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Policy Interest Rate, Risk Management and Profitability: Study Of Public Listed Banks in ASEAN Countries

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Abstract: The paper aims to explore the impact of low interest rate policy and prudent behavior on the profitability of ASEAN-4 publicly listed banks. The study uses net interest margin as a measure of profitability because it reflects a bank's ability to manage its operations and interest-bearing assets effectively. A panel data regression model is used to analyze data from 79 publicly listed banks in ASEAN-4 countries (Thailand, Indonesia, the Philippines, and Malaysia) from 2005 to 2019. There are three variables for risk management: the capital adequacy ratio (CAD), which measures the prudential approach to risk management; the asymmetric Z-score, an accounting measure of insolvency risk; and the volatility of net interest income. The study also includes two control variables: bank control variables (equity, size, and lending) and Country control variables (real GDP and average inflation). The model employs General Method of Moments (GMM) estimators to mitigate potential endogeneity issues in the panel data regression. The interaction terms of prudential behavior and the interest rates are negative and significant for the Z-score; positive and significant for the volatility of NIM and the capital adequacy ratio. Therefore, the profitability of banks and interest rates are more closely related when banks' risk management policies and practices are better managed.

Keywords: *net interest margin, bank asset management, insolvency risk, ASEAN*

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INTRODUCTION

Fifteen years after the Global Financial Crisis (GFC) in 2008, many Southeast Asian countries were experiencing a slowdown in growth while simultaneously trying to meet inflation targets. Central banks have maintained their low-interest rate policy. This has created a challenging environment for banks in balancing their profitability and risk. Prudent behavior is becoming the tenet of risk management. Studies by Adrian and Shin (2010) show that banks are encouraged to take on more risky ventures to become profitable when interest rates are "too low for too long."

Learning from past crises, both profitability and prudential risk management are key indicators of sound financial stability, as shown in the studies by Hoffmann (2011), Trujillo-Ponce (2012), and Martynova et al. (2021). There is a wide body of literature on credit risk. This study specifically focuses on how the prudential behavior may prevent banks from insolvency risk. Operating in an environment of prolonged low interest rates has created challenges for banks' profitability and increased their volatility. Few empirical studies have focused on this matter in various developed countries (see Genay &

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Podjasek, 2014; Borio et al., 2017; Claessens et al., 2018); however, this study focuses on the Southeast Asia banking system.

An extended period of low interest rates, as shown in Table 1 below, provides banks with better valuations of the securities they hold, lower levels of non-performing loans, and increased lending growth, as low interest rates spur economic growth.

Table 1. Low interest rates in ASEAN-4 Countries between 2009 and 2019

Year	Indonesia	Philippines	Thailand	Malaysia
2009	5.75	5.67	4.57	11.78
2010	-1.75	3.16	0.24	-2.11
2011	4.59	2.64	1.28	-0.4
2012	7.75	3.61	3.22	3.75
2013	6.37	3.63	3.22	4.47
2014	6.79	2.40	3.46	2.07
2015	8.35	6.34	3.98	3.31
2016	9.22	4.31	1.76	2.83
2017	6.50	3.23	2.39	0.80
2018	6.47	2.29	2.64	4.23
2019	8.62	6.28	3.31	4.81

Source: World Bank (2022)

However, in the long run, after considering banks' exposure to various interest rates, maturity profiles, and risk management practices, the benefits of lower interest rates may lead to a lower Net Interest Margin (NIM).

Bank profitability has become a major concern since it affects and determines the resilience of banks and the banking system. Profitability indicates banks' risk management practices. Excessive risk-taking may yield much higher profitability for the bank, while low profitability suggests that banks may not have built adequate capital to absorb unexpected losses. The longer time required to accumulate capital is detrimental to banks' ability to respond to the economic shock, both in terms of mark-to-market losses and default risk in their commercial and retail loan portfolios. The longer banks need to build up their capital, the slower their loan portfolios grow and the slower their ability to support the economy. Banks will find it difficult to raise new capital from the capital market when profitability is weak. Banks with weak profitability show that their historical return on equity (ROE) is below the future cost of equity or the return on capital required by shareholders.

Three independent variables are deployed in this study to measure the prudential approach to risk management in banks. These variables are the capital adequacy ratio (CAR), a symmetric Z-score for measuring insolvency risk, and the volatility of net interest income. The study uses data from publicly listed banks in Indonesia, Malaysia, Thailand, and the Philippines. To mitigate potential endogeneity issues in the panel data regression, the study employs Generalized Method of Moments estimation (Arellano & Bover, 1995). The profitability is measured solely by Net Interest Margin (NIM) in this study. Net Interest Margin is chosen as the profitability measurement because it captures the bank's core performance, isolates it from operational performance, and provides an early warning sign of unmanaged interest rate risks (including changes in policy interest rates) or increasing non-performing assets (NPAs). NIM, normalized by average earning assets, provides a more straightforward comparison of the profitability of banks of vastly different sizes or business models (Amgori et al., 2019; Federal Deposit Insurance Company, 2018).

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The banking systems, models, and development pace in these ASEAN-4 countries are diverse. During the study period, some banks in the region were undergoing consolidation to reduce the number of banks, while others had just completed consolidation and were focusing on tightening bank regulations.

The results of this study show that the low policy rate is positively correlated with the NIM during the period 2005-2019. The results underline the importance of adopting a more prudent risk-taking attitude and implementing better risk management practices, leading to higher profitability, as shown in Table 4, where the positive correlation between interest rates and profitability is reduced.

This paper is organized as follows. Part two shows an overview of the bank's profitability, risk management, and low policy interest rates. The third section describes the data, methodology, variable definitions, and model specification. Part four of this paper presents the results and discussion of the empirical findings, and Part five presents the conclusions.

Demirguc & Huizinga (1997) show that, in developing countries, higher profitability in the banking sector is associated with higher interest rates, driven by wider interest margins. This has been caused by the general practice of having deposit rates below market interest rates. While in the context of developed countries, Albertazzi & Gambacorta (2009) and Bolt et al. (2012) find the positive correlation between net interest income and interest rate through different parts of the yield curve, and another positive correlation between short-term interest rate and loan loss provision of the banks, which reflects prudent behavior in risk management practice. Alessandri & Nelson (2014) find that banks tend to raise their lending rates and tighten lending standards to reduce their lending volume in response to a higher interest rate environment, where default is more likely.

Studies by Genay & Podjasek (2014), Bikker & Vervliet (2017), and Claessens et al. (2018) show that the effect of a persistent low interest rate environment on net interest income has pushed banks to have lower profits and to shift their lending portfolio to investment in securities and non-interest income business. In contrast, a higher interest rate environment has increased loan loss provisions due to a higher probability of borrower default. A study by Saunders and Schumacher (2000) in a multi-country setting suggests that banks have strategic choices for assuring solvency: higher capital-to-asset ratios, increased leverage, or lower loan fees, all of which result in lower net interest margins.

There are several ways declining interest rates could affect bank profitability. First, the change in net interest margins. A refinancing of maturing loans with higher interest rates into new loans at lower rates may be followed by a repricing of bank funding rates, such as deposits and other funding instruments, leading to changes in banks' net interest margins. The dynamics between deposit and loan rates drive the decline in the net interest margin. When deposit rates reach a plateau and loan interest rates fall faster, the net interest margin also falls. Raddatz et al. (2020) show similar findings in the years after the Euro debt crisis between 2013 and 2015. Second, low interest rates can stimulate economic activity, reduce defaults, and cause a decline in loan loss provisions. In a more dynamic economy, lower interest rates reduce the interest burden, increase household income, and improve firms' profitability, thereby reducing the probability of borrower default and enabling banks to lower their expected loan losses and reduce loan-loss provisioning.

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Higher revenue and net interest margin derived from the high credit growth are the results of a stimulated economy caused by low interest rates; an increase in the banks' return on assets would not automatically take place if the banks expand the amount of their consumer and commercial loans and shift their assets from low-yielding investments in government securities and interbank assets. Aside from higher returns on assets, an increase in leverage may spur higher returns on equity by boosting credit growth. In a more dynamic economy, banks could also earn higher non-interest or fee income from activities such as mergers and acquisitions and from better performance of their securities, as declining interest rates would increase asset prices.

The stability of the banking industry lies in the balance between performance and risk management in managing volatility and uncertainty. Several studies in the past have shown a relationship between bank profitability and bank risk, because risk control and the determinants of risk indicators used in risk management practices are based on their impacts on profitability (Boadi et al., 2016; Alshatti & Ali, 2017). Risk-taking behavior in banking is also influenced by a bank's profitability (Camara et al., 2013; Martynova et al., 2021). Studies by Alshatti & Ali (2017), Trad et al. (2017), and Bikker & Vervliet (2017) demonstrate the importance of financial ratios in evaluating credit risk in the banking sector.

Z-score has been used as one of the most important ratios for measuring the insolvency risk. It represents the level of bank capital based on its return on assets distribution and the accounting distance to default, as shown in the studies by Camara et al. (2013), Abdullah (2015), and Boadi et al. (2016). Credit risk has been considered more complex than any other risks; hence, it requires more reliable measurements (Boffey & Robson, 1995). According to Boadi et al. (2016), banks face two distinct risks. First, the funding risk arises from the bank's inability to mobilize more deposits and third-party funds. Second, the insolvency risk. The literature gives limited attention to insolvency risk.

Anh and I (2022) find that there are both direct and indirect associations between bank credit risk, profitability, and financial stability. The study shows that there are similarities between the determinants of bank financial stability and those of bank profitability, such as bank size, prior-period profitability, loan loss provisions, non-interest income, and bank credit growth. These factors are positively correlated with bank profitability and bank financial stability. A study by Abbas et al. (2019) shows that bank profitability is positively correlated with bank capital in large and medium banks, both in advanced Asian countries and the U.S.; however, the way bank profitability influences bank capital differs by bank size. It shows a positive correlation between profitability and bank capital for large banks, but a negative correlation for medium-sized banks.

Insolvency risk involves the inability of banks to meet their obligations to lenders, implying that banks' assets are worth less than their liabilities (Turgut, 2018). In this study, the Z-Score ratio is used as a measure of insolvency risk, with higher Z-Scores indicating healthier, more stable banks. The study by Tan et al. (2017) finds a significant, positive relationship between the Z-score, an indicator of risk, and profitability indicators for the banking industry, as represented by ROA and ROE. Fang et al. (2019) conclude that the positive impact of cost efficiency on profitability is stronger when banks undertake higher risk and face more competition. Their findings also show that bank profitability, as indicated by ROA and NIM, is positively correlated with insolvency risk.

The use of net interest margin (NIM) as a profitability metric has significant implications for business strategy and regulatory policy, particularly when banks rely on non-interest income (NII) and new off-balance-sheet activities as their main revenue

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streams, as supported by regulatory policy. However, a higher share of fee or non-interest income in the bank's revenue indicates greater volatility in its profits and, at the same time, increases the probability of default for financially distressed banks (J. Nguyen et al., 2021). The study by the U.S. Federal Deposit Insurance Corporation (FDIC, 2021) shows that the directional effect of rising short-term market interest rates on NIM is theoretically ambiguous, as *NIM* moves in the opposite direction of the federal funds *rate*, contrary to conventional wisdom.

RESEARCH METHODS

This study employs Net Interest Margin as the measurement of profitability. Definitions and measurements of the dependent variables are summarized in Table 1. The model used to estimate bank profitability faces a challenge due to potential endogeneity in the variables. The study assumes that exogenous variables are uncorrelated with the individual effects. A strict definition of an exogenous variable shows a variable that is not correlated with the idiosyncratic error term for all time periods. However, in the less strict definition, an exogenous variable is still allowed to be correlated with the specific error component, under the "fixed effect" model. Endogenous variables are predetermined and uncorrelated with future idiosyncratic errors but might be correlated with past errors.

Definitions and Measurement of Research Variables

Table 2. Dependent Variable: Bank's Profitability

Variable	Acronym	Measure	Expected Effect	Source
Profitability	NIM	Net Interest Margin / Net Loans	-	S&P Capital IQ

Table 3. Independent Variables: Risk Management

Variable	Acronym	Measure	Expected Effect	Source
Z-SCOREstd	Z-SCORE	*(ROA + (equity/assets)) / Standard Deviation of ROA*	-	S&P Capital IQ, Banks' annual reports, and author computation
Capital Adequacy Ratio	CAD	*Equity / Net Loans*	-	S&P Capital IQ
Volatility of NIM	VOL	*Standard Deviation of NIM*	-	S&P Capital IQ, Banks' annual reports, and author computation

Table 4. Independent Variable: Interest Rate

Variable	Acronym	Measure	Expected Effect	Source
Policy Interest Rate	INTR	*Policy Interest Rate (annual rate measured as average of monthly interest rates)*	+	Economist Intelligence Unit, Central Banks' Annual Report

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Table 5. Control Variables: Bank Factors

Variable	Acronym	Measure	Expected Effect	Source
Lending	LENDING	*Loan i,t / Total Assets i,t*	+	S&P Capital IQ
Equity	EQUITY	*Tier-One Equity i,t / Total Assets i,t*	+/-	S&P Capital IQ
SIZE	LnASSET	*Ln (Total Assets)*	+/-	S&P Capital IQ

Table 6. Control Variables: Macroeconomic Factors

Variable	Acronym	Measure	Expected Effect	Source
Inflation	INFL	Annual percentage change in Consumer Price Index	+	Economist Intelligence Unit
Real GDP Growth	GDP	Annual Real GDP Growth	+	Economist Intelligence Unit

1. Bank profitability: Net Interest Margin

Following Saksonova (2014), Borio et al. (2017), and Claessens et al. (2018), this study uses net interest margin (NIM) as a bank profitability indicator because it reflects a bank's capacity to manage its interest-bearing assets. Bustaman et al. (2017) find that banking stability in ASEAN-4 is determined by net interest margin, and that an increase in fee-based income from trading activities tends to contribute to increased bank instability.

Several studies have linked the net interest margin to the risk in banking institutions. A study by Angbazo (1997) shows that default and interest rate risk premiums are reflected in banks' net interest margins. Delis and Kouretas (2011) show that bank risk-taking increases significantly in a low-interest-rate environment.

2. Banks' risk management indicators: Z-score, CAD, and VOL

Credit risk has been recognized as the most important risk for banks, as noted in studies by Alshatti (2017) and Gilchrist and Mojon (2018). In this study, we focus on insolvency or bankruptcy risk as one of the most important risks banks must manage. The Global Financial Crisis in 2008 and the Asian Financial Crisis in 1997 demonstrate the importance of managing insolvency risk. The insolvency risk is proxied using the Z-score, the most widely used accounting measure, following Laeven and Levine (2011), Ramayandi et al. (2014), Nguyen and Boateng (2015), and Trad et al. (2017). A lower Z-score indicates an increased risk of insolvency or bankruptcy due to banks' failure to repay their debt obligations. The bank's Z-score measures the relationship between its capital and the variability of its return on assets. The ratio shows the capitalization and returns of assets to absorb the variability of return without causing bankruptcy.

Another indicator for banks' risk management is the ratio of total equity to net loans (CAD). Trad et al. (2017) show that the ratio of total equity to net loans is an important indicator of banks' financial resilience during financial crises. CAD provides a forward-looking indicator, similar to the Capital Adequacy Ratio (CAR). Maudos & Fernández de Guevara (2004) indicate that a higher CAR ratio is associated with stronger bank capital in avoiding insolvency, implying a positive impact of CAR on NIM. Soedarmono et al. (2013) and Claessens et al. (2018) find that banks with a large capital ratio invest more prudently, given their greater funding risk.

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The study uses volatility of the net interest margin (VOL) as a proxy for banks' prudential behavior. Saksonova (2014) indicates that during a downtrend, a higher volatility in the net interest margin can signal a negative outlook due to a lower average Z-score. Banks with high Z-scores signal low insolvency risk, underscoring the banking sector's high profitability and confidence.

3. Interest rate: INTR

The analysis in this study uses policy interest rates issued by the central banks in the respective countries in ASEAN-4, namely Bank Indonesia, Bank Negara Malaysia, Bank of Thailand, and Bangko Sentral ng Pilipinas. The data for the policy interest rate covers the period 2005-2019.

4. Control variables: EQUITY, SIZE, LENDING

The model in this study uses several ratios as bank control variables. This includes the equity-to-total-assets ratio (EQUITY), the size of banks' total assets, and the Asset Quality ratio, which is total net loans to total assets. Athanasoglou et al. (2008) find that a high level of capital may support bank profitability during an economic downturn and act as a buffer during a financial shock. A positive correlation between a bank's asset size and profitability has been found in the studies by Demirguc and Huizinga (1997) and Borio et al. (2017). The lending size and asset quality of the banks are measured by the ratio of total loans to total assets. Bikker & Metzemakers (2005) find that large loan portfolios generate higher interest income and may also increase the credit risk because lending is pro-cyclical.

5. Control variables: RGDP, INFL

The study uses real GDP growth (RGDP) as a control variable in the country-specific characteristics panel regression. The average consumer price Index (CPI) is used in this study as a control variable, capturing the pro-cyclical effect on profitability from changes in lending activity and provisioning.

a. Data description

The study focuses on four Southeast Asian countries: Indonesia, Malaysia, Thailand, and the Philippines. Z-score data depend on historical values; hence, the samples include only banks with more than 10 continuous observations to provide consistent Z-score values. The data in this study cover 79 banks from 2005 to 2019.

b. Model specifications

The models in this study use panel data regression to measure banks' profitability (Net Interest Margin), with two independent variables: risk management indicators and interest rates. The model includes control variables for both bank- and country-characteristics. The model is summarized as follows:

$$NIM_{i,j,t} = \alpha_0 + \alpha_1 RM_{i,j,t} + \alpha_2 INTR_{j,t} + \alpha_3 BANK\ CONTROL_{i,j,t} + \alpha_4 COUNTRY\ CONTROL_{j,t} + \varepsilon_{i,k,t} \quad (1)$$

Where:

$NIM_{i,j,t}$ denotes the bank profitability indicator for the bank *i,* in the country *j,* and year *t.*

$RM_{i,j,t}$ denotes the bank risk management indicators with three variables: Capital ratio (CAD), Insolvency ratio (Z-score$_{std}$), and volatility of NIM (VOL).

$INTR_{j,t}$ denotes the key policy interest rate in each country.

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$BANK\ CONTROL_{i,j,t}$ represents the set of bank characteristics: Size, Lending, Equity,

$COUNTRY\ CONTROL$ represents the set of country characteristics: Inflation (INFL) and Real GDP (RGDP)

$\varepsilon_{i,k,t}$ is an error term.

Following the dynamic nature of net interest margin (NIM) and unobserved heterogeneity across banks because of the differences in corporate governance and the moral hazard problem due to greater risk-taking behavior, which comes from cross-selling behavior, loan mispricing, and excessive loan growth (Soedarmono et al., 2013; Yusgiantoro, 2018), the possibility of having endogeneity becomes observable. Equation (1) may be endogenous due to loop causality among some net interest margin determinants or to reverse causality between net interest margin (bank profitability) and the interest rate, as shown in the study by Trujillo-Ponce (2012). The higher the profitability, the more likely banks are to have higher equity by increasing retained earnings and building them into capital, employing more aggressively in advertising, and, as a result, increasing the size of their assets, as shown by García-Herrero et al. (2011). Policymakers reduce key policy interest rates to contain a crisis or economic shock (Claessens et al., 2018). In a lower-interest-rate environment, banks are encouraged to take on more risk. Hence, Interest rate, bank control variables, and risk management variables are treated as endogenous variables in equation (1), while all macroeconomic control variables are treated as exogenous.

To address endogeneity, the study employs the Generalized Method of Moments (GMM) with the Arellano-Bover (1995) estimator. The GMM method allows transforming both exogenous and endogenous variables into first differences, where the exogenous variables are instrumented by themselves and the endogenous variables are instrumented by their own lags (in level) to address endogeneity.

To complete the study, an investigation is conducted to determine whether the relationship between profitability and risk management is contingent on interest rates. Hence, an interaction term between risk management and interest rates is added to equation (1).

$$NIM_{i,j,t} = \alpha_0 + \alpha_2 RM_{i,j,t} + \alpha_3 INTR_{i,j,y} + \alpha_4 RM_{j,t} * INTR_{j,t} + \alpha_5 BANK\ CONTROL_{i,j,t} + \alpha_6 COUNTRY\ CONTROL_{i,j,t}\varepsilon_{i.k,t} \quad \ldots. (2)$$

RESULTS AND DISCUSSION

In this section, a panel data regression is run to investigate the effects of interest rates and banks' risk management on bank profitability. Later in this section, the impact of banks' profitability at different interest rates and under different risk management strategies is also examined.

The effect of risk management and interest rates on profitability is presented in Table 7. Our results show that the Z-score, volatility of NIM, lending (which also represents asset quality), capital adequacy ratio, and equity to total assets are all significant in their relationships with profitability. The Z-score indicates greater confidence in the banking sector due to lower insolvency risk and promotes bank profitability. The results support Boadi et al. (2016), who state that profitability in the banking sector was promoted by sector stability. The volatility of NIM (VOL) has shown consistent negative correlations with high significance to banks' profitability. An increase in the volatility of the net interest margin provides a negative signal because it signals a

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lower Z-score or higher insolvency risk. This finding supports the Modern Portfolio Theory (Markowitz, 1952), which holds that banks optimize profitability by diversifying across sectors, geographies, and asset classes, thereby minimizing total variance (risk) for any given level of expected return.

The policy interest rate is highly significant in two of three regressions, indicating that banks are slow to lower deposit interest rates when the policy rate is cut; hence, interest expenses decline at a slower pace than interest income, reducing NIM. When banks' non-interest income is high, the impact of a decrease in NIM caused by low policy rates can be moderated by increases in the value of debt securities or government bonds held by banks.

Bank control variables indicate that EQUITY has a consistently negative and significant effect on profitability. This is in support of the Modigliani-Miller Theorem's capital Structure Irrelevance Theory (Modigliani, Miller, and Merton, 1958). In a heavily regulated banking system, this theory is modified by deposit insurance and tax asymmetry. Banks manage their Weighted Average Cost of Capital (WACC) by maintaining an optimal mix of equity, debt, and deposits to maximize overall enterprise value. Following the Enterprise Risk Management (Nocco & Stulz, 2006), integrating risk frameworks with the bank's strategic objectives, institutions ensure that the cost of capital aligns with risk-adjusted performance measures such as RAROC (Risk-Adjusted Return on Capital). RAROC is the fundamental metric banks use to determine which business lines are genuinely profitable (Stoughton & Zechner, 2004).

SIZE hurts profitability, as found by Martynova et al. (2021), who found that banks with large asset sizes and high profitability tend to take on greater substantive market risk, such as interest rate risk. LENDING has a positive and highly significant effect on profitability.

Inflation (INFL) as a country control variable shows consistent results, with significance at the 10 percent level. Higher inflation reduces bank profitability. Real GDP (RGDP) shows a positive relationship with profitability. High GDP growth improves banks' profitability.

The GMM estimates for equation (1) are shown in the bottom part of Table 7. The estimates show both validity (J-statistics) and consistency in the results, as reflected in the AR(1) and AR(2), with both p-values> 0.05.

Table 7. Equation (1): The correlations of risk management and interest rate to bank profitability

Variables	Common Effect	Fixed Effect	Random Effect
Z-SCORE	-0.00724	0.01118 **	0.0065 *
	(0.6390)	(0.8801)	(0.6390)
VOLATILITY	-0.56809 ***	-0.53762 ***	-0.5679 ***
	(20.3856)	(16.972)	(20.3856)
LENDING	0.22197 ***	0.09287 **	0.2246 ***
	(7.7640)	(1.135)	(7.7640)
CAD	-0.03018 *	-0.48593 ***	-0.0317 *
	(1.8369)	(6.2972)	(1.8369)
EQUITY	-0.12472 ***	-0.39278 ***	-0.1253 ***
	(4.8543)	(3.8677)	(4.8543)
SIZE	-0.00887 **	-0.001 *	-0.0091 **
	(2.4427)	(0.1034)	(2.4426)
INTR	0.05452	0.12998 *	0.0549 **
	(1.2607)	(1.021)	(1.0607)
RGDP	0.00399	0.0021 *	0.0039
	(1.012)	(0.5129)	(1.0124)

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INFL	-0.00721 *	-0.0068 *	-0.0074 *
	(0.2361)	(0.2090)	(0.2361)
CONSTANT	0.06252 *	0.09369	0.06248 *
	(1.7052)	(1.4772)	(1.7052)
Adjusted R-squared	0.40635	0.43767	0.4046
F-statistics	90.518	11.5298	89.8656
Probability (F-statistics)	(0.0000)	(0.0000)	(0.0000)
Durbin-Watson Statistics	2.0684	2.1722	2.0774
Total Number of Observations	1178	1178	1178
GMM Estimates			
Number of instruments	79		
J-Statistics	70.1329		
Probability (J-Statistics)	(0.4393)		
AR (1) (p-value)	0.2710		
AR (2) (p-value)	0.8848		

Notes: t-statistics are in parentheses.
****, **, and* denote statistical significance at 0.01, 0.05, and 0.10 level, respectively.*
AR (1) and AR (2) are tests for first and second-order autocorrelation based on the Arellano-Bond Serial Correlation Test (1995) for GMM estimates.

The equation (2) models the correlation of risk management on bank profitability for different levels of interest rates. Table 8 shows the outcomes of equation (2). The coefficients of interest rate (INTR) and risk management variables (Z-Score, volatility of NIM, and capital adequacy) have different meanings. The levels of significance of these variables are high. For instance, a value of 0.2642 for INTR at a 1 percent p-value indicates that a 1 percentage point increase in the interest rate increases banks' profitability by 0.2642% when banks do not manage risk. The interaction term between risk management and interest rate level (INTRPB) shows a significant negative relationship with the Z-score.

In contrast, the volatility of NIM and the capital adequacy ratio have significant positive relationships with the Z-score. Therefore, a stronger relationship between interest rates and profitability occurs when banks are better at managing their risk. It is achieved when the Z-score decreases and CAD and VOL increase.

The finding also shows a significant positive effect of the interest rate on VOL and CAD, indicating that higher policy interest rates lead to greater NIM volatility, less profitable operations, and lower bank returns.

Table 8. Equation (2): The relationship of interest rate and risk management to bank profitability, with an interaction term of Risk Management and Interest Rate

Variables	**Common Effect**	**Fixed Effect**	**Random Effect**
Z-SCORE	-0.09302 ***	-0.0652 **	-0.0935 ***
	(3.6454)	(2.1732)	(3.7156)
VOLATILITY	0.44069 ***	0.4732 ***	0.4408 ***
	(10.9763)	(10.4452)	(11.1387)
LENDING	0.1971 ***	0.0667	0.1991 ***
	(6.8111)	(0.8599)	(6.9083)
CAD	0.0457 *	0.4011 ***	0.0445 *
	(1.9192)	(4.5541)	(1.8826)
EQUITY	0.0688 **	0.3756 ***	0.0693 **
	(2.4135)	(3.6884)	(2.4383)

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SIZE	0.00815 **	-0.0029	-0.0083 **
	(2.2597)	(0.2960)	(2.3172)
INTRPB	-0.1380 ***	-0.0750 **	-0.1379 ***
	(4.3768)	(1.9869)	(4.4343)
INTR	0.3106 ***	0.2642 ***	-0.3307 ***
	(4.2809)	(0.0058)	(4.3366)
RGDP	0.0043	0.0024 *	0.0042
	(1.0868)	(2.7651)	(1.0938)
INFL	-0.0027 *	-0.0079 *	-0.0024 *
	(0.0835)	(0.5767)	(0.0815)
CONSTANT	0.3055 ***	0.2160 **	0.3051 ***
	(4.6025)	(2.4455)	(4.6505)
Adjusted R-squared	0.4154	0.4392	0.4139
F-statistics	84.6482	11.4745	84.1450
Probability (F-statistics)	(0.0000)	(0.0000)	(0.0000)
Durbin-Watson Statistics	2.1072	2.194	2.1057
Total Number of Observations	1178	1178	1178
GMM Estimates			
Number of instruments	79		
J-Statistics	72.1676		
Probability (J-Statistics)	(0.3419)		
AR (1) (*p-value*)	0.2091		
AR (2) (*p-value*)	0.8856		

Notes: t-statistics are in parentheses.
****, **, and * are statistically significant at the 0.01, 0.05, and 0.10 levels, respectively.*
AR (1) and AR (2) are tests for first and second-order autocorrelation based on the Arellano-Bond Serial Correlation Test (1995) for GMM estimates.

The GMM estimates for equation (2) are shown in the bottom part of Table 8. The estimates show both validity (J-statistics) and consistency in the results, as reflected in the AR(1) and AR(2), with both p-values > 0.05.

CONCLUSION AND RECOMMENDATIONS

The study examines the effects of interest rates and banks' risk management on banks' profitability, as measured by net interest margin (NIM), across public-listed banks in ASEAN-4 countries (Indonesia, Malaysia, Thailand, and the Philippines) from 2005 to 2019. Despite different stages of economic development and the size of the economies being varied among these 4 ASEAN countries, the results conclude similar findings that the banks' way in managing their risk, as measured by the variables of volatility of NIM, Z-score, and capital adequacy ratio, reflects the way banks' prudential behavior in managing their risks and profitability. The study uses panel data regression models and the Generalized Method of Moments to address endogeneity problems in dynamic panel regressions of bank profitability.

This study provides evidence that higher Z-scores among ASEAN-4 banks improve bank profitability and supports the view that profitability is driven by financial stability (higher Z-scores or lower default risk) in the banking sector. As expected, the capital requirement, as reflected in the CAD, has shown a highly significant impact on profitability. During periods of lower interest rates, banks' profits from traditional lending activities may decline. In anticipation of lower profitability, banks may have diversified their revenue streams into fee-based income (commission and fees) and/or trading activity, which may pose prudential and macro stability issues. The study shows the importance of banks having higher-quality core capital, or Tier-1 Capital, which will

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strengthen their ability to absorb losses without necessarily leading to a significant reduction in profitability. This result encourages central banks to support strengthening the quality of Tier-1 capital or core equity.

The profitability of banks, as measured by net interest margin, is expected to decline in the future due to greater competition from financial technology innovations. However, this can be seen as a positive development rather than a negative one, since it suggests greater efficiency in deploying the asset's utilization towards digital opportunities. Further research on Net Interest Margin among big-sized banks can incorporate the rise of high-volume, low-yield transactional channels and fintech adoption that may heighten price transparency and rate shopping by banks'customer

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REFERENCES

Abbas, F., Iqbal, S., & Aziz, B. (2019). The impact of bank capital, bank liquidity and credit risk on profitability in postcrisis period: A comparative study of U.S. and Asia. *Cogent Economics & Finance, 7*(1). https://doi.org/10.1080/23322039.2019.1605683

Adrian, T., & Shin, H. S. (2010). Liquidity and leverage. *Journal of Financial Intermediation, 19*(3), 418–437. https://doi.org/10.1016/j.jfi.2008.12.002

Albertazzi, U., & Gambacorta, L. (2009). Bank profitability and the business cycle. *Journal of Financial Stability, 5*(4), 393–409. https://doi.org/10.1016/j.jfs.2008.10.002

Alessandri, P., & Nelson, B. D. (2014). Simple banking: Profitability and the yield curve. *Journal of Money, Credit and Banking, 47*(1). https://doi.org/10.1111/jmcb.12172

Angbazo, L. (1997). Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking. *Journal of Banking & Finance, 21*(1), 55–87. https://doi.org/10.1016/S0378-4266(96)00025-8

Athanasoglou, P., Brissimis, S., & Delis, M. (2008). Bank-specific, industry-specific, and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money, 18*(2), 121–136. https://doi.org/10.1016/j.intfin.2006.07.001

Bikker, J. A., & Metzemakers, P. A. J. (2005). Bank provisioning behaviour and procyclicality. *Journal of International Financial Markets, Institutions and Money, 15*(2), 141–157. https://doi.org/10.1016/j.intfin.2004.03.004

Bikker, J. A., & Vervliet, T. (2017). Bank profitability and risk-taking under low interest rates. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3002480

Boffey, R., & Robson, G. N. (1995). Bank credit risk management. *Managerial Finance, 21*(1), 66–78. https://doi.org/10.1108/eb018497

Bolt, W., de Haan, L., Hoeberichts, M. M., van Oordt, M. R. C., & Swank, J. (2012). Bank profitability during recessions. *Journal of Banking & Finance, 36*(9), 2552–2564. https://doi.org/10.2139/ssrn.1948483

Borio, C., Gambacorta, L., & Hofmann, B. (2017). The influence of monetary policy on bank profitability. *International Finance, 20*(1), 48–63. https://doi.org/10.1111/infi.12104

Camara, B., Lepetit, L., & Tarazi, A. (2013). Ex ante capital position, changes in the different components of regulatory capital and bank risk. *Applied Economics, 45*(34), 4831–4856. https://doi.org/10.2139/ssrn.1496818

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Claessens, S., Coleman, N., & Donnelly, M. (2018). "Low-for-long" interest rates and banks' interest margins and profitability: Cross-country evidence. *Journal of Financial Intermediation, 35*, 1–16. https://doi.org/10.1016/j.jfi.2017.05.004

Delis, M. D., & Kouretas, G. P. (2011). Interest rates and bank risk-taking. *Journal of Banking & Finance, 35*(4), 840–855. https://doi.org/10.1016/j.jbankfin.2010.09.032

Fang, J., Lau, C. K. M., Lu, Z., Tan, Y., & Zhang, H. (2019). Bank performance in China: A perspective from bank efficiency, risk-taking and market competition. *Pacific-Basin Finance Journal, 56*, 290–309. https://doi.org/10.1016/j.pacfin.2019.06.011

García-Herrero, A., Gavilá, S., & Santabárbara, D. (2011). What explains the low profitability of Chinese banks? *Journal of Banking & Finance, 33*(11), 2080–2092. https://doi.org/10.2139/ssrn.1413123

Gilchrist, S., & Mojon, B. (2018). Credit risk in the euro area. *The Economic Journal, 128*(608). https://doi.org/10.1111/ecoj.12427

Laeven, L., & Levine, R. (2011). Bank governance, regulation, and risk taking. *Journal of Financial Economics, 93*(2), 259–275. https://doi.org/10.2139/ssrn.1142967

Martynova, N., Ratnovski, L., & Vlahu, R. (2021). Bank profitability and risk-taking. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2727214

Maudos, J., & Fernández de Guevara, J. (2004). Factors explaining the interest margin in the banking sectors of the European Union. *Journal of Banking & Finance, 28*(9), 2259–2281. https://doi.org/10.1016/j.jbankfin.2003.09.004

My, S. T., & Quoc, A. N. (2022). The relationship between credit risk and bank financial stability: The mediating role of bank profitability. *Journal of Hunan University Natural Sciences, 49*(1), 263–271. https://doi.org/10.55463/issn.1674-2974.49.1.32

Nguyen, J., Parsons, R., & Argyle, B. (2021). An examination of diversification on bank profitability and insolvency risk in 28 financially liberalized markets. *Journal of Behavioral and Experimental Finance, 29*. https://doi.org/10.1016/j.jbef.2020.100416

Nguyen, V. H. T., & Boateng, A. (2015). An analysis of involuntary excess reserves, monetary policy, and risk-taking behavior of Chinese banks. *International Review of Financial Analysis, 37*, 63–72. https://doi.org/10.1016/j.irfa.2014.11.013

Nocco, B. W., & Stulz, R. M. (2006). Enterprise risk management: Theory and practice. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.921402

Raddatz, C., Kerry, W., & Caparusso, J. (2020). *Global financial stability report: Markets in the time of COVID-19*. International Monetary Fund.

Ramayandi, A., Rawat, U., & Tang, H. C. (2014). *Can low interest rates be harmful: An assessment of the bank risk-taking channel in Asia* (Working Papers on Regional Economic Integration No. 123). Asian Development Bank.

Saksonova, S. (2014). The role of net interest margin in improving banks' asset structure and assessing the stability and efficiency of their operations. *Procedia - Social and Behavioral Sciences, 150*, 132–141. https://doi.org/10.1016/j.sbspro.2014.09.017

Saunders, A., Schumacher, L., & Schiff, J. M. (2000). The determinants of bank interest rate margins: An international study. *Journal of International Money and Finance, 19*(6), 813–832. https://doi.org/10.1016/S0261-5606(00)00033-4

Soedarmono, W., Machrouh, F., & Tarazi, A. (2013). Bank competition, crisis, and risk taking: Evidence from emerging markets in Asia. *Journal of International Financial*

Vol. 4 No. 2, June 2026 | E-ISSN: 2987-7407 | DOI: https://doi.org/10.70716/ecoma.v4i2.478

Markets, Institutions and Money, 23, 196–221. https://doi.org/10.1016/j.intfin.2012.09.009

Stoughton, N. M., & Zechner, J. (2004). Optimal capital allocation using RAROC and EVA. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.490341

Tan, Y., Floros, C., & Anchor, J. (2017). The profitability of Chinese banks: Impacts of risk, competition and efficiency. *Review of Accounting and Finance, 16*(1), 86–105. https://doi.org/10.1108/RAF-05-2015-0072

Trad, N., Trabelsi, M. A., & Goux, J. F. (2017). Risk and profitability of Islamic banks: A religious deception or an alternative solution? *European Research on Management and Business Economics, 23*(1), 40–45. https://doi.org/10.1016/j.iedeen.2016.09.001

Turgut, T. (2018). *Risk management process in banking industry* (MPRA Paper No. 86427). Munich Personal RePEc Archive.

Yusgiantoro, I. (2018). What determines loan rate and default status in financial technology online direct lending? Evidence from Indonesia. *Emerging Markets Finance and Trade, 56*(2). https://doi.org/10.1080/1540496X.2019.1605595