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The Impact of the Countercyclical Capital Buffer (CCyB) Policy on Banking Profitability in ASEAN: Before and During the COVID-19 Pandemic

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A B S T R A C T

This study investigates the impact of the Countercyclical Capital Buffer (CCyB) policy on banking profitability in ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand, and the Philippines) before and during the COVID-19 pandemic. Using dynamic panel data from 24 banks and applying the First Difference GMM Two-Step method, the study finds that the Loan-to-Deposit Ratio (LDR), Gross Domestic Product (GDP), and the CCyB policy positively influence banking profitability. Meanwhile, Non-Performing Loans (NPL), inflation, interest rates, and the COVID-19 pandemic have a negative impact. The findings highlight the importance of macroprudential policy in maintaining financial stability during economic shocks.

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INTRODUCTION

In the banking sector, financial system stability is a key factor that significantly influences economic growth (Dursun-de Neef et al., 2023). Economic growth in a country serves as a benchmark to assess the progress and development achieved within a specific period. High economic growth typically indicates a thriving economy, leading to increased credit demand and improved credit quality. Conversely, a decline in output results in reduced income for businesses and banks, lower production, and ultimately a decrease in Gross Domestic Product (GDP) (Craig et al., 2006).

The global financial crises of 1997/1998 and 2008 prompted the implementation of macroprudential policies aimed at maintaining monetary and financial stability (Tarigan et al., 2023). These crises highlighted the dynamic interaction and positive feedback loop between the real and financial sectors, where high credit growth in developing countries during economic crises is intended to stimulate growth—commonly referred to as credit procyclicality (Utari et al., 2012; Warjiyo, 2003). Financial stability thus reflects monetary stability and functions as a tool of monetary policy. In response, Bank Indonesia issued Regulation No. 17/22/PBI/2015 concerning the obligation to establish a Countercyclical Capital Buffer (CCyB), effective from January 1, 2016. The Financial Services Authority (OJK) also issued Regulation No. 11/POJK.03/2020 and No. 14/POJK.05/2020, aimed at supporting national welfare as stated in Article 33 of the 1945 Constitution. This policy requires banks to build up additional capital buffers during periods of expansion to contain excessive credit growth and allows for buffer release during contraction phases at least once every six months.

During the early implementation period, when economic recovery and financial intermediation were still fragile, Bank Indonesia maintained the CCyB rate at 0%. Evaluations in May and November 2016 confirmed this decision, based on the absence of signs of excessive credit growth that might trigger systemic risk. While some credit-to-GDP gaps were observed an indicator for CCyB activation credit growth remained sluggish through late 2016.

The reinforcement of bank capital was achieved through multiple approaches: (1) accurate classification of financial instruments into capital categories such as Common Equity Tier 1 (CET1), Additional Tier 1 (AT1), and Tier 2; (2) the establishment of capital buffer requirements, including the Conservation Buffer and capital surcharges for Global and Domestic Systemically Important Banks (G-SIBs and D-SIBs); and (3) the adoption of a mechanism for capital loss absorption at the Point of Non-Viability (PONV).

The link between monetary policy and bank profitability has not been extensively examined in existing literature. Rather, most prior research has concentrated on how business cycle conditions impact bank performance. A key contribution by Demirgüç-Kunt and Huizinga (1999) highlighted that differences in net interest margins and profitability across banks are shaped by a range of elements, including internal bank characteristics, macroeconomic indicators, tax treatment (both explicit and implicit), deposit insurance policies, the structure of the financial system, and the broader legal and institutional environment.

The Countercyclical Capital Buffer (CCyB) is intended to protect the banking system against systemic vulnerabilities that arise from rapid and unsustainable credit expansion (Basel Committee on Banking Supervision [BCBS], 2017). This policy addresses the procyclical behavior of bank lending, where credit expands during boom periods and contracts during downturns (Salaam, 2015). The policy raises two key issues under Basel III regulations: first, the influence of regulatory capital on bank lending activity, which can affect monetary policy and GDP growth (Tarigan & Danarsari, 2023; Stiglitz, 2011).

Phan et al. (2020) explored the key drivers of profitability in publicly traded commercial banks in Vietnam. Their research indicated that profitability was positively impacted by operational efficiency, total loan amounts, the share of retail loans, state ownership, inflation, and economic growth. Conversely, variables like capital size, credit and liquidity risks, bank size, and income diversification were not found to have a statistically meaningful impact. Additionally, the research highlighted the critical role of asset quality, particularly in light of the credit risks associated with aggressive lending practices in the real estate sector. The study also noted that complying with Basel II capital requirements poses greater difficulties for smaller listed banks compared to their larger peers.

This research seeks to explore the link between capital buffers and bank profitability using data from banks within the ASEAN region. The nature of this relationship may differ across time periods and individual banks, largely influenced by how their actual capital ratios compare to their profit-maximizing optimal levels. To account for this variability, the study employs an empirical approach that accommodates significant heterogeneity both across banks and over time.

LITERATURE REVIEW

Bank Profitability

Profitability refers to the ability to generate profit and serves as a measure of how well a system functions based on the profit it produces (Schroth, 2021). Simorangkir (2003) further defines profitability as a percentage-based metric used to assess how effectively a company generates profit at an acceptable level. From both definitions, it can be concluded that profitability is a percentage-based measurement that indicates a company's capacity to earn a profit at an acceptable level. In relation to this, the money supply is believed to increase the adequacy of bank capital, as the circulation of money is one of Bank Indonesia's monetary policy instruments to maintain the stability of the rupiah's value. Due to various institutional limitations, banks often face numerous risks, including credit risk, liquidity risk, operational risk, market risk, and strategic risk.

Money Demand Theory

This theory discusses the demand for money and the factors influencing it, which are crucial for stabilizing the short-term economy (Mankiw, 2003). It explains consumer behavior in purchasing goods and services, emphasizing the inverse relationship between the price of goods and the quantity demanded, assuming ceteris paribus (Tragaker, 2011).

Financial Intermediation Theory

Financial intermediaries act as a bridge between surplus units (savers) and deficit units (borrowers). Financial markets facilitate the transfer of funds from those without investment opportunities to those with excess funds (Mishkin, 2012). The asymmetry of information between borrowers and lenders often causes inefficiencies, known as asymmetric information.

Pecking Order Theory

This theory states that firms prioritize internal financing over external sources. When external financing is necessary, firms prefer debt over equity, starting from the safest to the riskiest forms of debt. The theory posits that no specific target debt-to-equity ratio exists, only a hierarchy of financing sources. Firms typically rely first on retained earnings, then on debt, and lastly on equity for investment financing. According to Calem & Rob (1999), this preference allows firms to maintain an optimal capital ratio and conserve financial slack for future investment opportunities. As a result, highly profitable banks may maintain lower capital ratios since they are able to finance future investments using internal resources. Qayyum and Noreen (2019) examined how capital structure influences the profitability of both Islamic and conventional banks and discovered that, except for variations in bank size, the capital structures of the two types of banks were largely alike.

Hypotheses

- H1: The Countercyclical Capital Buffer (CCyB) policy has a significant negative effect on banking profitability.
- H2: Non-Performing Loans (NPL) have a significant negative effect on banking profitability.
- H3: The Loan-to-Deposit Ratio (LDR) has a significant negative effect on banking profitability.
- H4: Interest rates have a significant positive effect on banking profitability.
- H5: The Capital Adequacy Ratio (CAR) has a significant positive effect on banking profitability.

Conceptual Framework

In line with the formulated hypotheses, the conceptual model guiding this research is presented as follows:

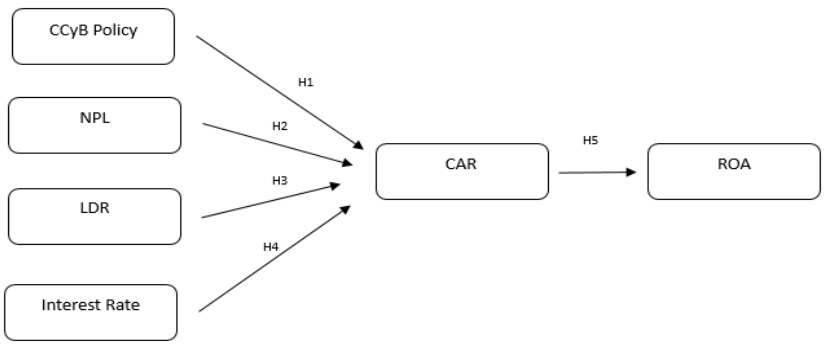

Figure 1. Conceptual Framework

METHODOLOGY

This study utilizes individual bank-level data from publicly listed banks in the ASEAN-5 region (Indonesia, Malaysia, Thailand, Singapore, and the Philippines), along with macroeconomic indicators, over the annual period from 2015 to 2021. A total of 24 banks are included in the sample. The Generalized Method of Moments (GMM) is employed as the primary estimation technique due to its ability to reduce bias and handle potential endogeneity issues effectively. Additionally, the study considers a more robust development of GMM, namely the System-GMM (Sys-GMM), which is suitable when variables may exhibit unit roots and provides more reliable estimates in dynamic panel data settings (Arellano & Bond, 1991). The data analysis is conducted using Microsoft Excel and STATA version 16.

This method aims to examine the impact of the Countercyclical Capital Buffer (CCyB) policy on banking profitability in the ASEAN-5 region. GMM is considered more flexible because it is general in nature and only requires certain assumptions regarding moment conditions—key components derived from the population assumptions of the model (Chaussé, 2010).

The equation formulated to analyze the impact of the CCyB policy on bank profitability, incorporating several updated variables, is as follows:

$$ROA_{it} = \alpha + \beta_1 ROA_{it-1} + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 LDR_{it} + \beta_5 IR_{it} + \beta_6 Covid19_{it} + \beta_7 CCyB_{it} + \beta\gamma_1 INF_{it} + \beta\gamma_2 GDP_{it} + \ldots \quad (2.6)$$

Where:

ROA_{it}	= Return on Assets of country i at time t
ROA_{it-1}	= Lag of Return on Assets
$CAR1_{it}$	= Capital Adequacy Ratio
NPL	= Non-perfoarming Loan
LDR	= Loan Deposit Ratio
IR_{it}	= Interest Rate
Covid19	= Dummy covid-19
CCyB	= Dummy variable for the CCyB
α	= Constant
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$	= Regression coefficients
i	= Bank

This study also explores bank behavior in response to changes in capital regulation such as the implementation of the CCyB. Apart from internal banking factors, credit expansion is also shaped by broader macroeconomic conditions, including GDP and interest rate levels. During times of economic growth, this can lead to credit pro-cyclicality, where lending activity rises in response to improved economic performance.

RESEARCH RESULT
Descriptive Statistics

Table 1. Results of Descriptive Statistics Test

Variable	Ob	Mean	Standar Deviasi	Min	Max
ROA	288	1.77604	1.308552	.05	9.46
CAR	288	15.98743	3.28375	10.7	29.86
NPL	288	2.331095	1.065873	.37	5.8
LDR	288	90.65847	12.065873	55.2	145.9
GDP	288	3.974306	3.394518	-9.5	14.5
Inflation	288	2.393056	1.89952	-1.1	6.4
Interest Rate	288	3.675694	2.869526	-4.5	10
Covid	288	.1666667	.3733267	0	1
CCyB	288	.5833333	.4938648	0	1

The descriptive statistics summarize the number of observations, along with the standard deviation, mean, minimum, and maximum values for each variable included in the analysis. As shown in Table 1, the Return on Assets (ROA) variable has an average of 1.77604 percent, with a standard deviation of 1.308552, a minimum of 0.05 percent, and a maximum of 9.46 percent. The Capital Adequacy Ratio (CAR) averages 15.98743 percent, with a standard deviation of 3.28375, ranging from 10.7 percent to 29.86 percent. The Non-Performing Loan (NPL) ratio shows a mean of 2.331095 percent, a standard deviation of 1.065873, a minimum of 0.37 percent, and a maximum of 5.8 percent. Meanwhile, the average growth rate of Gross Domestic Product (GDP) is 3.974306 percent, with a standard deviation of 3.394518, and it ranges from -9.5 percent to 14.5 percent. Inflation (INF) has an average of 2.393056 percent, a standard deviation of 1.89952, a minimum value of -1.1 percent, and a maximum value of 6.4 percent. The Interest Rate variable shows an average of 3.675694 percent, a standard deviation of 2.869526, a minimum value of -4.5 percent, and a maximum value of 10 percent.

Sargan Test

Table 2. Results of the Sargan Test

Sargan Test	Probability
Prob > chi2	1,0000

The Sargan test is used to examine the validity of instrumental variables when their number exceeds the number of parameters (overidentification). Additionally, it helps determine whether the model satisfies the condition of exogeneity. The expected outcome of this test is a failure to reject the null hypothesis (H_0), indicating that the instruments used are valid (Arellano & Bond, 1991). Based on Table 2, the result of the Sargan specification test shows a p-value

of 1.000 for the ROA variable. Since this value exceeds the 0.05 significance threshold, the null hypothesis is not rejected. This implies that the moment conditions are met, confirming the validity of the instruments applied in the model.

Arellano-Bond Test (AB Test)

Table 3. Arellano-Bond Test Results

AR	Z	Prob > z
1	-1.7643	0.0777
2	.93803	0.3482

The Arellano-Bond test, also known as the AR test, is a specification test used to detect the presence of autocorrelation in the model by observing the z-probability value of AR(2). This test ensures the consistency of the estimators produced by the GMM method. Specifically, the test verifies the absence of second-order serial correlation in the error components. The null hypothesis (H_0) of this test states that there is no second-order serial correlation in the error terms. The expected result is a failure to reject H_0, indicating that the estimators are consistent (Arellano & Bond, 1991). Based on Table 3, the estimation results for AR(2) in the System-GMM model show a p-value of 0.3482 for the ROA variable. This value exceeds the 0.05 significance level, suggesting that H_0 cannot be rejected. Therefore, it can be concluded that there is no second-order autocorrelation, and the model does not suffer from serial correlation, confirming the consistency of the GMM estimators used in this study.

Partial Test

Table 4. First Difference GMM Estimation Results

Variable	Coefficient	Standard Error	P>|z|
ROA	0.5403929	0.00382961	0,000
CAR	-0.0106119	0.0085917	0,217
NPL	-0.1815017	0.0277303	0,000
LDR	0.0108866	0.00235	0.000
GDP	0.0230891	0.0051374	0.000
Inflation	-0.1065679	0.01816666	0.000
Interest Rate	-0.0784349	0.0125459	0.000
Covid	-0.1940404	0.0661853	0.302
CCyB	0.5443861	0.0473437	0.000
_cons	1.195406	0.2326448	0.000

The lag of the endogenous variable ROA is positively significant at the 1% level, with a coefficient of 0.5403929 and a p-value of 0.000 (H_0 is rejected). This indicates the presence of time correlation in the model, meaning that the current period (t) is influenced by the previous period (t-1), confirming the dynamic nature of the model. The Capital Adequacy Ratio (CAR) is not statistically significant, with a coefficient of -0.0106119 and a p-value of 0.217 (H_0 is accepted). This suggests that changes in CAR do not significantly influence ROA.

The Non-Performing Loan (NPL) variable shows a statistically significant negative effect at the 1% level, with a coefficient of -0.1815017 and a p-value of 0.000, indicating that the null hypothesis is rejected. This suggests that a 1% rise in NPL results in a reduction in ROA. Similarly, the Loan-to-Deposit Ratio (LDR) demonstrates a statistically significant positive effect at the 1% level, with a coefficient of 0.0108866 and a p-value of 0.000, meaning the null hypothesis is also rejected. Thus, a 1% increase in LDR corresponds to a rise in ROA.

Gross Domestic Product (GDP) exhibits a statistically significant positive relationship at the 1% level, with a coefficient of 0.0230891 and a p-value of 0.000, leading to the rejection of the null hypothesis. This indicates that a 1% rise in GDP enhances banking profitability, as reflected in ROA. Conversely, inflation shows a significant negative impact at the 1% level, with a coefficient of -0.1065679 and a p-value of 0.000. Therefore, a 1% increase in inflation results in a decline in ROA.

The interest rate variable demonstrates a statistically significant negative effect at the 1% level, with a coefficient of -0.0784349 and a p-value of 0.000, resulting in the rejection of the null hypothesis. This suggests that a 1% increase in interest rates significantly reduces ROA. In contrast, the Covid-19 dummy variable assigned a value of 0 for the pre-pandemic period and 1 during the pandemic shows no statistical significance, with a coefficient of -0.1940404 and a p-value of 0.302, leading to the acceptance of the null hypothesis. This means that the Covid-19 pandemic did not have a statistically meaningful impact on ROA within the context of this model.

The Countercyclical Capital Buffer (CCyB) dummy variable, coded 0 before policy implementation and 1 after, is positively significant at the 1% level, with a coefficient of 0.5443861 and a p-value of 0.000 (H_0 is rejected). This suggests that the implementation of the CCyB policy significantly increased bank profitability (ROA).

Simultaneous Test (F-Test)

Table 5. Results of the Simultaneous Test (Wald Chi-Square Test)

Wald Chi2	**Prob > F**
19842.18	0,0000

The F-test, also known as the simultaneous test, evaluates whether the independent variables, when taken together, significantly influence the dependent variable. This assessment relies on the Wald Chi-Square statistic and involves comparing the resulting p-value (Prob > Chi^2) with a defined

significance threshold. According to the results shown in Table 5, the Wald Chi-Square value is 19842.18, with a p-value of 0.0000. As this p-value falls below the 5% significance level, the null hypothesis (H_0) is rejected. This outcome suggests that at least one of the independent variables exerts a significant joint effect on the dependent variable within the model.

DISCUSSION

The findings of this study reveal that the Countercyclical Capital Buffer (CCyB), represented by a dummy variable, has a significant and negative impact on banking profitability across ASEAN-5 countries. This result diverges from previous research by Andaiyani, which indicated that the CCB policy had no significant effect on the profitability of regional development banks (BPDs), such as BPD Aceh and BPD South Sumatra, where the policy was not fully implemented (Andaiyani, 2021). In contrast, this study, which accounts for profitability fluctuations across banks in Indonesia, Malaysia, Singapore, Thailand, and the Philippines, finds that the activation of the CCB policy contributed meaningfully to a decline in bank profitability. These results provide empirical support for Bank Indonesia's position during the COVID-19 pandemic, when it implemented the CCyB policy without requiring banks to raise their capital above the minimum threshold of 8%. Additionally, the collaboration between Bank Indonesia and the Federal Reserve through the Foreign and International Monetary Authorities (FIMA) Repo Facility launched on March 31, 2020 aimed to stabilize financial systems in emerging markets, further reinforcing the role of macroprudential coordination in maintaining banking stability (Bank Indonesia, 2020).

The study also finds that Non-Performing Loans (NPL) have a significant and negative influence on banking profitability in ASEAN-5. This suggests that increases in NPL ratios are detrimental to financial performance, underscoring the importance of maintaining asset quality as a key determinant of bank profitability and stability (Rismanty et al., 2023; Andaiyani et al., 2021). Meanwhile, the Loan-to-Deposit Ratio (LDR) demonstrates a significant and positive relationship with profitability, indicating that higher efficiency in transforming deposits into productive loans enhances return on assets (ROA). This result aligns with prior studies that emphasize the profitability advantages associated with optimized loan deployment (Rismanty et al., 2023).

Interest rates are found to have a significant and negative impact on bank profitability in ASEAN-5, highlighting the sensitivity of bank earnings to changes in monetary policy. Higher interest rates tend to constrain profitability by increasing funding costs and reducing credit demand. This outcome is consistent with the study by Riaz et al., which showed that central bank interest rates in Kenya directly influenced the financial performance of commercial banks, where higher rates led to lower profitability (Riaz et al., 2013).

Macroeconomic conditions also play an important role in shaping bank profitability. Gross Domestic Product (GDP) has a significant and positive effect, indicating that stronger economic growth fosters a more favorable business environment and increases the utilization of financial services, thereby

improving bank performance. These findings are consistent with those of Addai et al. (2022), Asteriou et al. (2021), Meslier et al. (2014), Ammar & Boughrara (2019), and Hussain Khan et al. (2022). Furthermore, inflation is also found to have a significant and positive impact on profitability, particularly when inflation is moderate and under control. In developing economies, such as those within ASEAN-5, well-managed inflation can contribute to enhanced earnings in the banking sector, as supported by previous research (Addai et al., 2022; Asteriou et al., 2021; Ammar & Boughrara, 2019).

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in the previous chapters, this study concludes that the implementation of the Countercyclical Capital Buffer (CCyB) policy has played a significant role in supporting banking profitability in the ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand, and the Philippines). The findings reveal that the activation of the CCyB policy contributed to economic stability during the COVID-19 pandemic, mitigating potential declines in profitability. This was further supported by internal bank performance indicators such as Non-Performing Loans (NPL) and Loan-to-Deposit Ratio (LDR), which helped maintain financial health and resilience in the banking sector.

Future research is encouraged to expand the scope by incorporating additional variables related to fiscal economics, extending the geographical coverage of the study, exploring other macroprudential policies, and employing different methodological approaches for estimation. These enhancements could offer deeper insights and more comprehensive evaluations of how macroeconomic policies interact with bank profitability across various economic environments.

ADVANCED RESEARCH

Future research can benefit from examining the long-term effects of the Countercyclical Capital Buffer (CCyB) policy beyond the immediate impact observed during the COVID-19 crisis. By incorporating longitudinal data, scholars can better assess the sustainability of CCyB's influence on banking profitability under varying economic cycles. Additionally, analyzing the differential impact of CCyB on banks of different sizes, ownership structures, or risk profiles across the ASEAN-5 could provide more nuanced insights into the policy's effectiveness across institutional contexts.

Moreover, comparative studies involving both ASEAN and non-ASEAN countries could highlight how regional regulatory frameworks influence the success of macroprudential tools like CCyB. Integrating cross-country panel data with advanced econometric techniques—such as dynamic panel models or structural vector autoregressions (SVAR)—may uncover complex interlinkages between macroeconomic variables and banking sector performance. These future directions would contribute to a more global and policy-relevant understanding of how CCyB functions within diverse financial systems.

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