differences between individuals are considered to be explainable through dummy variables that represent each entity.

3. Random Effects Model (REM):

The model assumes that variation between individuals is random and does not correlate with independent variables in the model. This approach is suitable when the data comes from a random population sample.

Panel Data Model Selection

To determine the model that best matches the characteristics of the data, three types of model selection tests are conducted (Gujarati, 2003):

1. Chow Test:

The Chow test is used to determine the most suitable estimation model between *the Pooled Least Squares* (PLS) and *the Fixed Effect Model* (FEM). The null hypothesis (H_o) in the Chow Test states that the estimation model used is *Pooled Least Squares* (PLS). In contrast, the alternative hypothesis (H_a) states that the estimation model used is *the Fixed Effect Model* (FEM). H_o is accepted if the probability value (*p-value*) or empirical significance of the statistic F is greater than α; conversely, H_o is rejected if the *p-value* or empirical significance of *the statistic F* is less than or equal to α.

2. Hausman Test:

The Hausman test is used to determine a more precise estimation model between *the Fixed Effects Model* (FEM) and *the Random Effects Model* (REM). The null hypothesis (H_o) in the Hausman Test states that the estimation model used is the *Random Effects Model* (REM). In contrast, the alternative hypothesis (H_a) states that the estimation model used is *the Fixed Effects Model* (FEM). H_o is accepted if the probability value (*p-value*) or empirical significance of the *chi-square* statistic (χ^2) is greater than α; conversely, H_o is rejected if the *p-value* or empirical significance of the statistic χ^2 is less than or equal to α.

Result and Discussion

The estimation of econometric models was conducted using the Pooled Least Squares (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM) methods. The results of the model selection tests that support the analysis are summarized in Table 2. To determine the most suitable estimation model, both the Chow test and the Hausman test were applied among the Pooled Least Squares (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). The Chow test indicated that the Pooled Least Squares (PLS) was the preferred model, while the Hausman test favored the Random Effect Model (REM). As a result, an additional Lagrange Multiplier (LM) test was conducted to identify the best model between the Pooled Least Squares (PLS) and Random Effect Model (REM). This study employs the Random Effect Model (REM), which is preferred over Fixed Effect Model (FEM) models due to its efficiency in handling extensive cross-sectional data without losing degrees of freedom. As explained by Gujarati (2003, p. 647), the inclusion of dummy variables in the Fixed Effect Model (FEM) can significantly reduce degrees of freedom, a limitation overcome by the REM. Moreover, REM assumes that unobserved individual effects are part of the disturbance term, offering a more efficient estimation than the Fixed Effect model, which treats these effects as fixed parameters.

Furthermore, following Gujarati (2003, p. 650), in REM under panel data analysis, the classical assumption tests commonly used in Ordinary Least Squares (OLS) regression, such as tests for heteroskedasticity, autocorrelation, and normality, are not strictly necessary. This is because REM inherently addresses heteroskedasticity and autocorrelation issues through Generalized Least Squares (GLS) estimation, which accounts for individual-specific and idiosyncratic error components. Therefore, this study

focuses on model selection through Chow, Hausman, and LM tests to ensure the appropriateness and robustness of the chosen model.

Table 2 Panel Data Regression Estimation Results

Variable	Regression Coefficient		
	PLS	**FEM**	**REM**
C	20,82252	15,06807	15,10420
LOG_DTI	-1,893899	-0,835163	-0,842138
Reserve	-0,003421	0,003252	0,003220
LOG_CAR	-0,279668	0,190694	0,188066
NPL	-0,059096	-0,009588	-0,009830
R^2	0,168860	0,968852	0,355669
Adjusted, R^2	0,133492	0,963661	0,328250
Stats *F*	4,774422	186,6303	12,97192
Prob. Stats *F*	0,001499	0,000000	0,000000

Model Selection Test

(1) Chow
Cross-Section F (10, 84) = 215.7439; Prob. F (10, 84) = 0.0000

(2) Hausman
Cross-Section random χ2 (4) = 1.5932; Prob. X^2 = 0.8100

Chow Test Results

Based on Table 2, the *p-value* or empirical significance level of the F statistic is 0.0000 (< 0.01). Thus, H_o is rejected, and it is concluded that the appropriate estimation model is *the Fixed Effect Model* (FEM).

Hausman Test Results

Referring to Table 2, the p-value of the χ^2 statistic is 0.8100 (greater than 0.10), leading to the acceptance of H_0. Therefore, the Random Effects Model (REM) is deemed the appropriate estimation model. Both the Chow and Hausman tests indicate that the Random Effects Model (REM) is the optimal model for estimation. The detailed estimation results for the REM are shown in Table 3.

Table 3 Estimated Model Random *Effects Model* (REM)

$$LOAN_{it} = 16.1081 \underset{(0.0000)^{*}}{} - \underset{(0.6959)^{***}}{0,8421DTI_{it}} + \underset{(0.0659)^{**}}{0,0032GWM_{it}} + \underset{(0.2042)^{***}}{0,1881CAR_{it}} - 0,0098NPL_{it}$$

R^2 = 0.3557; *DW* = 0.7466; *F.* = 12.9719; Prob. *F* = 0.0000

Source: Annual Report Bank, processed. **Description:** *Significant at α = 0.01; **Significant at α = 0.05; ***Significant at α = 0.10; The number in parentheses is the probability of the statistical value *t*.

Based on the Random Effects Model (REM) estimation results, the debt-to-income ratio has a negative coefficient (-0.842138), indicating that an increase in DTI leads to a decline in banking credit growth. This suggests that stricter debt-to-income policies may limit banks' ability to extend loans, as borrowers with higher debt burdens face more restrictions in obtaining new credit. Similarly, Non-Performing Loans also exhibit a negative coefficient (-0.009830), implying that a rise in NPLs discourages credit growth. This aligns with the idea that higher levels of bad loans increase financial risks, prompting banks to adopt more cautious lending practices. On the other hand, the Capital Adequacy Ratio shows a positive coefficient (0.188066), suggesting that well-capitalized banks are more confident in expanding credit. A higher CAR enhances financial stability, allowing banks to extend loans without compromising their resilience. Likewise, Reserve Requirement has a small but positive coefficient (0.003220), indicating that a higher reserve requirement does not necessarily restrict credit growth and may contribute to better liquidity management, enabling stable lending practices.

REM Estimated Model Existence Test

A model is considered valid if at least one independent variable exerts a significant effect on the dependent variable, meaning not all regression coefficients are equal to zero. Test F is used to test the existence of the model. Given that four independent variables are in the econometric model analyzed, the hypothesis formulated is as follows: (regression coefficient of all zeros or the model does not exist); (at least one regression coefficient is not the same as zero or the model exists). $H_0: \beta_1 = \beta_2 = \beta_3 = 0$ $H_a: \beta_1 \neq 0 \vee \beta_2 \neq 0 \vee \beta_3 \neq 0 \vee$ H_0 will be accepted if the *value of p* (*p value*), probability, or statistical empirical significance $F > \alpha$.; H_0 will be rejected if the *p* value, probability, or statistical empirical significance *of* $F \leq \alpha$.

Table 3 shows that F's p-value, probability, or statistical empirical significance is 0.0000 (< 0.01); so H_0 is rejected. So it can be concluded that the estimated model, Random *Effects Model* (REM), exists.

Interpretation of the Determination Coefficient (R^2)

The coefficient of determination (R^2) describes how the model can account for variations in dependent variables. Based on Table 3, the R^2 value of 0.3557 shows that the independent variables can explain around 35.57% of the variation that occurs in the credit disbursement variable. This means that this model can provide a sufficient explanation for the level of bank credit distribution. However, there is still an influence from other factors. Meanwhile, the remaining 64.43% of the variation is influenced by different variables or factors not included in this model, which may play a role in determining the distribution of banking loans. It is important to note that while these factors may play a crucial role, their exclusion from the current model does not undermine its validity, as they are either beyond the scope of the study or require additional data not available in the analysis. Further research could incorporate these omitted factors to provide a more comprehensive understanding of the determinants of banking credit distribution. This unexplained variation also highlights the complexity of the banking sector, where multiple

external and internal factors could impact the credit distribution beyond the variables captured in the model.

Test of the Validity of the Influence of Independent Variables *of the REM Estimated Model*

The validity test of influence evaluates the significance of each independent variable's effect individually, using the t-test. In this test, the null hypothesis (H_0) states that $\beta_i = 0$, meaning the independent variable has no significant impact. In contrast, the alternative hypothesis (H_a) suggests that $\beta_i \neq 0$, indicating a significant effect. H_0 is accepted if the p-value, probability, or empirical statistical significance of t is greater than α, and H_0 is rejected if the p-value, probability, or empirical statistical significance of t is less than or equal to α. The results of this validity test are presented in Table 4.

Table 4 Results of the Validity Test of the Influence of Independent Variables

Variable	t	Sig. t	Criterion	Conclusion
DTI	-6,2576	0,0000	< 0.01	Significant at α = 0.01
Reserve	-0,3921	0,6959	> 0.10	Significant at α = 0.10
CAR	1,8610	0,0659	< 0.10	Significant at α = 0.10
NPL	-1,2787	0,2042	> 0.10	Significant at α = 0.10

The results showed that the significant variables of the several independent variables tested were DTI and CAR. In contrast, the GWM and NPL variables were not significant. This indicates that the debt-to-income and capital adequacy ratios are the main factors that directly affect credit growth. The findings of this study suggest that the DTI and CAR are the primary factors directly influencing credit growth in Indonesian banks. Specifically, the DTI reflects the capacity of borrowers to repay loans relative to their income, suggesting that banks prioritize borrowers' debt repayment ability when issuing new credit.

Meanwhile, the CAR indicates the capital buffer that banks maintain to cover potential losses, and a higher CAR is typically associated with more stability in credit issuance, thus positively affecting credit growth. However, the GWM and NPL variables did not significantly affect this model. The lack of significance for the GWM might be explained by several factors, such as a relatively stable macroeconomic environment during the study period, which may have reduced the need for banks to adjust their reserve requirements aggressively. This is consistent with Borio (2003), who argues that, while important, reserve requirements often do not directly impact credit growth when liquidity conditions are stable. Additionally, the NPL variable, which represents the proportion of non-performing loans in a bank's portfolio, could be affected by factors not captured in this model, such as specific loan portfolio management strategies or external economic shocks. This finding also aligns with the European Systemic Risk Board (2019) study, which found that while NPLs affect individual bank stability, they do not always translate into lower credit growth, especially if banks have sufficient capital buffers to absorb losses. This finding aligns with research conducted by Aslamah and Pratama (2021), which suggests that the reserve requirement has a negative and insignificant effect on the growth of commercial bank loans. This could be since GWM is often seen as a regulatory tool, while important, does not always have a direct short-term impact on credit

distribution when banks already operate with sufficient liquidity and are not constrained by liquidity shortages, a point supported by Santos (2001), who highlights the limited effectiveness of reserve requirements in stable economic environments. Several factors might contribute to this study's insignificance of the GWM and NPL variables. These could include differences in the operational characteristics of the banks analyzed, internal policies specific to individual banks that may buffer the influence of these variables, or broader macroeconomic factors such as interest rate policies, inflation, and investor sentiment.

Furthermore, the COVID-19 pandemic, which occurred during a significant portion of the study period, may have disrupted typical banking operations and credit issuance patterns. The pandemic led to policy interventions by the government and central bank, which could have distorted the direct relationship between these variables and credit growth, making their effects less apparent or significant during this period, as suggested by Chen (2023), who found that macroeconomic shocks often interfere with the expected relationships between banking variables and credit growth. Despite these findings, the overall model remains robust in explaining the proportion of variability in credit growth. The significant variables, DTI and CAR, demonstrate that these factors play a crucial role in shaping the credit market in Indonesia. However, the insignificance of certain variables does not diminish the relevance of the model in understanding the broader relationship between banking variables and credit growth. It also indicates that further research may be needed to explore the potential influence of other unobserved factors, such as changes in regulatory enviroment, bank-specific practices, or external shocks like the COVID-19 pandemic, which could further refine the model and its explanatory power, as seen in Claessens, Ghosh, and Mihet (2014), who suggested that the inclusion of macroeconomic and bank-specific factors often makes interpreting the significance of single variables more complex.

Conclusion

The results show that the REM model is the best model for estimating this model. Because the results of the model selection test showed that the FEM model was better than CEM, but the Hausman test showed that REM was better than FEM. In addition, the results of the Lagrange Multiplier Test also confirmed that REM is better than CEM. In the REM model, the DTI variable had a significantly negative impact on credit distribution. In contrast, the CAR variable positively correlated with credit distribution.

Meanwhile, the GWM and NPL variables did not show significant relationships. Overall, based on the R^2 results, the REM model was able to explain around 35.57% of the variation in credit distribution. Nevertheless, other factors not included in this model can affect further credit distribution.

Based on the results of this study, it can be concluded that from several independent variables tested, there are two variables, *Capital Adequacy Ratio* (CAR) and *Debt to Income Ratio* (DTI) which have proven to be significant, this shows that the debt-to-

income ratio and the capital adequacy ratio are the main factors that affect credit growth. Other insignificant variables are likely due to differences in the characteristics of the banks studied, macroeconomic conditions during the study period, or the impact of the COVID-19 pandemic affecting the relationship between the variables. The results of this study are influenced by the limitations of the data used, such as the limited number of samples or a relatively short period. In addition, the selection of variables used in this study may not fully reflect the complexity of factors affecting credit growth. These findings confirm that macroprudential policies regulate credit growth by balancing financial stability and lending capacity. While stricter DTI limits and rising NPLs restrict excessive credit expansion, CAR and GWM provide banks with the necessary resilience to sustain credit distribution. This study highlights the importance of well-calibrated macroprudential policies in maintaining Indonesia's stable yet dynamic banking sector. Therefore, these results can be the basis for further research with a broader scope of data or more complex models. However, the model used remains relevant in explaining the overall data variability, so the results of this study can be the basis for further research to expand the scope of the data and identify other factors that affect credit growth in Indonesia.

Based on the study's results, the DTI variable significantly affects credit distribution, with a negative relationship. The government and banking authorities can consider policies that regulate stricter DTI ratio limits to maintain the banking sector's stability. A high DTI indicates a high debt burden relative to income, which can increase the risk of non-performing loans (NPL). So, it can be concluded that policies that limit the DTI ratio can help prevent an increase in non-performing loans.

In addition, although the NPL and reserve requirement variables were not proven significant in this study, policies encouraging banks to maintain sufficient liquidity, such as strengthening reserve requirements, remain essential to keep the banking sector's stability. Macroprudential policies that pay attention to financial system stability can also be strengthened by considering other factors that affect credit disbursement, such as interest rates and regulations that support bank risk management. Relevant policy sources can be seen from Bank Indonesia's policies related to the DTI and LDR ratios, as stated in Bank Indonesia Regulation No. 14/26/PBI/2012 on *"Minimum Capital Provision Obligations and Fulfillment of Capital Obligations for Commercial Banks".* This policy aims to maintain the stability of Indonesia's banking sector by regulating the banks' credit and liquidity ratios so that they are not at high risk. In addition, the policy of strengthening the reserve requirement regulated by Bank Indonesia can also be optimized to support the sustainability of a healthy financial system (Bank Indonesia, 2012).

References

Ade Surya Sukma, & Sunaryati. (2022). The Effect of Macroprudential Policy on Credit Growth and Financing of MSMEs in Indonesia. *EkBis: Jurnal Ekonomi Dan Bisnis*, *6*(2), 112–128. https://doi.org/10.14421/ekbis.2022.6.2.1695

Ardely, N. P., & Syofyan, S. (2016). Efektivitas Kebijakan Makroprudensial Bank Indonesia. *Journal of Media Ekonomi Universitas Trisakti*, *24*(1). https://doi.org/https://doi.org/10.25105/me.v24i1.3788

Aslamah, A. N., & Pratama, A. (2021). Pengaruh Instrumen Kebijakan Makroprudensial terhadap Pertumbuhan Kredit Bank Umum di Indonesia. *Jurnal Pendidikan Ekonomi, Perkantoran dan Akuntansi*. https://doi.org/10.21009/JPEPA.007.x.x

Bank Indonesia. (2012). *Peraturan Bank Indonesia*.

Bank Indonesia. (2016). *Mengupas Kebijakan Makroprudensial*.

Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking and Finance*, *37*(2), 433–447. https://doi.org/10.1016/j.jbankfin.2012.09.016

Borio, C. (2003). *Towards a macroprudential framework for financial supervision and regulation?* www.bis.org

Ćehajić, A., & Košak, M. (2022). Bank lending and small and medium-sized enterprises' access to finance – Effects of macroprudential policies. *Journal of International Money and Finance*, *124*. https://doi.org/10.1016/j.jimonfin.2022.102612

Chadwick, M. G. (2018). Effectiveness of monetary and macroprudential shocks on consumer credit growth and volatility in Turkey. *Central Bank Review*, *18*(2), 69–83. https://doi.org/10.1016/j.cbrev.2018.03.001

Chen, Y. (2023). The Impact of Macroeconomic Factors on Bank Credit Risk. *Advances in Economics, Management and Political Sciences*, *53*(1), 79–84. https://doi.org/10.54254/2754-1169/53/20230799

Čihák, M., & Hesse, H. (2010). Islamic Banks and Financial Stability: An Empirical Analysis. *Journal of Financial Services Research*, *38*(2), 95–113. https://doi.org/10.1007/s10693-010-0089-0

Claessens, S., Ghosh, S. R., & Mihet, R. (2014). *Macro-Prudential Policies to Mitigate Financial System Vulnerabilities*. Williams College.

Committee on the Global Financial System. (2012). *Committee on the Global Financial System Operationalising the selection and application of macroprudential instruments*. www.bis.org

Dana, B. S. (2018). Evaluation Of Macroprudential Policy On Credit Growth In Indonesia: Credit Registry Data Approach. *ETIKONOMI*, *17*(2), 199–212. https://doi.org/10.15408/etk.v17i2.7324

European Systemic Risk Board. (2019). *Macroprudential Approaches to Non-Performing Loans*.

G-10. (2001). *Report on Consolidation in The Financial Sector*. Organisation for Economic Co-operation and Development.

Gelain, P., Lansing, K. J., & Mendicino, C. (2013). House Prices, Credit Growth, and Excess Volatility: Implications for Monetary and Macroprudential Policy. *International Journal of Central Banking*, *9*(2). https://ssrn.com/abstract=2258465

Gujarati, D. N. (2003). *Basic Econometrics Fourth Edition*. www.mhhe.com

Jintan, A. R., Nahar, F. H., & Azizurrohman, M. (2020). Measuring Inflow of Remittances in Six ASEAN Countries Using Macroeconomic Variables: Panel Data Analysis. *Journal of Economics Research and Social Sciences*, *4*(2), 87–101. https://doi.org/10.18196/jerss.v4i2.10102

Kurniawan, M. L. A., Khasanah, U., & Baharudin, S. 'Aisyah. (2023). Determinant of Property Price Through The Monetary Variables: An ARDL Approach. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, *24*(1), 12–23. https://doi.org/10.23917/jep.v24i1.20588

Li, K., Chen, Z., & Andrikopoulos, A. (2024). Capital inflow liberalization and bank credit risk. *Journal of International Money and Finance*, *142*, 103047. https://doi.org/10.1016/J.JIMONFIN.2024.103047

Lim, C., & Nugraheni, S. (2017). Loan-to-Value Ratio and Housing Price Cycle: Empirical Evidence From Indonesia. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, *18*(2), 225. https://doi.org/10.23917/jep.v18i2.4846

Maichal, M., Hartono, P. G., Firman, A., & Yudha, I. M. E. K. (2024). The Influence of Gross Regional Domestic Product Per Capita and Foreign Direct Investment on Income Inequality: An Empirical Study of 34 Provinces in Indonesia. *Journal of Economics Research and Social Sciences*, *8*(2), 197–206. https://doi.org/10.18196/jerss.v8i2.23256

Matos, T. F. A., Teixeira, J. C. A., & Dutra, T. M. (2024). Macroprudential regulation and bank risk: The role of shareholders' and creditors' rights. *Global Finance Journal*, *59*. https://doi.org/10.1016/j.gfj.2023.100920

Nakatani, R. (2020). Macroprudential policy and the probability of a banking crisis. *Journal of Policy Modeling*, *42*(6), 1169–1186. https://doi.org/10.1016/j.jpolmod.2020.05.007

Pratiwi, S., & Hindasah, L. (2014). Pengaruh Dana Pihak Ketiga, Capital Adequacy Ratio, Return nn Asset, Net Interest Margin dan Non Performing Loan Terhadap Penyaluran Kredit Bank Umum di Indonesia. *Manajemen Bisnis*, *5*(2).

Rosalina, R., & Nur Lestari, M. (2019). *Pengaruh Non Performing Loan (NPL) Terhadap Penyaluran Kredit (Suatu Studi pada PT. Bank Negara Indonesia yang Terdaftar di Bursa Efek Indonesia Periode 2007-2017)* (Vol. 1).

Sabrina Audya, P. (2023). Pengaruh Instrumen Kebijakan Makroprudensial Terhadap Pertumbuhan Kredit Bank Umum di Indonesia. *Parahyangan Economic Development Review (PEDR)*, *2*(2), 92–108.

Santos, J. A. C. (2001). Bank capital regulation in contemporary banking theory: A review of the literature. In *In Financial Markets, Institutions & Instruments* (Vol. 10, Issue 2).

Sugema, I. (2012). Krisis Keuangan Global 2008-2009 dan Implikasinyapada Perekonomian Indonesia. *Jurnal Ilmu Pertanian Indonesia (JIPI), Desember*, *17*(3), 145–152.

Winarso, W., & Mertha Jaya, I. M. L. (2023). Macroprudential Inclusive Policy: Strategies for Banking Sustainability in Indonesia During the Covid-19. *Journal of Economics, Finance and Management Studies*, *06*(05). https://doi.org/10.47191/jefms/v6-i5-24

Zainuri, & Arthasari, T. (2021). Efektifitas kebijakan moneter dan makroprudensial sebagai pengendali risiko kredit perbankan di indonesia. *AKUNTABEL*, *18*(3), 2021–2585. http://journal.feb.unmul.ac.id/index.php/AKUNTABEL