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CAR POLICY, CREDIT RISK, AND ITS IMPACT ON BANKING INDUSTRY RESERVES: ASEAN-5 EVIDENCE

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Abstract

This study aims to examine the effects of Bank Capital to Assets Ratio and Credit Risk to Bank Liquid Reserves to Bank Assets Ratio in ASEAN-5. The study uses panel data, with an annual period of 2010–2020. Panel data regression is employed as the estimation method. Empirical findings show that an increase in bank capital adequacy has a significant impact on reducing bank liquidity reserves. The implications of these findings affirm the importance of achieving an optimal balance in capital and liquidity management as a key prerequisite for achieving banking stability and resilience. Financial authorities in ASEAN must undertake careful and strategic policy design that considers the complex dynamics between capital and liquidity. The need to develop capital adequacy policies that not only focus on credit risk, but also accommodate liquidity needs, is a key aspect in maintaining banking industry stability. The regression results also show positive relationship between credit risk and Bank Liquid Reserves to Bank Assets Ratio (BLR). Therefore, the findings provide policy-relevant insights for financial authorities and banking institutions in ASEAN in developing risk-management and regulatory strategies that consider capital strength, credit risk, and liquidity simultaneously.

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1. Introduction

Macroprudential policy emerged in response to the Asian financial crisis of the late 1990s and has been in the limelight since the global financial crisis in 2008 (Lee et al., 2016). The main objective of macroprudential policy implemented by the International Monetary Fund (IMF) is to maintain the overall stability of the financial system by controlling the increase in systemic risks (Cerutti et al., 2017). Macroprudential policy variables are structured and directed to monitor systemic risks, especially in the financial sector, while preventing the possibility of credit risk arising as a result of excessive credit growth. The main objective of this policy is to prevent shocks that can endanger economic stability (Fernandez-Gallardo, 2023). Furthermore, this policy is not only reactive to existing risks, but also preventive in nature to prevent possible disruptions that could harm overall financial stability. The integration of this strategy has a positive impact not only on the banking industry itself, but also on economic stability in general (Warjiyo & Juhro, 2019).

ASEAN plays a central role as an economic bloc, recording the highest average economic growth among major regional economic blocs in the world during the period (Nasir et al., 2019). The positive and stable rate of economic growth in ASEAN can reflect the welfare of the country in good condition. As a policymaker, ASEAN has a responsibility to ensure that economic growth at the regional level not only has a positive impact locally, but also contributes positively to the global economy more broadly (Zhu et al., 2016). ASEAN's strategic role in the global economy is further strengthened by the implementation of macroprudential policies at the regional level (Capannelli, 2015). This policy is designed to respond to and manage financial risks, including credit risk, carefully and in a coordinated manner (Constâncio et al., 2019). Thus, ASEAN acts as a guardian of economic and financial stability at the regional level, which in turn has a positive impact on global economic dynamics.

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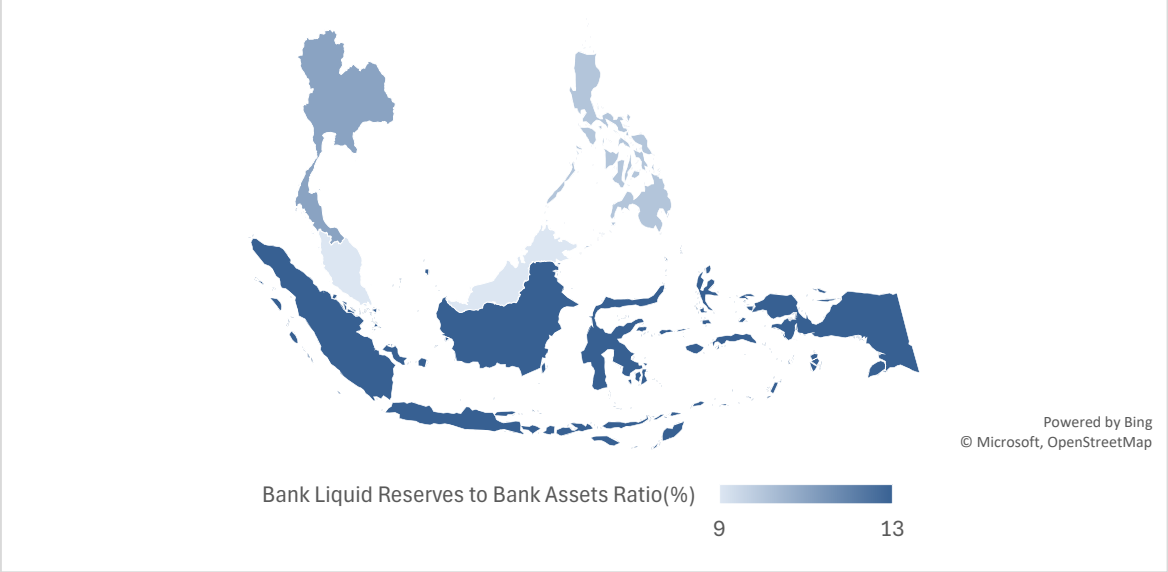


Figure 1. Bank Liquid Reserves to Bank Assets Ratio
Source: International Monetary Fund, 2024

Based on Figure 1, the countries can be ordered from relatively higher to lower ratios as Indonesia, Malaysia, Thailand, Philippines. This variation indicates differences in bank liquidity buffers and liquidity management across the region. BLR is a crucial element in efforts to maintain economic and financial stability in the ASEAN region. This ratio reflects the extent to which banks in ASEAN-5 have sufficient liquid reserves to respond to potential liquidity pressures and meet financial obligations in the short term. In a challenging global context, bank liquidity is the main focus, given the possible impact of rapid and unpredictable economic changes. The Liquid Reserve Ratio can be interpreted as an indicator of the readiness of banks in ASEAN-5 to face possible economic shocks and maintain their smooth operations. The decline in the BLR in ASEAN-5 not only reflects structural changes in liquidity allocation, but can also be attributed to banks' adaptive behavior in the face of various external and internal challenges (Figure 1). Banks may tend to assume greater risks and reduce their liquidity reserves when economic conditions are relatively stable. This can be reflected in more aggressive investment policies to increase returns and optimize profits.

The Capital to Assets Ratio (CAR) plays an important role as a key indicator to monitor systemic risks in the financial sector and can affect banks' liquid reserves (Ghenimi et al., 2017); (Galati & Moessner, 2018). The CAR, which reflects the capital adequacy of banks, is a particularly relevant element in the macroprudential policy framework (Lubis et al., 2019). A high CAR not only indicates the individual financial health of banks, but also contributes to the main objective of macroprudential policy, which is to maintain the overall stability of the financial system. By having sufficient capital buffers, banks can make a positive contribution in controlling increased systemic risks (Skorepa & Seidler, 2015).

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Furthermore, an adequate CAR is also in line with the principles of preventive macroprudential policy, helping to prevent credit risk arising as a result of rapid growth. Thus, the integration of macroprudential policy strategies that pay attention to the CAR level can have a positive impact not only on banking industry stability, but also on overall economic stability, in accordance with the principle of preventing shocks that can harm overall financial stability (Hidayat & Shodrokova, 2025). Higher CAR strengthens banks' capacity to absorb potential losses, which may reduce their need to hold liquid reserves as a precautionary buffer. Therefore, stronger capitalization may lead banks to rely less on liquid assets to manage financial shocks. However, higher CAR may also strengthen liquidity resilience (Abdul-Rahman et al., 2018; Musa et al., 2021). In this study, the former mechanism is expected to dominate, leading to a negative relationship between CAR and BLR.

Conceptually, research in the financial and banking literature has consistently shown that credit risk can have a significant impact on banks' liquidity policies, including BLRs. Research Imbierowicz & Rauch, (2014) points out that when credit risk increases, banks tend to increase their liquidity reserves as a precaution against the potential for greater losses from non-performing loans. Some research, (Chi & Li, 2017; Naili & Lahrichi, 2022; Aris et al., 2025) discusses how credit risk affects banks' liquidity allocation decisions, whether in the form of money market instruments, short-term investments, or cash reserves. In monetary policy studies, if credit risk increases and banks respond with increased liquidity reserves, the monetary regulator may consider these implications in setting interest rates or other liquidity policies. On the other hand, from a macroprudential policy perspective, an increase in credit risk that drives more conservative risk management policies may reflect the importance of regulators in addressing systemic risks and maintaining overall financial sector stability.

By analyzes the effect of CAR and NPL on BLR, this study addresses the limited attention given to the joint role of bank capital and realized credit risk in explaining bank liquid reserve positions. While previous studies have examined capital, credit risk, and liquidity, their combined relationship remains less explored in the ASEAN banking context. The contribution of this study therefore lies not merely in its geographical focus, but in examining CAR and NPL simultaneously as key factors associated with BLR. The ASEAN-5 setting provides a comparative context for examining these relationships across banking systems with different institutional and regulatory characteristics. This approach contributes to a broader understanding of how bank capital to asset and credit risk are associated with bank liquidity and provides relevant implications for bank risk management.

2. Literature Review

The Structure Conduct Performance (SCP) framework provides an additional theoretical foundation for understanding the relationship between bank characteristics and liquidity

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management. The SCP paradigm suggests that market structure influences the conduct of firms, which subsequently affects their performance. In the banking sector, capitalization and credit risk management can be considered important dimensions of bank conduct that influence liquidity decisions and financial stability. A stronger capital position increases banks capacity to absorb losses, whereas higher credit risk may encourage banks to maintain greater liquid reserves as a precaution against potential losses. Thus, the SCP framework supports the argument that differences in bank capitalization and credit risk management may contribute to differences in bank liquid reserves (Bain, 1951).

Rapid developments in the global financial sphere emphasize the importance of a deep understanding of the role of macroprudential policy in managing capital, credit risk and liquidity in the banking industry. Several studies have shown that macroprudential policy has a significant role in: (i) reducing excessive lending rates (Poghosyan, 2020); (ii) stimulating increased domestic savings through the promotion of domestic intermediation; (Körner, 2018); and (iii) providing protection against a potential financial crisis (Bitar, 2021). Therefore, this policy can effectively ensure stability in the financial sector and ensure optimal performance in financial markets (Vučinić, 2016). As a result of credit shocks, countercyclical regulatory policies tend to have a stronger and more effective impact than monetary policy in supporting price, financial and macroeconomic stability. Macroprudential policy aims to reduce how frequent and severe financial crises are, thus eliminating the need for very low interest rates. Countercyclical capital measures seek to lower the neutral real interest rate under normal conditions (Cozzi et al., 2020).

In studies conducted by Abdul-Rahman et al., (2018), CAR was identified as having a significant impact on banking liquidity. This research shows that adequate CAR levels can improve liquidity resilience and reduce short-term liquidity risk. Other research results by Musa et al., (2021) confirmed the findings, showing that the CAR has a positive influence on the liquidity of conventional banks. El-chaarani, (2019), highlights the significant impact of economic growth, asset quality, capitalization ratios, and bank size on liquidity levels in the banking industry. These findings amplify understanding of the factors affecting banking liquidity, covering macroeconomic aspects and internal bank factors.

Previous research has tried to uncover the relationship between credit risk and the ratio of banks' liquid reserves to total assets. This ratio is often referred to as the BLR, which measures how much of a bank's assets are placed in the form of liquid reserves. Research by Ghenimi et al., (2017); Alper et al., (2014); Hugonnier & Morellec, (2017) provides evidence that increased credit risk may lead to an increased need for liquid reserves. They state that banks tend to increase liquid reserves in anticipation of potential losses from riskier credit portfolios. In addition, research by Siddique et al., (2022) Highlights the importance of credit risk management in the context of liquidity. They found that banks that manage credit risk well tend to have healthier liquid reserves, indicating that effective credit risk management can be a determining factor in maintaining adequate levels of liquidity. Twum et al., (2021) investigated the role of macroeconomic variables as mediators in the relationship between

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credit risk and liquidity reserve ratios, highlighting the complexity of external factors that moderate such relationships.

Based on the theoretical and empirical literature, bank capital is expected to influence banks' liquid reserves. Higher capital provides greater loss-absorption capacity, which may reduce banks' precautionary demand for liquid assets. Therefore, a negative relationship between bank capital and bank liquid reserves is expected.

H1: Bank capital-to-assets ratio (CAR) has a negative and significant effect on bank liquid reserves (BLR).

Credit risk is also expected to influence bank liquidity decisions. Higher credit risk may increase the need for liquid reserves as a precaution against potential losses associated with non-performing loans. Thus, a positive relationship between credit risk and bank liquid reserves is expected.

H2: Credit risk (NPL) has a positive and significant effect on bank liquid reserves (BLR).

3. Research Methods

This study employs a quantitative approach using secondary data collected from IMF and World Bank. The sample consists of five ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, and the Philippines. The study uses annual panel data covering the period 2010–2020. The main variables used include bank liquid reserves to bank assets ratio, bank capital to assets ratio, as well as non-performing loans. The data were obtained from publications of the World Bank, International Monetary Fund, as well as literature research on various literature related to the research subject. Table 1 shows the operational definitions of variables used.

This study used panel data regression with three approaches used to estimate the estimation model: Common, Fixed, and Random Effect Model. However, the model selection test uses the Chow, Hausman, and Lagrange multiplier tests to select the best approach to estimating the model.

$$BLR_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \varepsilon_{it} \quad (1)$$

Information:

BLR is Bank Liquid Reserves to Bank Assets Ratio; CAR is Bank Capital to Assets Ratio; NPL is Non-Performing Loan as proxy credit risk and e is error term.

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Table 1. Variable Operational Definition

Variable	Definition	Unit	Data Source
Bank liquid reserves to bank assets ratio (BLR)	The ratio of a bank's liquid reserves to bank assets is the ratio of domestic currency holdings and deposits in monetary authorities to claims to other governments, non-financial public companies, the private sector, and other banking institutions.	%	IMF
Bank capital to assets ratio (CAR)	A financial ratio that measures the proportion of a bank's capital to its total assets. This ratio provides an idea of the extent to which the bank has sufficient capital to cover the risks that may arise from its operational activities.	%	World Bank
Credit Risk (NPL)	Non-performing Loans (NPLs) are the leading indicators used to proxy Credit Risk. NPLs are often measured as a percentage of a financial institution's total credit portfolio. If a large number of loans do not pay on time or experience payment problems, this can affect the financial health of the institution.	%	World Bank

Source: Author compilation, (2024)

4. Results

4.1. Variable Movement Analysis

4.1.1. Analysis of Bank liquid reserves to bank assets ratio Movement in ASEAN-5

The bank liquid reserves to bank assets ratio shows different liquidity management patterns across the five countries. Indonesia shows a general decline in the ratio, suggesting that banks increasingly utilized their assets for lending and other productive activities. This development can support financial intermediation, although a lower liquidity buffer may increase exposure to liquidity pressures. Malaysia presents the clearest downward trend, which may reflect greater asset utilization for credit activities. However, maintaining sufficient liquidity remains important to prevent potential funding risks (Monetary Authority of Singapore, 2011)..

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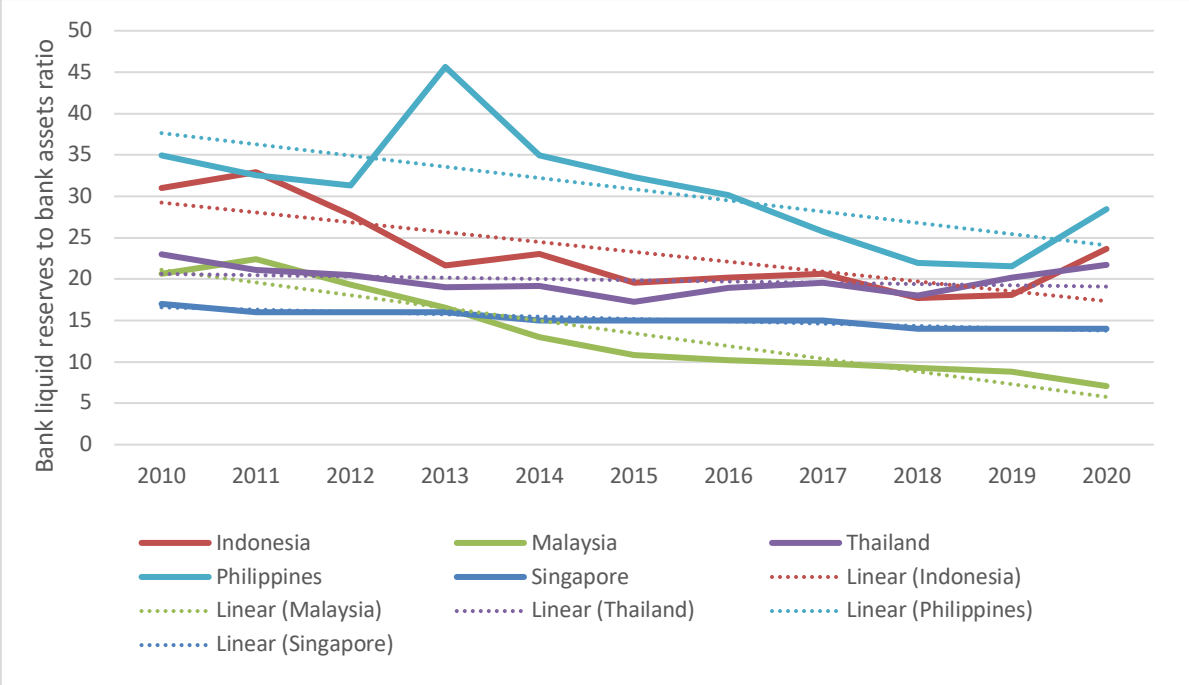


Figure 2. Bank Liquid Reserves To Bank Assets Ratio
Source: World Bank, (2024)

Thailand shows relatively stable movements, indicating consistent liquidity management within the banking sector. This stability may be supported by prudential banking policies aimed at maintaining adequate liquidity and financial resilience (Bangkok Bank, 2021). Singapore also maintains a relatively stable and lower ratio, reflecting efficient liquidity management within its well-developed financial system. Nevertheless, a relatively low level of liquid reserves requires effective supervision and access to reliable funding sources to manage potential liquidity shocks. (Hidayat & Shodrokova, 2024). Meanwhile, the Philippines records the highest ratio and the strongest fluctuations. The relatively high level of liquid reserves may indicate a more cautious approach to liquidity management, particularly in responding to potential funding pressures. However, maintaining excessive liquidity may also reduce the funds available for productive lending. Overall, the difference across countries indicates a trade-off between maintaining sufficient liquidity buffers and supporting financial intermediation.

4.1.2. Analysis of Bank Capital to Assets Ratio Movement in ASEAN-5

Countries such as the Philippines, Malaysia, and Singapore show a relatively stable and low CAR level compared with Indonesia and Thailand. The CAR levels observed in these countries reflect different approaches to managing banking capital and financial risk. The stability of CAR policy in the Philippines, Malaysia and Singapore reflects a more moderate policy strategy, in which capital requirements are applied in such a way that does not impose

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a heavy burden on the balance of the banking industry and overall economic activity. This can be due to considerations to provide greater flexibility for banks in providing credit and supporting economic growth (Lee et al., 2016). The low levels of CAR in these countries also reflect the belief that financial risks can be mitigated by other financial policies and instruments, without the need to implement high capital requirements (Mendoza, 2009). In addition, tighter regulation and supervision of financial institutions in Singapore may also be factors to improve financial stability in the country. Commercial banks in Singapore are required to maintain a minimum risk-weighted capital of 12.5%, or 2% above the Basel III requirement of 10.5% (Monetary Authority of Singapore, 2011

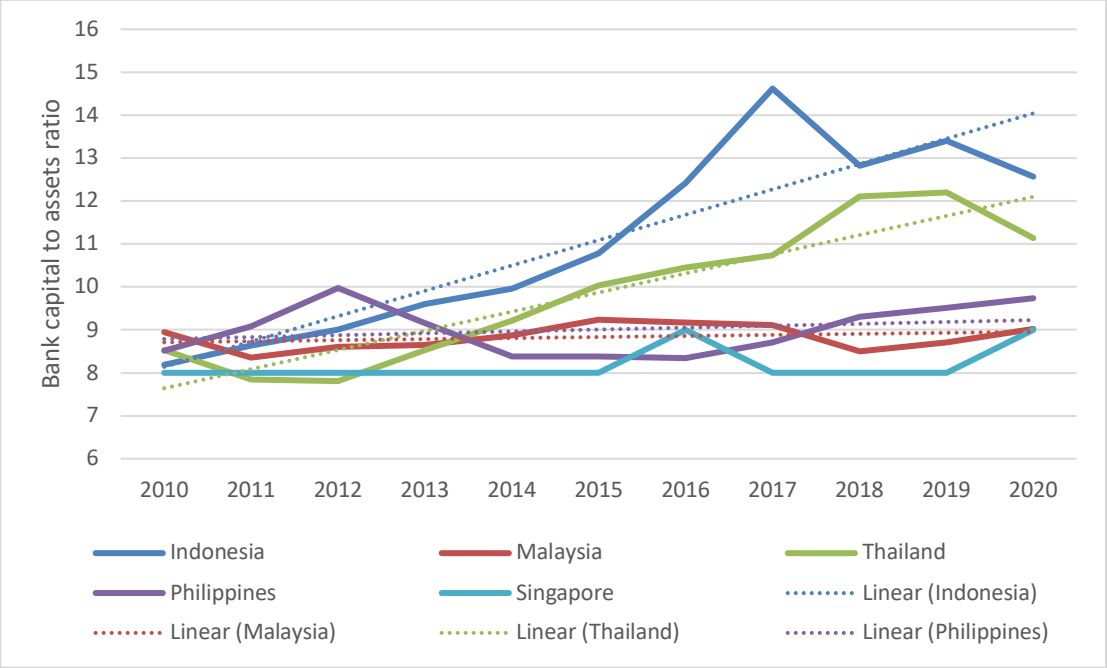


Figure 3. Bank Capital to Assets Ratio
Source: World Bank, 2024

Indonesia and Thailand apply a high Bank Capital to Assets Ratio with a significant upward trend. Indonesia and Thailand implement a high CAR policy with the main objective of increasing banking industry stability and protecting the economy from potential financial risks (Hidayat & Shodrokova, 2024). The high implementation of CAR is in line with the basic principles of managing banking risk and maintaining the integrity of the national financial system. Some policies in both countries include provisions that set a minimum limit on the percentage of bank capital to total assets. The aim is to ensure that banks have sufficient capital reserves to bear the risks that may arise from their operations, especially credit risk and other risks that may affect liquidity and solvency. In Indonesia, banks must prepare core capital (Tier 1) of at least 6% of ATMRs and common equity tier 1 of at least

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4.5% of ATMRs, either individually or in consolidation with subsidiaries (Otoritas Jasa Keuangan, 2016). Under the principles of Basel III, the Bank of Thailand (BOT) requires that commercial banks registered in Thailand and their groups must maintain three minimum capital adequacy ratios: a Common Equity Tier 1 capital adequacy ratio of not less than 4.50 percent, a Tier 1 capital adequacy ratio of not less than 6.00 percent, and a Total capital adequacy ratio of not less than 8.50 percent (Bangkok Bank, 2021).

4.1.3. Analysis of Credit Risk Movement in ASEAN-5 Countries

In Indonesia, credit risk has attracted considerable attention over the past decade, credit risk in the ASEAN-5 banking industry, involving Indonesia, Malaysia, Singapore, Thailand, and the Philippines, has become a phenomenon that has significantly attracted attention. They provide a large and attractive market for global investors (Rashid et al., 2017). Singapore, as a regional financial center, is becoming a magnet for investment and international business activities (Austin, 2015). In the credit risk analysis, the main indicator used is the NPL ratio (Sharifi et al., 2019). Figure 3 shows clearly that average credit risk, measured through NPLs, in ASEAN-5 shows a consistent upward trend. This phenomenon indicates the challenges and dynamics that need to be considered in managing credit risk in the region's banking industry. The upward trend in credit risk can provide a deep understanding of the factors affecting banking industry stability in ASEAN-5, and provide a foundation for formulating responsive and effective policies to face these challenges (Hakim et al., 2023).

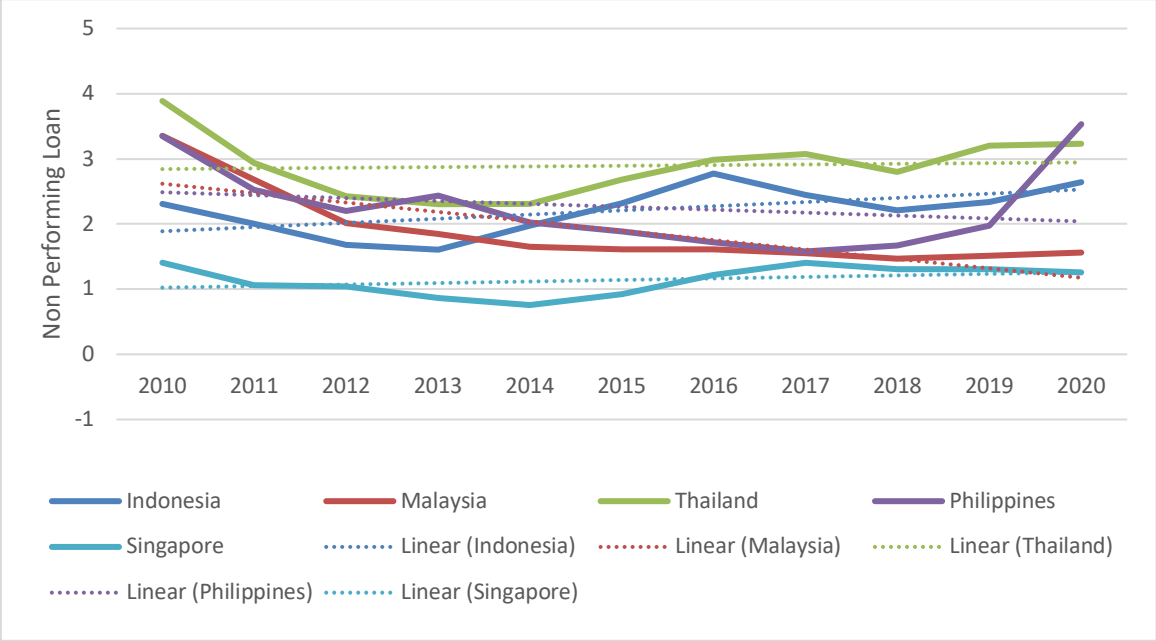


Figure 4. Credit Risk
Source: World Bank (2010-2020)

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In Thailand, Indonesia, and Singapore, there is an upward trend in Non-Performing Loans (NPLs). In Thailand, fluctuations in economic growth that occur can trigger an increase in NPLs, especially in sectors exposed to high business risks, such as tourism or exports. Geopolitical uncertainty and changes in global economic policy may put additional pressure on the banking industry, resulting in increased credit risk (Aris et al., 2025). Meanwhile, in Indonesia, the banking industry's exposure to certain business risks, such as agriculture or manufacturing, can play an important role in increasing NPLs. Internal factors such as slowing economic growth and changes in customers' credit risk profiles may also contribute to increased credit risk in Indonesia (Hidayat et al., 2024). In Singapore, as a regional financial center, increased credit risk can be reflected in the banking industry's exposure to global uncertainty, especially in an unstable geopolitical situation. In addition, changes in business activity and global economic conditions may also have an impact on the quality of banking assets in Singapore.

Meanwhile, the Philippines and Malaysia showed a downward trend in credit risk. The adoption of massive liquidity injections, continuous monitoring of NPLs, implementation of macro-prudential and micro-prudential policies, and dynamic analysis of macro and micro NPL factors are the main factors (Hajja, 2022). Malaysia has a history of stable macroeconomic policies, with a focus on sustainable economic development and financial risk management. Meanwhile, the Philippines also showed a downward trend in credit risk, attributable to economic stimulus policies and measures taken by the government. The Philippines has implemented a policy strategy focused on improved banking risk management and tighter financial supervision (Villacin, 2017). Economic stimulus measures can also help reduce credit risk by boosting economic growth and people's purchasing power.

4.2. Descriptive Statistics

In the analysis of financial data (Table 2) in ASEAN-5, the focus on CAR showed an average value of 9.422291. The highest was recorded in Malaysia in 2017 with a value of 14.62, while the lowest value was in Singapore in 2014 with a value of 7.89. The CAR trend shows year-on-year fluctuations, with a peak in 2017 and a significant decline in 2018 in all countries except Singapore which experienced a decline in 2016.

Table 2. Description of Statistics

	BLR	CAR	NPL
Mean	20.52956	9.422291	2.080010
Median	19.56550	8.947810	2.006681
Maximum	45.63303	14.61830	3.887858

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Minimum	7.071183	7.806757	0.756533
Std. Dev.	7.662225	1.553304	0.743911
Skewness	0.841900	1.563159	0.357970
Kurtosis	3.852603	4.762892	2.406713
Jarque-Bera	8.163184	29.52046	1.981283
Probability	0.016881	0.000000	0.371338

Normality Test

Jarque Bera	1.7976	Probability	0.4071

Residual Cross-Section Dependence Test

Test	**Statistic**	**Prob**
Breusch-Pagan LM	1.658313	0.9483
Pesaran scaled LM	-1.253337	0.2101
Bias-corrected scaled LM	-1.407183	0.1594
Pesaran CD	0.423578	0.6719

Correlation Test

	BLR	**CAR**	**NPL**
BLR	1	0.0159	0.3083
CAR	0.0159	1	0.2570
NPL	0.3083	0.2570	1

Source: Output Eviews, (2024)

On average, NPL recorded a mean value of 2.080010, indicating a relatively moderate level of credit risk among the sample banks. CAR recorded a mean of 9.422291, reflecting a relatively stable level of capital adequacy across the sample. Meanwhile, BLR recorded a mean of 20.52956, indicating the average proportion of liquid reserves held by banks relative to their total assets. The median values provide further insight into the distribution of the data. The median NPL of 2.006681 is close to its mean, while the median CAR of 8.947810 and median BLR of 19.56550 show relatively larger differences from their respective mean

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values. These differences are consistent with the higher skewness values observed for CAR (1.563) and BLR (0.842), indicating greater asymmetry in their distributions.

Several classical assumption tests were conducted to validate the panel regression model. The results indicate that the model is free from normality, cross-sectional dependence, and multicollinearity issues (Jarque-Bera p = 0.407; Breusch-Pagan LM, Pesaran LM, and Pesaran CD tests all p > 0.05; CAR–NPL correlation = 0.257). Heteroskedasticity was detected (LR = 39.372, p = 0.000) but was corrected through re-estimation using the Panel EGLS method with cross-section weights, ensuring the reliability of the regression estimates.

4.3. Econometric Analysis

This study employs panel data regression using three approaches: common effect, fixed effect, and random effect. The selection of the best estimation method is carried out through model selection tests, namely the Chow Test, Hausman Test and LM Test. From Table 3, the results of the Chow Test Prob values are 0.0000 < 0.05, then the FEM model is selected. The Chow test is conducted to compare or choose which is the best between the Common or Fixed Effect Model. Based on the Chow test, the selected model is the FEM. Then continued with the Hausman Test with a Prob value of 0.000 < 0.05, then the FEM was selected.

Table 3. Fixed Effect Model Estimation Results

Variable	Coefficient	t-statistics	Probability
C	28.73026	6.950607	0.0000***
CAR	-1.892765	-4.408551	0.0001***
NPL	4.631461	4.202440	0.0001***
R-squared			0.79617
Prob(F-statistic)			0.0000***
Chow Test			0.0000***
Hausman Test			0.0000***
Country	**Cross Section Effect**		
INDONESIA			5.316330
MALAYSIA			-7.353968
THAILAND			-3.593116

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PHILIPPINES	8.690765
SINGAPORE	-3.060011

Source: Output Eviews, 2024

Note *, **, and *** Indication of significance levels at the 10%, 5% and 1% levels

$$\widehat{BLR} = 28.730 - 1.893CAR + 4.631NPL + \varepsilon \quad (2)$$

Based on Table 3, the CAR variable shows a negative and significant influence, the NPL variable shows a positive and significant influence with a significance level of 99 percent, or below alpha 1 percent. Indonesia showed significant positive influence (5.3163), reflecting unique factors in economic policy or banking regulation. Malaysia and Thailand had large negative cross section effects (-7.3539 and -3.5931 respectively), characterizing specific impacts that could be related to political conditions, changes in the business environment, or the country's economic policies. The Philippines stands out with a high positive cross section effect (8.690765), indicating a significant influence that may be related to domestic economic dynamics. Singapore has a negative cross-sector effect (-3.0600), exhibiting unique characteristics in the banking system or economic conditions that are not covered by independent variables.

4.4. Discussion

4.4.1. The relationship of Bank Capital to Assets Ratio (CAR) to Bank liquid Reserves to Bank Assets Ratio

Based on the findings of the regression results, it can be concluded that CAR has a negative and significant effect on BLR. These findings are consistent with economic theories and banking risk management that emphasize the role of capital adequacy in bank liquidity management. More scientifically, it can be interpreted that the CAR variable has the opposite effect to the BLR variable, where an increase in CAR is associated with a decrease in BLR. Further interpretation refers to the financial and economic literature of banking. A bank's capital adequacy, as measured by CAR, can be considered as an indicator of a bank's financial health and resilience in the face of risks that may arise (Baldwin et al., 2019). In the context of liquidity, the decline in BLR can be seen as a positive response to higher levels of capital adequacy. Banks with adequate capital tend to be more confident to reduce liquidity reserves because they have greater protection against possible liquidity crises. From the SCP perspective, a stronger capital position represents an important aspect of bank conduct in managing financial risk. Higher capitalization strengthens banks capacity to absorb losses thereby reducing their precautionary demand for liquid assets. Consequently, changes in banks capitalization practices can influence their liquidity management decisions and ultimately affect banking performance and resilience (Khan & Kutan, 2021). These findings are in line with previous research by (Ghenimi et al., 2017) which emphasizes the importance

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of the relationship between capital adequacy and liquidity management in the banking industry.

In Indonesia, the increase in CAR that affects the decrease in BLR is in line with the policies of regulators and economic authorities that encourage banks to maintain adequate capital levels to reduce risk. The policy includes strict capital adequacy rules and incentives for banks to raise capital to ensure financial stability and protect liquidity amid economic dynamics. Meanwhile, in other countries, such as Malaysia or Thailand, similar findings may reflect responses to economic conditions and macroprudential policies. The increase in CAR can be directed by policies that encourage banking industry consolidation or enhanced economic resilience to deal with global risks. The Philippines or Singapore, with different economic contexts, implement policies that promote liquidity resilience in line with increased capital adequacy. Increasing CAR can be a prudential strategy to anticipate liquidity risks and maintain banking industry resilience. The movement of data trends showing an increase in Bank Capital to Assets Ratio in all countries and a decrease in Bank Liquid Reserves to Bank Assets Ratio is in line with the global focus on capital adequacy in response to the global financial crisis. This is reflected in the policy direction of global regulators, such as Basel III, which emphasizes increasing capital adequacy to improve the stability of the banking industry as a whole (Rubio & Carrasco-Gallego, 2016).

4.4.2. Relationship of Credit Risk to Banking Credit Risk Bank Liquid Reserves to Bank Assets Ratio

The results of regression analysis show that credit risk has a positive effect on Bank liquid reserves to bank assets ratio (BLR). Based on the results of regression analysis, the findings show a significant positive influence between credit risk and BLR. This result indicates that an increase in the level of credit risk in a bank's portfolio is associated with an increase in the Bank Liquid Reserves to Bank Assets Ratio. Banks that experience increased credit risk tend to increase their liquidity reserves relative to total assets. This interpretation is in line with the concept of banking risk management, where an increase in credit risk can be considered as a signal to pay more attention to liquidity needs as a preventive measure against potential losses due to non-performing loans (Zamore et al., 2018). From the SCP perspective, higher credit risk reflects changes in banks conduct in managing their lending activities and risk exposure. In response to increased credit risk, banks may adjust their liquidity management practices by increasing liquid reserves, which ultimately affects their financial performance and resilience. Thus, the positive relationship between credit risk and BLR indicates that banks respond to greater risk exposure through more precautionary liquidity management (Khan & Kutan, 2021). In the banking economic and financial literature, the positive relationship between credit risk and liquidity reserves can be attributed to banks' strategies in managing liquidity risk arising from high credit risk. Banks that are proactive in anticipating possible increases in credit risk may increase their liquidity reserves to mitigate the impact. These results are supported by the findings of (Naili & Lahrichi, 2022); (Lassoued, 2018).

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In Indonesia, increased credit risk can be a response to a more proactive banking strategy in dealing with potential non-performing loans (Soetanto & Milne, 2020). Policies of regulators or economic authorities that encourage banks to increase credit risk may reflect efforts to maintain financial sector stability through stimulus policies. Credit risk management policies in Malaysia have been instrumental in mitigating potential economic losses that may arise due to the counterparties' failure to fulfil their contractual obligations. Credit risk is recognized as the dominant risk in the banking industry by the Basel Committee. This risk is closely related to the core activities of banking, namely lending and deposit activities. Several factors that can be the cause of banking failure, such as problematic loans, lack of banking skills, lack of regulation, deposit insurance, poor management, and acts of corruption, have been identified in previous literature (Abdul et al., 2015). Macroprudential policies that support economic growth and credit can stimulate banks to increase liquidity reserves as a mitigation measure. Financial institutions in Thailand face significant potential economic risks due to high levels of debt in the private sector in the economy, particularly given the country's low-income levels and limited debt servicing capacity. Thailand's economic recovery has been slower than that of its neighbors (Chhabria, 2022). The Philippines, with differing economic characteristics, implemented policies that promote liquidity resilience in line with increased credit risk. Increasing liquidity reserves can be a proactive strategy to anticipate liquidity risks that may arise due to non-performing loans. Singapore's approach to credit risk management involves the gradual implementation of regulatory measures, compliance with international standards such as Basel III, and continuous evaluation of the macroeconomic environment (Hsieh & Lee, 2020).

5. Conclusion and Suggestion

Empirical findings show that an increase in bank capital adequacy has a significant impact on reducing bank liquidity reserves. The implications of these findings affirm the importance of achieving an optimal balance in capital and liquidity management as a key prerequisite for achieving banking industry stability and resilience in the ASEAN-5 region. More specifically, the policy implications for ASEAN-5 countries are substantial. Financial authorities in Indonesia, Malaysia, Thailand, the Philippines, and Singapore must undertake careful and strategic policy design that takes into account the complex dynamics between capital and liquidity. The need to develop capital adequacy policies that not only focus on credit risk, but also accommodate liquidity needs, is a key aspect in maintaining banking industry stability. The regression results also show a positive correlation between credit risk and Bank Liquid Reserves to Bank Asset Ratio (BLR). Therefore, considering and managing credit risk is crucial in formulating optimal risk and liquidity management strategies within the ASEAN-5 banking industry. Strengthening regulations and incentives that support effective risk management practices will be essential for maintaining the stability and sustainability of the banking industry in the region.

In the face of an increasing trend in credit risk ratios, Thailand is faced with the need for more careful macroprudential policy considerations. Such efforts aim to effectively manage credit risk and strengthen capital adequacy in the banking industry. Macroprudential policy

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adjustments could include stricter measures against high-risk lending practices and increased capital requirements to ensure optimal resilience. Meanwhile, Indonesia can reflect measures on credit risk monitoring, increased transparency, and interagency cooperation as part of its strategy to manage emerging credit risk. Improving the effectiveness of credit risk monitoring systems can help identify potential risks early, while transparency and cooperation between agencies can improve responses to changing economic and banking conditions. Singapore, as a financial hub, has a special need to ensure the resilience of its banking industry. Therefore, policy measures need to be focused on supporting proactive and efficient risk management. This could include the development of policies that encourage the adoption of best practices in risk management, as well as improved regulatory frameworks to mitigate credit risk.

In Indonesia and Thailand, where the Bank Capital to Asset Ratio indicates high stability, monetary policy implications may involve maintaining accommodative policy to support sustainable economic growth. Nevertheless, it should be noted that macroprudential policy remains a crucial element to ensure capital conservation and mitigation of potential systemic risks that may arise. In contrast, in the Philippines, Singapore, and Malaysia, where the Bank-Capital to Asset ratio is relatively small and stable, monetary policy recommendations include more flexible measures to stimulate economic growth. However, macroprudential measures are also needed to be strengthened to anticipate risks, such as increased supervision of high-risk lending, as well as the implementation of anti-asset bubble policies to prevent potential asset bubble risks.

This study has several limitations. The analysis is based on two main explanatory variables and limited ASEAN-5 country sample, which may not capture all factors influencing bank liquidity reserves. Future research could incorporate additional bank-specific and macroeconomic variables, expand the country coverage, and employ alternative estimation methods to provide more comprehensive evidence on the determinants of bank liquidity reserves.

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