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The Bank Concentration and Risk Exposure: Empirical Insights from Asian Countries

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Abstract

Background: The relationship between bank rivalry and stability is a subject of discussion in both theoretical and empirical research. The two competing theories, the (1) competition-stability and (2) competition-fragility theories, provide an alternate explanations, leading to controversy over the merger and acquisition policies implemented by Asian governments. This

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study examines the influence of bank rivalry, profitability, diversity, efficiency, and liquidity on bank stability in Asian countries.

Methods: This study used annual data from 11 Asian countries spanning 14 years (2007-2020) and comprising 154 observations. The secondary data were extracted from the Global Financial Development Database (2023). The unit root test, cointegration test, and random effect model were the main methods employed in this work to assess stationarity, long-term relationships, and the influence of bank competition on stability in Asian nations, respectively.

Results: The findings revealed that the bank concentration ratio ($\beta = 1.975$, $p < .01$) and cost-to-income ratio ($\beta = -.375$, $p < .01$) negatively affect bank stability, while the noninterest income-to-total income ratio ($\beta = .180$, $p < .05$), credit-to-deposit ratio ($\beta = .346$, $p < .01$), liquid assets-to-deposit ratio ($\beta = .087$, $p < .05$), and net interest margin ($\beta = .036$, $p < .05$) positively affect bank stability in Asian countries.

Conclusion: This study concludes that bank competition and efficiency negatively affect bank stability, while income diversification, profitability, and liquidity positively affect bank stability in Asian countries.

Novelty: Using a more recent dataset, this study analyzes the effects of competition on stability through cross-country analysis. This also offers extensive literature on the Asian context.

Keywords: bank competition, stability, profitability, efficiency, liquidity

Introduction

The banking industry plays a significant role in channeling funds from surplus units to deficit units. Instability in the banking sector significantly disrupted both lending and payment mechanisms, which reduced both credit availability and demotivated individual savers to deposit in the banking system and slowed economic growth. In addition, bank failure has a contagion effect on the whole financial system (Berger et al., 2009). The empirical evidence and the theoretical foundation about the connection between bank rivalry and stability/fragility remain equivocal. The competition-stability hypothesis (CHS) advocates that banks can earn more interest income by imposing a high interest rate at a lower level of competition. Higher interest rates impose higher interest costs on borrowers, increasing loan default rates and moral hazard problems by investing funds in risky projects. Thus, the risk of bank vulnerability increases (Boyd & De Nicolo, 2005). In addition, in a highly concentrated market, banks can charge excessive prices compared to competitive levels without employing any cost control measures and thus cannot become cost-efficient firms (Berger & Hannan, 1998). Conversely, higher competition inspires banks to decrease operating costs and build a solid customer base by offering quality service at reasonable prices, thus increasing revenue and improving bank stability (Yuan et al., 2022).

Similarly, management does not believe that it is necessary to reduce expenses, leading to reduced cost-effectiveness within the increasingly consolidated banking sector. Conversely, heightened competition may cause a decrease in loan interest rates, a decline in credit risk for

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borrowers, and an improvement in overall financial stability (Jiménez et al., 2013). Conversely, the competition-fragility hypothesis (CFH) contends that in a competitive market, numerous banks endeavor to secure deposits and loans from the same groups, which exacerbates moral hazard issues and induces banks to intentionally take on additional risks. Furthermore, banks are incentivized to assume greater risks as a result of the erosion of market power, profit margins, and franchise value by excessive competition (Berger et al., 2009).

Intense competition leads to a decline in profits for monopolies, which in turn lowers the value of franchises. As the value of a franchise decreases, the losses resulting from bankruptcy also drop, which encourages banks to assume greater risk in their operations. As a result, the rise in risk-taking behavior amplifies the vulnerability of the bank (Yuan et al., 2022). Therefore, a higher level of competition in the lending market leads to a decrease in the interest rate, which in turn reduces the borrowing costs for borrowers. The decrease in expenses also results in a reduction in the default rate of loans, so enhancing the stability of banks. Conversely, while there is a high competition in the deposit market, financial institutions have to provide higher interest rates on deposits. This leads to a remarkable increase in the cost of acquiring funds for these institutions. An increase in expenses reduces the profitability of banks, leading them to pursue greater returns by assuming more risks, exacerbating the instability of banks.

Recent empirical studies have shown controversial empirical findings on the links between bank competition and risk exposure. For instance, Albaity et al. (2019), Islam et al. (2020), and Nguyen et al. (2023) advocate for a CSH, while Yitayaw et al. (2023) and Ferreira et al. (2023) advocate for a CFH. In the same vein, the theoretical justification for the correlation between stability and profitability is contested. The fragility of banks is exacerbated by trade-off theory, which posits that increased profitability is correlated with increased risk. In contrast, complementary theory posits that profitability is directly correlated with bank stability, suggesting that profitable banks are capable of mitigating economic disruptions in the event of deteriorating economic conditions. Nevertheless, the majority of recent studies (e.g., Nguyen & Le, 2022; Tran et al., 2022; Shahriar et al., 2023) have demonstrated a beneficial correlation between profitability and bank stability. In the same vein, the influence of income diversification and bank stability was either positive or negative. Previous studies by Shahriar et al. (2023) and Yarsa Sarpong and Adu-Asare Idun (2024) demonstrated a positive impact, while the previous studies by Liang et al. (2020) and Pham et al. (2021) demonstrated a negative impact. Additionally, there was a conflicting result in the relationship between bank stability and efficacy. A positive impact was observed in previous studies conducted by Tran et al. (2022) and Yitayaw et al. (2023), whereas a negative impact was observed in the study conducted by Diab et al. (2023). Additionally, the current literature has demonstrated that the relationship between liquidity and bank stability is not uniform. A negative association was observed in Dutta and Saha (2021) and Bandyopadhaya and Saxena (2023), while a positive association was observed in Ahmad et al. (2022) and Tran et al. (2022).

The theoretical explanations and empirical findings have distinct outcomes. Hence, no consensus has been reached in this field. In addition, most of the abovementioned literature

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belongs to the developed world, which is quite different from most Asian countries. Therefore, this study fills this void by supplying additional literature about Asian countries using a more recent dataset from the Global Financial Development Database (GFDD).

The subsequent section of the investigation is arranged as follows. Section two of the study critically examines the relevant literature, while section three delineates the research methods including specifications of the empirical models. Section four of the study elucidates the empirical findings. Furthermore, section five is dedicated to the discussion. Ultimately, the study ends with the conclusions in section six.

Research Objective

This investigation is designed to investigate the concurrent influence of profitability, efficiency, diversification, competition, and liquidity on the stability of banks in Asian countries.

Literature Review

Bank competition and stability/fragility

Two opposing hypotheses, competition-fragility and competition-stability, offer conflicting explanations for the relationship between bank competition and stability/fragility. In a similar vein, more recent empirical evidence suggests that there is a positive and negative relationship between bank competition and stability in developed, emerging, and underdeveloped economies. Phan et al. (2019) conducted a study on the competition, efficacy, and stability of East Asian commercial banks from 2004 to 2014. They found that competition negatively affects banks' stability, supporting the CFH. Intensive competition in the banking industry can decrease interest income and increase nonperforming loans by decreasing lending rates and relaxing lending criteria. Similarly, Misra and Coccorese (2022) examined the influence of dominant market position on stability from 2005 to 2019 and found that greater efficiency contributes to stability, favoring the competition-fragility perspective. The study also revealed that Indian banks gain market power more through cost-saving methods than through price increases, with larger banks facing challenges despite potential economies of scale.

Similarly, Yitayaw et al. (2023) observed that bank concentration had a detrimental effect on bank stability in the Ethiopian context and substantiated the CFH by employing the system generalized method of moments (GMM). This finding is congruent with a previous study by Tan and Floros (2014), suggesting that increased competition leads to higher systematic risk, such as a decline in net worth, rising risk-taking behavior, and a greater probability of bank failure. In the same vein, Ferreira et al. (2023) conducted a recent study that substantiated the CFH, suggesting that the stability of the EU banking industry is adversely affected by an increase in competition.

In contrast, Islam et al. (2020) examined how product market competition affects the bank stability of Southeast Asian countries. Sixty-three banks in five ASEAN nations from 2009 to 2017 were analyzed, with 567 observations. Using dynamic GMM estimations, this study

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showed that competition favorably affected financial stability. The results supported the CSH by demonstrating that higher market position leads to lower insolvency risk. Similarly, the effect of competition on bank stability/fragility in Vietnam during the period from 2016 to 2021 was investigated by Nguyen et al. (2023). Through the application of panel corrected standard errors (PCSE), it was determined that bank competition positively influences bank stability. Conversely, a negative relationship was observed when bank competition was examined in conjunction with shadow banking. The findings of this investigation are in remarkable alignment with the findings of Agoraki et al. (2011), who indicate that financial institutions with prominent market dominance tend to opt for decreased credit exposure. This, in turn, diminishes the likelihood of loan defaults, subsequently enhancing the overall stability of these banks. Additionally, Albaity et al. (2019) investigated the impact of competition on the stability of banks in 18 MENA countries, utilizing data from 276 banks between 2006 and 2015. The two-step GMM approach posits that banks in less competitive markets exhibit higher profitability but lower bankruptcy and credit risks. Furthermore, the research indicates that the fragility of Islamic banks in MENA countries is more significantly influenced by competition than that of conventional banks.

Based on the more recent empirical studies above, this study proposes the following research hypothesis.

H_1: Bank competition significantly positively/or negatively impacts bank stability in Asian countries.

Profitability and stability

Ali and Puah (2019) investigated the variables that affect the financial stability and sustainability of institutions in Pakistan's banking sector. They discovered that bank stability is significantly influenced by bank size, liquidity risk, funding risk, and profitability, while credit risk is not. Kasri and Azzahra (2020) found that profitability, as measured by return on assets (ROA), had a positive impact on bank stability in Indonesia. This was accomplished by employing a dynamic panel model. In addition, Chandramohan et al. (2022) employed a panel dataset of 48 banks to examine the impact of diversification on the stability of commercial banks in India. They discovered that the stability of banks is positively influenced by the return on equity (ROE), which implies that profitable banks can withstand shocks through retained earnings. In the same vein, Nguyen and Le (2022) conducted an analysis of the relationships between bank profitability, stability, and loan growth in South Asian countries. They noted that stability is positively affected by profitability. In the MENA region, Shahriar et al. (2023) also discovered a robust positive correlation between profitability and bank stability, indicating that banks must improve profitability. Diab et al. (2023) investigated the impact of political risk and corporate governance on bank stability and identified a significant correlation between ROA, bank stability, and credit risk. This study proposes a subsequent research hypothesis in accordance with the more recent empirical studies mentioned above.

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H_2: Bank profitability significantly positively/or negatively impacts bank stability in Asian countries.

Efficiency and stability

Tran et al. (2022) found that lower competition and capital negatively impact financial stability, with a higher cost-to-income (CTI) ratio lowering profitability and increasing fragility. Yitayaw et al. (2023) found that efficiency is crucial for bank stability, with improved profitability and long-term stability. Diab et al. (2023) found a positive relationship between CTI and stability, with higher costs leading to lower bankruptcy risk and improved stability. Yarsa Sarpong and Adu-Asare Idun (2024) found that information dissemination in bank diversification channels in Ghana impacts bank resilience, but cost-to-income did not significantly affect systematic risk. Based on the more recent empirical studies above, this study proposes the following research hypothesis.

H_3: Bank efficiency significantly negatively impacts bank stability in Asian countries.

Income Diversification and Stability

Tariq et al. (2021) found that bank maturity leads to improved income diversification through factors such as reputational capital, a large customer base, established networks, and strong financial and knowledge resources. Diversification has a strong favorable influence on bank stability. Similarly, another study by Shariar et al. (2023) revealed that diversification has a significant beneficial impact on stability, potentially mitigating credit risk exposure and offering a more consistent source of income. Le (2021) found that geographic diversification positively impacts bank stability, while income diversification has a negative impact. Yarsa Sarpong and Adu-Asare Idun (2024) found that income diversification mitigates systematic risk and strengthens bank stability. In contrast, Liang et al. (2020) found that diversification negatively impacts bank stability in the MENA region. Similarly, Pham et al. (2021) repoted that diversification unfavorably impacts stability in Vietnam due to the entry of foreign and private banks, which brings more sophisticated products and services at lower costs, ultimately increasing operating costs and decreasing bank stability. Based on the abovementioned more recent empirical studies, this study proposes the following research hypothesis.

H_4: Income diversification significantly positively/or negatively impacts bank stability in Asian countries.

Liquidity and stability

Le et al. (2019) and Tran et al. (2022) observed that liquidity negatively impacts bank stability in Vietnam and emerging economies, as higher liquidity assets lead to low profitability and increased risk. They also found an opposite link between liquidity and stability, with higher liquidity ratios increasing risk and fragility in banks. Conversely, Dutta and Saha (2021) conducted a study on the influence of competition and efficacy on financial stability in the Bangladesh banking sector and discovered that liquidity has a positive impact on stability.

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Similarly, López-Penabad et al. (2021) observed that liquidity positively influences bank stability depending on countries' prevailing financial stability conditions, where a positive impact would be seen with stable banking systems and a negative impact in countries with less stable ones. Bandyopadhyay and Saxena (2023) discovered that liquidity exerts a notable positive influence on the stability of banks, implying that financial institutions endowed with enhanced capacity to fulfill short-term liabilities exhibit greater stability. A diminished liquidity ratio may result in heightened instability. Based on the abovementioned more recent empirical studies, this study proposes the following research hypothesis.

H_5: Liquidity significantly positively/or negatively impacts bank stability in Asian countries.

Methods

Research design

This study is directed by positivism philosophy, uses quantitative approach, and deducting reasoning. This study used descriptive, relational, and causal research designs. A descriptive research design is employed to delineate the essential attributes of the variables under investigation. The relational research design is used to investigate multicollinearity issues in the predictor variables and the causal research design is employed to investigate the influence of competition, profitability, diversification, efficiency, and liquidity on the stability of banks in Asian nations.

Sample and data source

This study obtained balanced panel data from the World Bank (Global Financial Development Database, 2023). The sample countries, sample periods and number of observations are summarized in Table 1.

Table 1: Countries, sample period and Observations.

S. N.	Country	Period	Observations
1	Afghanistan	2007-2020	14
2	Bangladesh	2007-2020	14
3	India	2007-2020	14
4	Nepal	2007-2020	14
5	Pakistan	2007-2020	14
6	China	2007-2020	14
7	Singapore	2007-2020	14
8	Thailand	2007-2020	14
9	Indonesia	2007-2020	14
10	Malaysia	2007-2020	14
11	Japan	2007-2020	14
	Total		154

Note. Global Financial Development Database (2023).

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Variable definition

This study employed three variables, response, predictor, and control variables.

Dependent variable

This study employs the Z-score as a tool for evaluating the stability of banks by incorporating measures of profitability, leverage, and return volatility, congruent with Shahriar et al. (2023) and Ferreira et al. (2023). A positive association exists between increased profitability and capital adequacy while showing a negative relationship with unpredictable earnings. A higher Z-score signifies a reduced probability of insolvency, positioning it as a more precise measure of company stability than other risk metrics.

Z-score = (ROA + E/TA)/ $\sigma_{(ROA)}$

The equation represents the ROA and equity to total assets (E/TA) over a specific time period, with σ(ROA) representing the standard deviation.

Independent variable

This study used the 3-bank concentration (BCR_3) ratio as a bank competition measure. This measure, based on earlier research by Phan et al. (2019), Yitayaw et al. (2022), and Tran et al. (2022), evaluates the assets of the three largest banks in relation to overall commercial banking assets. When the bank concentration ratio is higher, there is less bank rivalry.

Control variables

The control variables employed in this investigation were profitability, diversification, efficiency, and liquidity. This finding is consistent with previous research conducted by Abbas and Ali (2022) and Sahul Hamid et al. (2017), who quantified the profitability variable—ROA—as net income before tax divided by total assets. In the same vein, Tran et al. (2020) evaluated an additional profitability variable, the net interest margin (NIM), by dividing the difference between interest income and interest expenses by total assets. Consistent with the research conducted by Sahul Hamid et al. (2017), Naili and Lahrichi (2022), and Chandramohan et al. (2022), the diversification variable, noninterest income-to-total income (NIITI), is determined by dividing noninterest income by total income. In addition, the cost-to-income ratio (CIT) is employed to evaluate the control variable's efficacy, as per the research conducted by Sahul Hamid et al. (2017), Phan et al. (2019), and Tran et al. (2022). Finally, liquidity is assessed through the credit-to-deposit ratio (CTDR) and the liquid assets-to-deposit ratio (LATD), as per the research conducted by Wu et al. (2020), Le et al. (2023), Abbas and Ali (2022), and Yitayaw et al. (2022).

Model specification

The study considers pooled OLS, fixed-effects (FE), and random-effects (RE) models, and an appropriate choice is made based on different tests. The pooled OLS implies that all individual countries are alike and maintain their features throughout time (Gujarati & Dawan, 2015). As

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a result, the pooled OLS model has a consistent constant and coefficient across different nations and periods.

$$Y_{it} = \alpha + \beta X_{it} + K_{it} + u_{it} \ldots\ldots (1)$$

The FE model assumes country-specific constants (μ_i), while coefficients remain constant.

$$Y_{it} = \alpha + \beta X_{it} + K_{it} + \mu_i + v_{it} \ldots\ldots (2)$$

The RE model indicates that all countries have a mean value for the intercept (α). The error term ϵ_i reflects the variation in intercept values across each country.

$$Y_{it} = \alpha + \beta X_{it} + K_{it} + \epsilon_i + v_{it} \ldots\ldots (3)$$

In this study, the following regression model is used (Budhathoki et al. 2024).

$$Z\text{-score}_{it} = \alpha_0 + \beta_1 BCR_{it} + \sum_{m=1}^{M} \beta m Xm, it + \mu_{it} \ldots\ldots\ldots (4)$$

Where, $Z\text{-score}_{it}$ represents the stability metric for country i at time t. The symbol α_0 represents the intercept. BCR_{it} denotes the bank concentration ratio of nation i at time period t. X_m denotes the control variables: profitability, diversification, efficiency, and liquidity. The profitability metrics are ROA and NIM. ROA_{it} represents a country's return on assets at a given point in time. NIM_{it} represents country i's net interest margin at time t. The income diversification is measured by NIITI. $NIITI_{it}$ represents the ratio of noninterest income to total income for nation i at time t. The cost-to-income ratio assesses the efficiency variable. CIR_{it} denotes the cost-to-income ratio of nation i at t. Liquidity is measured by the credit-to-deposit ratio, as well as the ratio of liquid assets to deposits. CDR_{it} denotes the credit-to-deposit ratio of nation i at time t. $LATDR_{it}$ is the ratio of liquid assets to deposits and short-term borrowing for country i during period t. t represents the time period from 2007 to 2020, while i represents the country.

Results

Prior to the regression model deployment, critical diagnostic tests were conducted in the present investigation. Diagnostic experiments were conducted prior to the regression model's implementation. During the initial phase, the study employed three distinct types of unit root tests: (1) the Levin, Lin, and Chu (LLC) tests; (2) the Im, Pesaran, and Shin (IPS) tests; and (3) the ADF-Fisher chi-square test. The stationary nature of all variables in the study at the first difference is demonstrated by the results in Table 2. Furthermore, the Pedroni residual panel cointegration test, which incorporates both within-dimension and between-dimension approaches, as well as the Kao residual cointegration test, were included in the analysis. The results of the Pedroni residual panel cointegration test and the Kao residual cointegration test are presented in Table 3. The Pedroni cointegration test results indicated that a plurality of six outcomes were statistically significant at the 1% level of significance, indicating a long-term relationship among the variables examined. The Kao residual cointegration test results also indicated a long-term association among all variables examined ($p < .05$).

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Table 2: Outcomes of Panel Unit Root Tests

Variables	LLC t-Statistics		IPS w-Statistics		ADF- Fisher chi-square	
	Level	First difference	Level	First difference	Level	First difference
Z-score	-4.069***	-3.552***	-.759	-3.937***	27.689	54.964***
BCR_3	-5.223 ***	-6.077***	2.179**	-3.482***	42.617***	50.317***
NIITI	-2.414***	-2.243***	-.530	-2.748***	24.791	42.713***
CTI	-3.523***	-3.731***	-1.867**	-4.339***	34.841**	58.629***
ROA	-3.444***	-11.360***	-3.511***	-8.616***	49.619**	101.113***
NIM	-3.280***	-12.091***	2.276**	-9.544***	43.816*	136.751***
CTDR	-2.256**	-7.965***	-.856	-5.612***	28.364	72.539***
LATD	-1.605*	6.929***	.357	-4.473***	26.319	64.650***

Note. ***, **, and * denote that correlation are significant at the 1%, 5%, and 10% level, respectively.

Table 3: Outcomes of Panel Cointegration Test

"Panel A: Pedroni Residual Cointegration Test"				
Pedroni Panel Cointegration Test (within-dimension)				
	Statistics	p-value	Weighted statistics	p-value
Panel v-Statistics	-1.171	.879	-1.142	.873
Panel rho-Statistics	2.479	.993	2.259	.995
Panel pp-Statistics	-5.235	.000	-4.729	.000
Panel ADF-Statistics	-4.938	.000	-4.681	.000
Pedroni Panel Cointegration Test (Between-dimension)				
			Statistics	p-value
Group rho-Statistics			4.072	1.000
Group pp-Statistics			-6.257	.000
Group ADF-Statistics			-5.461	.000
Panel B: Kao Residual Cointegration Test				
			t-statistics	p-value
ADF			-5.635	.000

The summary statistics in the study consisted of the min., mean, and standard deviation (SD) and max. Table 4 presents the descriptive information related to the dependent and independent variables spanning from 2007 to 2020. The Z-score ranged from 3.420 to a maximum of 36.960, with an average of 17.486. The SD, as a measure of dispersion, indicates that the mean value of the Z-score exhibits considerable variability. The BCR fluctuates from 16.140 to 100, resulting in an average of 50.232. The SD of the BCR shows substantial deviation from the

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mean value. ROA fluctuates between -1.840 and 4.540, with an average of 1.436. The SD of ROA shows limited dispersion from the mean value. Similarly, the NIM varies from .590 to 11.034, resulting in an average of 3.375. The SD of the NIM did not significantly deviate from the mean value. The diversification metric, noninterest income to total income (NIITI), ranges from 12.690 to 61.890, with an average of 31.139. The SD of the NIITI indicates the minimal deviation from the mean value. Furthermore, the cost-to-income ratio fluctuates from 30.320 to 98.080, averaging 49.615. Analogously, the credit-to-deposit ratio varies between 16.830 and 342.440, yielding an average of 94.783. Finally, the liquid assets to deposit ratio (LATDR) ranges from 6.710 to 67.370, with an average of 23.408.

Table 4: Descriptive Statistics

Variables	N	Min.	Max.	Mean	Std. Deviation
Z-score	154	3.420	36.960	17.486	8.176
BCR_3	154	16.14	100.00	50.232	21.243
NIITI	154	12.690	61.890	31.139	10.531
CTI	154	30.320	98.080	49.615	12.353
ROA	154	-1.840	4.540	1.436	1.005
NIM	154	.590	11.030	3.375	1.766
CTDR	154	16.830	342.440	94.783	63.501
LATD	154	6.710	67.370	23.408	13.798

Table 5 reveals the association between response and predictor variables. The matrix serves as a diagnostic tool, in particular a multicollinearity test, for assessing the relationships among predictor variables and the extent of their correlation with each other (Yarso Sarpong & Adu-Asare Idun, 2024). Table 5 demonstrates the direct association between the BCR and the stability measure, the Z-score. This suggests that an increase in the bank concentration ratio results in an increase in bank stability within Asian nations. The study further illustrates that indicators of profitability such as ROA and NIM exhibit negative correlations with bank stability. Moreover, the outcomes indicate an unfavorable association between profitability and BCR, indicating that highly concentrated banks cannot earn more profits by imposing high charges on clients. This finding reveals that heightened profitability by taking more risk contributes to enhanced bank vulnerability in Asian countries. Conversely, the NIITI, which is a metric for income diversification, NIITI, displays a significant favorable correlation with bank stability. Moreover, income diversification has an inverse relationship with key indicators of profitability such as ROA, ROE, and NIM, suggesting that diversified banks generate reduced profits, consequently increasing their vulnerability.

The measure of efficiency, CTI, displays a negative and significant correlation with bank stability. Additionally, the CTI ratio has a negative correlation with the profitability measure ROA but a positive correlation with the NIM. This implies that banks transitioning from conventional loan services to fee and commission-based revenues enhance bank after-tax profit

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and thus decrease banks' vulnerability. The credit-to-deposit ratio positively correlates with profitability, suggesting that heightened lending to borrowers can amplify banks' profits. Conversely, the LADR exhibits a negative link with profitability, suggesting that compared to loan income, liquid assets generate lower returns. Interestingly, the results suggest that heightened liquidity levels constrain banks' lending capacity in Asian nations.

Table 5: Pearson's Correlation Matrix

Variables	Z-score	lnBCR	lnNIITI	lnCTI	lnCTDR	lnLATA	NIM	ROA
Z-score	1							
$lnBCR_3$	.067 (.412)	1						
lnNIITI	.160* (.047)	.061 (.452)	1					
lnCTI	-.227** (.005)	.101 (.212)	.132 (.104)	1				
lnCTDR	.076 (.351)	-.016 (.841)	-446** (.000)	.760** (.000)	1			
lnLATA	.147 (.068)	.332** (.000)	.253** (.002)	.243** (.000)	-306** (.000)	1		
NIM	-.300** (.000)	-.088 (.279)	-.258** (.001)	.229** (.004)	-.171* (.034)	.310** (.000)	1	
ROA	-.098 (.225)	-.331** (.000)	-.065 (.426)	-.505** (.000)	.181* (.025)	.019 (.813)	.423** (.000)	1

Note. ** and * denote that correlation are significant at the 1% and 5% level of significance.

This research examines the impact of profitability, revenue diversification, efficiency, liquidity, and bank rivalry on the stability of banks in Asian countries. The Hausman test results reveal that the RE model outperforms the FE model. In the same vein, the redundant FE tests indicate that the FE model outperforms the POLS model. "The Breusch-Pagan test conclusively showed that the random effects RE model was more appropriate than the POLS model" (Budhathoki et al., 2024, p.106). Thus, this study utilized an RE model to investigate the influence of bank rivalry, profitability, income diversification, efficiency, and liquidity on bank stability.

Table 6 displays the findings of the regression analysis. "The regression model has a reasonable overall explanatory power" (Budhathoki et al., 2024, p.106), as indicated by its R-squared value 0.403. This indicates that the variation in the predictor factors can account for 40.3 "percent of the variation in bank stability. The significance threshold of the F-statistic indicated that this regression model was a good fit" (Budhathoki et al., 2024, p.106). Furthermore, Table 6 presents the impact of many factors, such as the BCR, NIITI, CTI, CTDR, LATD, NIM, and ROA, on the Z-score. The regression coefficient of lnBCR ($\beta = 1.975$, $p < .01$) indicates that

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there is a positive relationship between BCR and bank stability in Asian countries. The regression coefficient of lnNIITI (β = -.080, p < .1) indicates that there is a detrimental effect of bank diversification on bank stability in Asian nations. The regression coefficient of lnCTI (β = -.374, p < .01) indicates that an escalation in the CTI ratio resulted in a decline in bank stability. On the other hand, the regression coefficients of lnCTDR (β =.346, p <.01), lnLATD (β =.087, p <.05), and NIM (β =.036, p <.05) demonstrate a favorable influence on bank stability. The regression coefficient of ROA (β = -.0004, p > .05) indicates that ROA has no significant impact on the stability of banks in Asian countries.

Table 6: Regression Results

Variables	Coefficients	Std. Error	t-Statistics	p-value
Constant	1.975***	.702	2.815	.006
$lnBCR_3$	-.080*	.043	-1.868	.064
lnNIITI	.180**	.071	2.517	.013
lnCTI	-.374***	.123	-3.052	.003
lnCTDR	.346***	.065	5.312	.000
lnLATD	.087**	.041	2.118	.036
NIM	.036**	.017	2.103	.037
ROA	-.0004	.021	-.022	.983
R-squared	.403			
F-statistic	14.051***			.000
Breuch-Pagan test			590.96***	.000
Chow test			486.643***	.000
Hausman test			4.774	.688

Note. ***, **, and * denote that correlations are significant at the 1%, 5%, and 10% level, respectively.

Discussion

The coefficient of lnBCR (β = -.080, p < .01) indicates that a higher BCR leads to greater bank stability in Asian countries. The results of the present study support the CFH but do not provide sufficient evidence to support the CSH. This pattern of results is in agreement with the earlier empirical studies of Yitayaw et al. (2023) and Ferreira et al. (2023). However, these conclusions contradict the findings of Albaity et al. (2019), Islam et al. (2020), and Nguyen et al. (2023). These findings strongly suggest that more competition in the loan and deposit markets leads to lower lending rates and higher deposit interest rates. The decrease in interest income and rise in funding costs diminish banks' profitability, prompting them to seek higher returns by taking on additional risks, consequently amplifying the instability of banks.

The coefficient of lnNIITI (β = .180, p < .01) suggests that a higher level of diversification leads to greater bank stability in Asian countries. This finding is congruent with the earlier conclusions of Shahriar et al. (2023) and (Yarso Sarpong & Adu-Asare Idun, 2024) but

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contradicts the previous empirical results of Liang et al. (2020) and Pham et al. (2021). The most compelling explanation for the present findings is that the diversification of banks from traditional loan businesses to fees and service-based income sectors provides additional revenue sources to banks. In addition, diversified banks attract more customers by providing additional services to clients, which increases banks' profitability and thus enhances bank stability.

The coefficient of lnCIT ($\beta = -.374$, $p < .01$) suggests that a lower CTI leads to more excellent bank stability in Asian countries. The present results are in agreement with those of Diab et al. (2023). However, this finding contradicts the earlier findings of the previous empirical studies of Tran et al. (2022) and Yitayaw et al. (2023). These findings may be explained by the idea that an efficient bank can provide quality service at a reasonable price that attracts more customers, which can help to increase profitability, thus enhancing bank stability. The coefficients of lnCTDR (($\beta = .335$, $p < .01$) and lnLATD ($\beta = .087$, $p < .05$) indicate that higher CTDR and LATD lead to greater stability in Asian countries. This result is coincides with the findings of Dutta and Saha (2021) and Bandyopadhaya and Saxena (2023). In contrast, these findings contradict the empirical findings of Tran et al. (2022) and Ahmad et al. (2022). One interpretation of these findings is that a higher CTDR enhances bank profitability, and a higher liquidity ratio protects banks from liquidity crises, thus enhancing bank stability.
The coefficient of the NIM ($\beta = .036$, $p < .05$) indicates that a higher net interest margin enhances bank stability. This result is in line with the findings of Nguyen and Le (2022), Tran et al. (2022), and Shahriar et al. (2023). However, ROA does not significantly impact bank stability. This finding indicates that profitable banks can manage economic shocks when economic conditions are in a downturn.

Conclusion

This study looks at how bank rivalry, profitability, revenue diversification, efficiency, and liquidity affect bank stability in Asian countries. A RE model is used in this study to examine the cause-and-effect relationship among the dependent, independent and control variables. The regression model, with the Z-score as the dependent variable, is statistically significant ($F = 14.051$, $< .01$), indicating that it is the best fit. This finding demonstrates that increased banking concentration has a negative impact on financial stability in Asian countries. In contrast, higher income diversification positively affects bank stability in Asian countries. Conversely, efficiency (CTI) is negatively related to bank stability and is statistically significant. Similarly, two liquidity measures—the lnCTDR and the lnLATD—positively affect the bank's stability. Finally, the profitability measure NIM positively affects the stability of banks in Asian countries. Policymakers, not investors, are the primary concern of banking sector stability. Hence, these findings can help policymakers such as central banks take effective action to maintain the risk of bank fragility. The study only looks at five predictor variables—bank competitiveness, profitability, diversity, efficiency, and liquidity—to demonstrate the impact

on bank stability. As a result, future studies in the Asian setting should include other variables such as the inflation rate and GDP growth rate.

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