



FACTORS AFFECTING THE FINANCIAL STABILITY OF VIETNAMESE COMMERCIAL BANKS

Nguyen Thi Nhu Quynh^{1*}, Ha My Tam¹

¹Ho Chi Minh University of Banking, Vietnam

*Corresponding author: Email: quynhntn@hub.edu.vn

ARTICLE INFO	ABSTRACT
DOI: 10.52932/jfmr.v4i3en.1074 <i>Received:</i> August 13, 2025 <i>Accepted:</i> March 14, 2026 <i>Published:</i> July 25, 2026 Keywords: Commercial banks, Financial stability, Vietnam Article classification: Research paper JEL codes: G21, G28, E44	Purpose – This paper presents the rationale for analyzing the factors affecting the financial stability of commercial banks in Vietnam. Design/methodology/approach – The study utilizes panel data from 25 Vietnamese commercial banks over the period 2013–2023. The empirical analysis employs Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects Model (FEM), and Random Effects Model (REM). Finally, the Generalized Method of Moments (GMM) is applied to address potential endogeneity problems in the econometric model. Findings – The research results show that bank size and capital adequacy ratio (CAR) have a positive impact on financial stability, implying that large and well-capitalized banks are more stable. In contrast, return on equity (ROE), non-performing loan ratio (NPL), loan-to-deposit ratio (LDR) and non-interest income (NII) all reduce bank stability. Regarding macroeconomic factors, inflation negatively affects bank stability. GDP variable also shows a negative impact, contrary to the initial theoretical expectations, suggesting that economic expansion may encourage excessive credit growth and risk accumulation in the banking sector. Among them, the bad debt ratio has the strongest impact with a statistical significance level of 1% and a regression coefficient of -17.221, reflecting that credit risk is still a major challenge for the Vietnamese banking system in this period. Originality/value – This paper provides updated empirical evidence on banking stability in an emerging market context. It extends prior literature by integrating both bank-specific indicators and macroeconomic factors within a unified analytical framework. Practical implications – The findings offer actionable insights for policymakers and bank managers to formulate strategies aimed at enhancing capital adequacy, controlling credit and liquidity risks, and designing regulatory frameworks that foster sustainable banking stability in Vietnam. Social implications – Strengthening banking sector stability safeguards public savings, reinforces stakeholder trust, mitigates systemic financial contagion, and supports stable, sustainable economic growth.

1. Introduction

In the context of Vietnam's economy increasingly integrating with the region and the world, the banking industry plays a central role in the financial system and a vital position in promoting economic growth and maintaining macroeconomic stability. However, along with the rapid development of the financial market, Vietnamese commercial banks are facing many challenges, including credit risks, liquidity risks, impacts from macroeconomic fluctuations and regulatory policies, as well as increasingly fierce competitive pressure (Nguyen Thi Nhu Quynh, 2020). These factors not only directly affect the operational efficiency of each bank but also affect the stability of the entire banking system.

A stable banking system will minimize the risk of crisis, contribute to maintaining macroeconomic stability, and promote sustainable growth (Crockett, 1997; Goodhart, 2006). Therefore, the State Bank of Vietnam has promoted measures to restructure the credit system, apply international safety standards such as Basel II, and issue regulations to improve the safety and sustainability of the banking system in recent years. However, besides the impact of macroeconomic regulation policies, internal factors of banks such as scale, operating efficiency, capital structure, and asset quality also play an important role in maintaining financial stability (Abuzayed et al., 2018; Jayakumar et al., 2018).

Previously, there have been many domestic and foreign studies analyzing factors affecting the financial stability of commercial banks; however, most international studies focus on developed economies and emerging economies, such as studies by... In addition, some studies stop at considering each group of individual factors such as globalization (Yin, 2019), competitiveness (Vo Xuan Vinh & Dang Buu Kiem, 2016), and foreign ownership (Lee & Hsieh, 2014). For studies in Vietnam, some factors such as non-interest income and diversification have not been analyzed in depth regarding their impact on bank

stability. Therefore, this study was conducted to supplement empirical evidence in the context of Vietnam and, at the same time, build a model combining internal factors and macroeconomic factors to more fully assess the factors affecting bank stability in Vietnam in recent times.

2. Theoretical basis and literature review

2.1. Theoretical basis of banking stability

According to Segoviano and Goodhart (2009), in terms of interdependence, banking stability can be understood as the overall steadiness of banks that are either directly connected through the interbank deposits market and participation in joint loan agreements or indirectly linked by lending to the same sectors or engaging in exclusive transactions. Factors that contribute to banking stability, as well as their impact on the stability of the financial system, may vary from one country to another.

Swamy (2014) defines banking stability as a state in which the financial system can simultaneously fulfill conditions including: effective allocation of resources, assessment and management of financial risks, absorbing ongoing shocks, ensuring payments remain smooth, enhancing equilibrium by managing assets and price fluctuations, and ultimately steering the economy in a direction that is beneficial to economic well-being. The level of stability depends on factors such as asset quality, liquidity, capital adequacy ratio, and profitability.

Djebali and Zaghdoudi (2020) define: "A bank is considered stable if it meets two basic requirements: improving economic performance and eliminating imbalances due to endogenous factors of unforeseen or undesirable events from various banking risks."

Thus, although there are many different definitions of banking stability, in general, it refers to a state in which banks can operate smoothly, effectively perform their intermediary and other functions, and withstand external

shocks. At the same time, stable banks do not generate shocks that negatively affect the economy, thereby contributing positively to the development of the financial system in particular and the national economy in general (Nguyen Thi Nhu Quynh, 2020).

2.2. Literature review

Previous studies mainly focused on four main groups of factors affecting bank stability, including: internal factors of banks, competition, diversification and macroeconomic factors.

For the internal factors group, Nguyen Thi Tuyet Lan (2021) analyzed the impact of profits on the financial stability of Vietnamese commercial banks in the period 2008-2019 with the dependent variable being Z-score; the results showed that the higher the profit, the more stable the bank. Another study conducted by Chai et al. (2022) in Pakistan showed that profitability has a positive impact on bank stability, while credit risk and liquidity risk have a negative impact. On the contrary, according to Chand et al. (2021), bank size and credit risk have a positive impact on bank stability, while liquidity risk and net interest margin factors have a negative impact.

When analyzing the relationship between competition and banking stability, Kočišová (2020) studied 30 global systemically important banks (G-SIBs) in Europe, showing that high competition does not cause instability, but can also contribute to improving efficiency and resilience if well controlled. Agreeing with the above view, the research results of Vo Xuan Vinh and Dang Buu Kiem (2016) show that banks with high competitive advantages often have better stability, especially in imperfect market conditions like in Vietnam. On the contrary, when analyzing the relationship between competition, efficiency, and financial stability of four East Asian countries in the period 2004-2014, Phan et al. (2019) said that an increase in competition may result in a decrease in stability.

Besides the competition factor, according to Pham Thi Kim Anh et al. (2021), income diversification also affects bank stability. The study uses data from 32 Vietnamese commercial banks during the period 2008-2019. The results show that non-interest income has a positive impact on profitability, but the level of stability can decrease if risks are not well controlled. When examining the impact of diversification on financial stability in the GCC countries, Abuzayed et al. (2018) pointed out that the relationship between non-interest income and stability is nonlinear, suggesting that banks can reduce risks at higher levels of diversification. In addition, many authors have also considered macroeconomic factors such as economic growth and inflation when analyzing bank stability. Ghenimi et al. (2017) examined the determinants of bank financial stability with the dependent variable Z-score. The regression results emphasize the positive and statistically significant relationship between GDP and the financial stability of UK banks. Similarly, in the study on the impact of bank profits on financial stability in Vietnam, Nguyen Thi Tuyet Lan (2021) argued that economic growth has a positive impact on financial stability, while inflation has an opposite impact.

Thus, the studies have the same topic of banking stability, but the research results are not consistent in determining the factors affecting banking stability as well as the direction and level of their impact. The reason is that the studies were conducted in different spatial and temporal scopes, using different research methods. Moreover, the studies using data up to 2023 are limited, so the results will no longer be consistent with the performance of commercial banks in recent years. Therefore, the author conducts the paper to identify factors affecting the stability of banks in order to help managers build appropriate roadmaps to enhance bank stability.

2.3. Develop research hypotheses

Bank size

Large total bank assets mean the bank has abundant sources of customer deposit mobilization and good liquidity, thereby helping the bank's financial stability increase (Nguyen Minh Ha & Nguyen Ba Huong, 2016). Another study conducted by Louzis et al. (2012) points out that scale and high market share allow commercial banks to diversify their credit activities, thereby minimizing the risk of credit concentration. Hence, the paper expects the relationship between size and bank stability to be in the positive direction.

Hypothesis H1: Bank size (SIZE) has a positive relationship with banking stability.

Return on equity

ROE is an important financial indicator that measures a bank's profitability based on equity. A study conducted by Chand et al. (2021) points out that higher return on equity indicates that banks have good profitability, thereby increasing their stability and resilience to financial shocks. In addition, banks with high profits will have an advantage in terms of reliability in credit operations, which is why banking stability is increasing day by day (Ghenimi et al., 2017). From the above research results, the author expects the relationship between return on equity and banking stability to be in the positive direction.

Hypothesis H2: Profitability (ROE) has a positive relationship with banking stability.

Non-performing loan

The ratio of bad debt to total outstanding loans is one of the important indicators showing a bank's credit risk. This indicator is always of special interest to operational administrators and policymakers. Increased credit risk causes the condition of bank loans to deteriorate, become unrecoverable, and reduce credit quality, thereby affecting the ability to meet payables because the bank has not yet recovered loan capital and will subsequently

affect the bank's ability to maintain operations. In other words, higher levels of credit risk are associated with a greater probability of bank failure. Specifically, when credit risk increases, bank stability will decrease (Ghenimi et al., 2017; Imbierowicz & Rauch, 2014). Therefore, the bad debt ratio has a negative impact on banking stability.

Hypothesis H3: Bad debt ratio (NPL) has a negative relationship with banking stability.

Capital adequacy ratio

Capital adequacy ratio is an indicator that reflects the relationship between equity capital and risk-adjusted assets of a bank. This indicator indicates the level of equity capital that can offset risks and reduce the risk of bank insolvency during operations (Yen & Ngan, 2016). According to de Moraes and de Mendonça (2019), banks with a high capital adequacy ratio will create a cushion against financial shocks, capable of ensuring operational safety as well as protecting depositors, thereby reducing the risk of bankruptcy for banks. The results of the study by Ghenimi et al. (2017) also show that CAR has a positive impact on banking stability.

Hypothesis H4: Capital adequacy ratio (CAR) has a positive relationship with banking stability.

Loan to deposit ratio

LDR is an important indicator in the banking industry, indicating the relationship between total loans and total deposits of a bank. Nguyen Thi Nhu Quynh (2020) explained: "If this ratio is too high, it means commercial banks are using most of their deposits to lend. On the one hand, this helps commercial banks increase profits. On the other hand, commercial banks also face liquidity risks and a lack of capital to fulfill the bank's due obligations such as returning deposits. Savings withdrawn before maturity or credits committed to disbursement in the future can lead to banking instability. However, this does not mean that banks should maintain the loan-to-deposit ratio at too low a level. A level that is too low means that the bank is operating inefficiently and is not taking full advantage of

the bank's resources to carry out credit activities – an activity that accounts for a large proportion of the bank's total income – leading to the bank not being able to achieve profits at the expected level. In summary, although a high LDR ratio can increase profitability, it can also increase liquidity and bad debt risks if not managed carefully. In this thesis, the author expects the relationship between loan-to-deposit ratio and banking stability to be negative.

Hypothesis H5: Loan-to-deposit ratio (LDR) has a negative relationship with banking stability.

Non-interest income

A bank's income primarily comes from two sources: interest income and non-interest income. Interest income accounts for a large proportion of total income and mainly comes from lending activities (Pham Thi Kim Anh et al., 2021). The ratio of non-interest income to total income includes net income from service activities, business and investment activities, and other non-interest activities (Hoang Ngoc Tien & Vo Thi Hien, 2010). According to Modern Portfolio Theory proposed by Harry Markowitz, investors can reduce the overall risk of their portfolio by combining assets whose returns are not perfectly correlated. Diversification helps investors achieve an optimal balance between expected returns and risk. Applying this theory to the banking industry, increasing non-interest income allows banks to diversify their revenue sources, reduce their dependence on lending activities, and minimize the risks associated with fluctuations in the credit market. Empirical studies by Tariq et al. (2021), Nguyen Minh Sang et al. (2018), and Oniang'o (2015) also showed that non-interest income has a positive impact on bank stability. Therefore, this thesis expects a positive relationship between non-interest income and bank stability.

Hypothesis H6: Non-interest income (NII) has a positive relationship with banking stability.

Inflation

Inflation is the phenomenon of increasing the general price level of goods and services in the economy in a certain period of time, meaning that the same amount of money can only buy fewer goods and services than before. When inflation increases, consumers reduce their real income and reduce their spending needs, causing business goods to stagnate, leading to lower profits than expected, and even losses can occur. The ability of businesses to repay debt, thereby leading to increased bank bad debt, increased risk of bank bankruptcy, and increased bank instability. Previous empirical studies also suggested that the inflation rate has a negative impact on bank stability, such as research by Abuzayed et al. (2018), Chen et al. (2017), Diaconu and Oanea (2014).

Hypothesis H7: Inflation has a negative relationship with banking stability.

Economic growth

According to Abuzayed et al. (2018), banks are expected to operate stably in more developed economies. There have been many studies that suggest that GDP growth has a positive impact on banking stability, because when GDP increases, it means the economy is growing well. At that time, the income of individuals and households increases; on the one hand, it will cause them to consume more, creating conditions for businesses to operate effectively and increase profits so that these businesses can pay off debts easily. On the other hand, when individual and household income increases, it will boost the ability of these subjects to repay loans. As a result, the bank will enjoy the above benefits so that it can operate stably. Some previous empirical studies have shown that GDP economic growth has a positive relationship with banking stability, such as the research of Abuzayed et al. (2018), Chen et al. (2017), Diaconu and Oanea (2014), and Ngambou Djatche (2019).

Hypothesis H8: GDP has a positive relationship with banking stability.

3. Research methodology, model and data

3.1. Research methodology

The paper uses regression methods for panel data, including the Pooled OLS model, the FEM fixed-effect model, and the REM random-effect model. To select the appropriate model, the study conducts the F-test and the Hausman test. In addition, the study also conducts heteroscedasticity and autocorrelation tests and finds endogenous variables in the model through the Durbin-Wu-Hausman test. If the model has one of these defects, the author uses the generalized method of moments (GMM) to overcome it (Al-Khouri & Arouri, 2016; Ghenimi et al., 2017).

3.2. Research model

General research model

Based on the studies of Ghenimi et al. (2017), Le Ngoc Quynh Anh et al. (2020), Ozili (2018), the author proposes a research model with the dependent variable lnZ-score representing banking stability. The reason that the thesis uses lnZ-score instead of Z-score is because the Z-score coefficient of banks over the years has significant differences (Nguyen Thi Nhu Quynh, 2020).

The research model has the following form:

$$\begin{aligned} \text{Stability}_{it} = & \alpha_0 + \alpha_1 \text{SIZE}_{it} + \alpha_2 \text{ROE}_{it} \\ & + \alpha_3 \text{NPL}_{it} + \alpha_4 \text{CAR}_{it} + \alpha_5 \text{LDR}_{it} + \alpha_6 \text{NII}_t \\ & + \alpha_7 \text{INF}_t + \alpha_8 \text{GDP}_{it} + \varepsilon_{it} \end{aligned} \quad (3.1)$$

In which:

Stability: Banking stability, measured by lnZ-score

SIZE: Bank size

ROE: Ratio of profit after tax on equity

NPL: Non-performing loan

CAR: Capital adequacy ratio

LDR: Loan to deposit ratio

NII: Ratio of non-interest income to total income

INF: Inflation rate

GDP: Economic growth rate

it: Bank i in year t

ε : Residual of the model

Explain variables in the research model

In the research model, the dependent variable is lnZ-score, which represents the financial stability of commercial banks. This variable is calculated by the natural logarithm of the Z-score index, a popular index in banking finance research used to measure the level of bankruptcy risk. Z-score reflects the gap between income and the bankruptcy threshold, so the higher the Z-score value, the more stable the bank is (Laeven & Levine, 2009).

The formula for calculating the Z-score index is as follows:

$$\text{Z-score} = \frac{\text{ROA} + \frac{E}{A}}{\sigma(\text{ROA})} \quad (3.2)$$

In which:

ROA: Return on total assets

E/A: Equity ratio to total assets

$\sigma(\text{ROA})$: Standard deviation of ROA

Based on previous studies and practices in Vietnam on the relationship between factors affecting financial stability of commercial banks (see Appendix 1 online).

3.3. Research data

To analyze the factors affecting the financial stability of Vietnamese commercial banks, the study collected data from 25 commercial banks listed on the Vietnamese stock market during the period 2013-2023. In particular, the data for the study were collected from annual reports and resolutions of the general meeting of shareholders of commercial banks. Some market data on capitalization value was collected from the Fiinpro data system.

4. Analysis research results

Descriptive statistical results are presented in Appendix 2 (see Appendix 2 online) shows that the sample of 25 commercial banks in the period 2013-2023 displays considerable variation across key financial indicators. Bank stability, measured by the lnZ-score, averages 4.0139,

ranging from a high of 8.9899 (BAB, 2018) to a low of 1.1593 (TPB, 2013), while bank size averages 18.8085, spanning from 16.5023 up to 21.4326 (CTG, 2023). Profitability is reflected in an average ROE of 10.90% (SD = 7.88%), and asset quality is generally sound, with an average bad debt ratio of 2.17%, comfortably below the 3% threshold set by Circular 22/2019/TT-NHNN, though NVB stood out sharply in 2023 with a ratio of 29.76%. Capital adequacy also appears solid on average, at 12.72% against the State Bank's 9% minimum, with OCB reaching as high as 27.98% in 2014. Liquidity and income structure likewise vary widely: the loan-to-deposit ratio averages 89.88% (from 37.19% up to 146.91% for VPB in 2021), and the non-interest income-to-total income ratio averages 22.71% (from 2.55% up to as much as 232.97% for BVB in 2013). By contrast, the macroeconomic environment remained relatively stable over the period, with inflation and GDP growth showing low standard deviations of 1.40% and 1.64%, respectively.

The results (*see Appendix 3 online*) show that all correlation coefficients between pairs

of variables are lower than 0.8. This explains that the independent variables in the model are poorly correlated with each other. The author examined the variance inflation factor in the model; the results (*see Appendix 4 online*) show that all VIF values of the independent variables are less than 10, and the average value of VIF is 1.40. Therefore, it can be concluded that the model does not have serious multicollinearity, and the study continues to perform the next regression steps.

The author conducts the Durbin-Wu-Hausman test to check whether the model has endogenous variables. The results in Table 6 show that the NPL variable has a p-value less than 0.05 in both the Durbin and Wu-Hausman tests, so it can be confirmed that the NPL variable is endogenous. For the INF variable, the p-values are 0.0455 and 0.0501, respectively, which are close to the 5% significance level, indicating that the INF variable has signs of endogeneity (*see Appendix 5 online*). From this result, the study uses the GMM estimation method to overcome the endogeneity and heteroscedasticity phenomena.

Table 1. Results of using the GMM method

Variables	Coefficient	Std. err.
LnZ-score (t-1)	0.578***	0.0990
SIZE	0.110**	0.0529
ROE	-2.342**	0.9217
NPL	-17.221***	1.7873
CAR	4.039***	1.1310
LDR	-0.862**	0.3416
NII	-0.150*	0.2800
INF	-8.506*	4.4244
GDP	-3.675*	2.0298
_cons	1.012	1.1797
AR(1) p-value	0.017	
AR(2) p-value	0.193	
Hansen test	0.885	
Number of groups	25	
Number of instruments	18	
Prob > F	0.000	

Note: Symbols *, **, ***: coefficients are statistically significant at the 10%, 5% and 1% significance levels, respectively.

Table 1 presents the estimation results using the GMM method. The dependent variable representing bank stability is LnZscore. The results show that the GMM method is reliable when it meets all 4 conditions, including: $AR(1) = 0.017 < 10\%$ so reject the hypothesis H_0 : there is no first-order serial correlation; $AR(2) = 0.193 > 10\%$ so accept the hypothesis H_0 : there is no second-order serial correlation in the error of the regression model; Hansen test with $Prob > \chi^2 = 0.885 > 10\%$ so accept the hypothesis H_0 : the instrumental variables are valid; and the number of instrumental variables is 18 smaller than the number of groups is 25. Therefore, the above model is suitable. The research results show that:

Firstly, the regression coefficient of the variable LnZ-score (t-1) is positive and statistically significant at the 1% level, indicating that the LnZ-score of the following year is positively correlated with the LnZ-score of the previous year, demonstrating a positive relationship between banking stability this year and the previous year. According to Pham et al. (2021), the bad debt ratio of Vietnamese commercial banks once increased to 17.2%, while the bad debt ratio considered safe in the whole system should only be below 2%. In fact, Vietnam's banking sector has had considerable challenges in managing collateral and collecting bad debts between 2012 and 2015. As a result, the stability of the banks this year may have an impact on these issues in the upcoming year.

Secondly, bank size has a positive impact on the dependent variable LnZ -score with a statistical significance level of 5% and a regression coefficient of 0.110, indicating a positive relationship between size and the stability of banking regulations. This result is consistent with the study of Le Ngoc Quynh Anh et al. (2020), which argues that as bank size increases, the level of financial stability of the bank also increases. Since larger banks often have more diverse portfolios and customers, this helps to spread risks and reduce the impact of bank-specific risks. Another study conducted by

Nguyen Thi Nhu Quynh (2020) said that large-scale banks often have prestige and reputation in the market, so they pay great attention to risk management. This means that bad debts at these banks are often low, which further increases the stability of the bank. Therefore, the author accepts the hypothesis "Bank size has a positive relationship with bank stability".

Thirdly, return on equity ROE has a negative impact on lnZ-score at the 5% significance level, and the regression coefficient is -2.342. This result is consistent with the study of Demirgüç-Kunt and Huizinga (2010), which indicates a negative relationship between return on equity and bank stability. In practice, during the period 2020-2022, the Vietnamese banking sector recorded relatively high profitability despite the economy being affected by the COVID-19 pandemic. Many commercial banks maintained ROE levels above 15% and even exceeded 20%. According to data from the State Bank of Vietnam, the average ROE of the entire credit institution system reached approximately 10.9% in 2021 and increased to about 15.8% in 2022. Several large banks such as Vietcombank, Military Bank (MB Bank), and Asia Commercial Bank (ACB) recorded ROE levels above 20-25% in 2022, reflecting the strong profitability of the banking system during this period. However, high profitability is often associated with strategies such as credit expansion, increased financial leverage, or a greater willingness to undertake higher levels of risk in order to maximize profits. This may lead to an increase in credit risk and systemic risk in the long run. Therefore, a high ROE reflects the profitability of a bank, but in some cases, it may also be accompanied by a higher level of risk tolerance, which can undermine the bank's financial stability. Thus, the hypothesis that "ROE has a positive impact on bank stability" is rejected.

Fourthly, the NPL ratio has a negative impact on the dependent variable lnZ-score with a statistical significance level of 1% and a regression coefficient of -17.221. This result

is similar to the author's initial expectation and is supported by the research of Chai et al. (2022) and Ghenimi et al. (2017). When NPL increases, financial stability decreases, which is understandable. Banks with increased NPL lead to increased credit risk; banks are at risk of not being able to recover their initial loans, leading to loss of liquidity, thereby making banks less stable. Moreover, increased NPL causes banks to increase the cost of risk provisioning for these items, increasing the bank's costs, causing the bank's profits to decrease, leading to financial instability of the bank. Therefore, the paper accepts the hypothesis that "NPL has a negative relationship with bank stability".

Fifthly, the minimum capital adequacy ratio CAR has a positive impact on the dependent variable lnZ-score with a statistical significance level of 1% and a regression coefficient of 4.039. This result is consistent with the author's initial expectation and is supported by the view of Li and Malone (2016) that well-capitalized banks are considered more stable because they have available capital reserves to absorb losses from bad debts or other financial shocks. Another study conducted by Nguyen Thi Nhu Quynh (2020) also indicates that a high CAR ratio demonstrates that commercial banks have sufficient equity capital to cover risky activities, which serves as a cushion to help commercial banks avoid risks during their operations. Therefore, the paper accepts the hypothesis that "CAR has a positive relationship with bank stability".

Sixthly, loan-to-deposit ratio LDR has a negative impact on the dependent variable lnZ-score with a statistical significance level of 5% and a regression coefficient of -0.862. This result is consistent with the author's initial expectation and is supported by the studies of Nguyen Duc Trung and Nguyen Hoang Chung (2018), Yen and Ngan (2016). When the total outstanding loans of a bank are too large, the bank will not have much cash reserves to deal with customers' sudden withdrawal needs, leading to liquidity risk. In addition to liquidity risk, high LDR is often

accompanied by banks issuing more loans, meaning the bank's credit risk level is higher. If credit quality decreases, the bad debt ratio will increase, negatively affecting the bank's financial health. This negative impact has also been verified by Nguyen et al. (2017). Therefore, the paper accepts the hypothesis that "LDR has a negative relationship with bank stability".

Seventhly, the ratio of non-interest income to total income NII has a negative impact on the dependent variable lnZ-score with a statistical significance level of 10% and a regression coefficient of -0.150. This result is contrary to the author's initial expectation but is consistent with the research results of Brunnermeier et al. (2009), who argued that expanding non-interest activities to generate income can increase systemic risk if not carefully managed. In addition, activities that generate non-interest income such as securities trading, investment banking services, service fees, etc. are often higher risk than traditional activities such as lending and receiving deposits. These activities are easily affected by market fluctuations, leading to income fluctuations, thereby reducing the stability of the bank (Stiroh, 2004). From these results, the hypothesis that "NII has a positive relationship with bank stability" is rejected.

Eighthly, inflation has a negative impact on the dependent variable lnZ-score with a statistical significance level of 10% and a regression coefficient of -8.506. This result is consistent with the study of Nguyen Thi Tuyet Lan (2021). High inflation reduces the real value of bank deposits and assets. This can lead to a decrease in customers' confidence in the banking system, causing them to withdraw money or switch to other forms of investment. Besides, high inflation often leads to higher interest rates, increasing customers' borrowing costs. This can reduce customers' ability to repay debts, leading to an increase in the bad debt ratio. Therefore, the hypothesis that "INF has a negative relationship with bank stability" is accepted in this thesis.

Lastly, GDP has a negative impact on the dependent variable lnZ-score with a statistical significance level of 10% and a regression coefficient of -3.675. This research result is contrary to the author's initial hypothesis and previous studies by Abuzayed et al. (2018), Chen et al. (2017), and Rashid et al. (2017). However, the study by Dell'Ariccia et al. (2016) shows that economic growth has a negative impact on bank stability. During periods of strong economic growth, credit demand tends to increase significantly, encouraging banks to expand lending activities to maximize profits. Under such favorable economic conditions, banks may loosen lending standards, increase leverage, or allocate more credit to riskier sectors such as real estate and speculative investments. As a result, rapid credit expansion during economic booms can lead to the accumulation of credit risk and a deterioration in asset quality over time. When the economic cycle reverses, these accumulated risks can materialize as higher non-performing loans and financial instability. Therefore, the negative relationship between GDP and bank stability in this study may reflect the pro-cyclical behavior of the Vietnamese banking system, where periods of economic expansion are often accompanied by strong credit growth and increased risk. Thus, the study rejects the hypothesis of a positive impact of GDP on bank stability.

5. Conclusion and policy implications

5.1. Conclusion

The research results show that bank size (SIZE) and Capital adequacy ratio (CAR) and that impact in the positive direction on the financial stability of Vietnamese commercial banks and factors such as Return on equity (ROE), Non-performing loan (NPL), Loan to deposit ratio (LDR), Non-interest income (NII), Inflation (INF) and Economic growth rate (GDP) have negative effects. In addition, the study also shows that the stability of the banks this year may have an impact on these issues in the upcoming year.

This study makes several contributions in both theoretical and practical aspects. From a theoretical perspective, it enriches the existing literature on banking stability by providing empirical market such as Vietnam. From a practical perspective, this study provides policymakers with insights that can support the design of effective regulatory frameworks and oversight policies aimed at improving the financial stability of Vietnamese commercial banks in the coming time.

5.2. Policy implications

Based on the research results, the paper proposes some policy implications to improve banking stability for the Vietnamese commercial banking system as follows:

For commercial banks, the research results show that bank size has a positive impact on bank stability. Therefore, banks need to proactively enhance financial stability through reasonable scale expansion, accompanied by increased charter capital, the development of operating networks, and the application of modern technology. However, the expansion process needs to be strictly controlled, ensuring that governance and risk management capacity are improved accordingly. At the same time, banks need to balance profit targets and financial safety, avoiding the trend of chasing short-term profits through massive credit or risky investments. Strengthening risk management and internal control is a key factor in maintaining long-term operational efficiency. In addition to controlling the bad debt ratio, banks need to improve credit quality through careful customer appraisal, monitoring capital usage, making adequate risk provisions, regularly reviewing credit portfolios, and proactively applying effective debt collection measures.

At the same time, ensuring the capital adequacy ratio (CAR) at an appropriate level is a necessary condition to increase risk tolerance, through increasing equity from retained earnings or issuing additional shares. Banks

also need to closely monitor risks that may affect capital to proactively make timely adjustments. The loan-to-deposit ratio (LDR) needs to be controlled at a reasonable level in order to balance mobilized capital and credit, avoiding liquidity imbalance. In addition, non-interest income needs to be developed cautiously, focusing on stable, transparent sources of income, not dependent on risky investments, while maintaining the income base from traditional credit activities as an important pillar for safe and effective development.

For State agencies, particularly the State Bank of Vietnam as the central supervisory authority, policies should aim to encourage commercial banks to expand their scale in a prudent manner. The Government and the State Bank need to create favorable institutional conditions and regulatory frameworks, while strengthening supervision to control risks arising from large-scale banks, thereby avoiding the “too big to fail” problem that may threaten systemic stability. Regarding the high bad debt ratio in some banks, regulatory authorities should further improve the legal framework for the management and resolution of non-performing loans, particularly regulations related to collateral disposal and debt recovery. In addition, supervisory authorities should closely monitor key prudential indicators such as the capital adequacy ratio (CAR) and the loan-to-deposit ratio (LDR), while developing effective early warning mechanisms and timely intervention measures when potential risks emerge.

More importantly, the negative relationship between GDP and bank stability provides an important policy implication for financial regulators. This finding suggests that periods of strong economic expansion may be accompanied by excessive credit growth and increased risk-taking by banks. Therefore, regulatory authorities such as the State Bank of Vietnam should strengthen credit supervision and implement appropriate macroprudential measures during economic booms. In particular, policies aimed at controlling excessive credit

expansion and tightening lending standards in overheated periods are essential to prevent the accumulation of systemic risks. Such measures can help restrain excessive market optimism and ensure that credit growth remains aligned with the fundamentals of the economy. By doing so, the banking system can avoid the build-up of vulnerabilities that may threaten financial stability when the economic cycle reverses.

5.3. Limitations and future research direction

Although the thesis has made certain contributions both practically and theoretically, there are still some limitations as follows:

The data used in the study only access 25 commercial banks and cannot access all commercial banks in Vietnam. The author excluded certain banks from the study due to insufficient data available during the research period. Future studies can increase the sample size by increasing the number of commercial banks when these banks have fully published data.

Due to limitations in time and resources, in addition to the factors that affect the financial stability of commercial banks mentioned in the thesis, other factors also have a significant impact, such as foreign investment, loan risk provisions, and competitiveness. Therefore, future studies can consider studying the impact of these factors on the financial stability of Vietnamese commercial banks.

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Data Availability

The datasets analyzed during the current study are available from the corresponding author upon reasonable request

AI Usage Statement

During manuscript preparation, the authors used ChatGPT / Claude / Gemini for language editing, grammar correction, and structural support. The authors reviewed, edited, and took full responsibility for the final content.

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