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Bank competition and financial stability: Does the relationship change during crisis periods? Evidence from Vietnamese commercial banks

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ABSTRACT

This study investigates whether bank competition has different effects on financial stability during crisis periods in the Vietnamese banking sector. Using panel data from 17 Vietnamese commercial banks over the period 2015–2023, the study applies the System Generalized Method of Moments (SGMM) to address endogeneity and dynamic effects. Competition is measured using the Lerner Index, while financial stability is measured using the Z-score. The results show that bank competition negatively affects financial stability, supporting the competition–fragility hypothesis. However, during the COVID-19 period, the interaction term indicates that competition positively contributes to financial stability, suggesting that its effect depends on macroeconomic conditions. The persistence of bank stability over time is also confirmed, supporting the use of a dynamic panel specification. This study provides evidence from a transition economy, highlights the conditional nature of the competition–stability relationship during a health and economic crisis, explains how institutional interventions can reshape competitive dynamics and financial stability in the banking sector, and uses a dynamic specification to capture the lagged effects of competition and stability. The findings also offer implications for policymakers and bank management.

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1. Introduction

The banking sector plays a crucial role in resource allocation and economic growth, but it can also transmit instability across the economy through interbank market disruptions, payment failures, and credit contraction. As Vietnam's banking system deepens its integration into the global economy following COVID-19, understanding how bank competition affects financial stability becomes increasingly important for both efficiency and prudential objectives.

The competition - stability relationship has been continuously debated. The competition - fragility view (Keeley, 1990) holds that competition decreases franchise value and encourages risk-taking, a result confirmed in several markets (Berger et al., 2009; Chinoda and Kapingura, 2023; Risfandy et al., 2022), including Vietnam (Tran and Nguyen, 2025). The opposing competition - stability view (Boyd and De Nicoló, 2005) argues that increased competition forces banks to offer lower loan rates, thereby reducing the probability of borrower default and enhancing stability, a finding supported by Dutta and Saha (2021), Fiordelisi and Mare (2014), and Fu et al. (2014), and by Vietnamese evidence in Dang et al. (2025), Nguyen et al. (2024), and Thanh Le et al. (2024).

Most of this literature focuses on the 2008 global financial crisis, while studies on COVID-19 remain limited. The study analyzes COVID-19 because the 2008 financial crisis originated inside the financial system through mispriced credit risk, while COVID-19 was an external health shock transmitted through household and firm income losses, met by supportive rather than restrictive regulation, such as Circular No. 01/2020/TT-NHNN. Because the transmission channel differs, COVID-19 presents separate empirical treatment rather than a generic crisis dummy.

This study therefore examines whether the competition - stability relationship in the Vietnamese banking sector changes during the COVID-19 period, using a panel of 17 listed commercial banks (HOSE and HNX) over 2015-2023 and a two-step system GMM model in which

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competition is measured by the Lerner Index, stability by the Z-score, and a Lerner×COVID19 interaction term captures the crisis-period shift.

While Vietnamese studies have examined this relationship, international studies have separately addressed crisis effects (Fu et al., 2014) and dynamic specifications (Fiordelisi and Mare, 2014). This study aims to combine both within a single Vietnamese application and test whether the relationship is conditional on COVID-19 through an interaction term, linking the estimated effect to specific SBV interventions and using a dynamic two-step GMM specification.

2. Literature review and hypotheses

2.1. Impact of bank competition on bank stability

The competition–fragility theory, introduced by Keeley (1990), suggests that increased competition reduces banks' franchise value, which represents the present value of future profits, thereby weakening their incentive to behave prudently.

When competition reduces profitability, banks may take on riskier assets to protect returns, and the presence of deposit insurance further encourages this behavior by shifting losses onto the public sector. As a result, higher competition can lead to a higher probability of bank instability. This argument is also supported by Allen and Gale (2004), showing that in highly competitive markets, banks have fewer incentives to support each other and are likely to increase the likelihood of systemic risk. Empirical evidence also supports this view. Berger et al. (2009) found that stronger competition is associated with higher risk-taking, and similar results appear in other emerging markets (Chinoda and Kapingura, 2023; Risfandy et al., 2022) as well as in Vietnam (Tran and Nguyen, 2025).

On the other hand, the competition - stability hypothesis, suggested by Boyd and De Nicoló (2005), holds that market power allows banks to charge higher loan rates, which raises borrower default risk; greater competition, by contrast, lowers rates and improves loan quality. This view is supported by evidence from Asian markets (Fu et al., 2014), European cooperative banks (Fiordelisi and Mare, 2014), and Bangladesh (Dutta and Saha, 2021), as well as by recent Vietnamese studies (Dang et al., 2025; Nguyen et al., 2024; Thanh Le et al., 2024).

Given these mixed findings, the relationship between bank competition and financial stability is likely to depend on market structure and prevailing macroeconomic conditions rather than following a consistent pattern across different banking systems and periods. In particular, the effects of competition may vary depending on banks' market power, risk-taking incentives, and the broader economic environment. Based on the competition–fragility perspective, which appears more consistent with the structure of Vietnam's banking sector, this study proposes the following hypothesis:

H1: Bank competition has a significant effect on bank financial stability in the Vietnamese banking sector.

2.2. Dynamic effect of competition

Several studies suggest that the impact of bank competition on stability may not occur immediately but persist over time. Banks typically do not adjust their risk-taking behavior immediately in response to changes in competition; instead, this adjustment occurs gradually as strategies evolve over time (Arellano and Bond, 1991).

In this study, the lagged value of the competition variable is included to capture the dynamic effect. Because the sample size is relatively small, only one lag is considered. Therefore, the following hypothesis is proposed:

H2: Bank competition has a persistent effect on bank stability over time.

2.3. Competition and stability during crisis periods

Most existing studies examine the competition–stability relationship under normal conditions or around the 2008 global financial crisis, leaving limited evidence on more recent shocks such as COVID-19. During crises, banks often adjust their behavior in response to increased uncertainty and regulatory intervention. For example, banks may adopt more conservative strategies, reduce risky lending, or follow government policies aimed at supporting the economy. In Vietnam, the State Bank introduced several such measures during COVID-19, including interest rate reductions and credit support programs, which may have altered how competition affects bank stability during this period.

Because these conditions differ from normal periods, the competition-stability relationship may not remain constant across time. This study therefore proposes:

H3: The impact of bank competition on bank stability differs during crisis periods.

3. Research methodology

3.1. Data collection

This study uses secondary data collected from 17 commercial banks in Vietnam that are listed on the stock exchanges (HOSE and HNX) over the period from 2015 to 2023, forming a balanced panel dataset with a total of 153 observations. Policy banks, development banks, joint venture banks, and foreign banks are excluded to ensure consistency in the sample.

The data are mainly obtained from the DataStream database. In cases where data is not available, additional information is collected from

the annual consolidated financial statements published on the official websites of the banks. Macroeconomic variables such as inflation and GDP growth are collected from the World Bank database (worldbank.org).

3.2. Variables

The variables used in this study are categorized into three groups: dependent variable, independent variables, and control variables. Dependent variable: The dependent variable is bank stability, measured using the Z-score, which reflects a bank's distance to default. The Z-score formula is as follows:

$$Zscore_{it} = \frac{ROA_{it} + (\frac{Equity}{Total\ Asset})_{it}}{\sigma ROA_{it}} \quad (1)$$

Independent variable: The Lerner index is widely known as a measure of market power, an inverse measure of competition, in which an increase in the Lerner Index will lead to less competition in the banking sector. The Lerner index is determined by the following formula:

$$Lerner_{it} = \frac{Price_{it} - Marginal\ Cost_{it}}{Price_{it}} \quad (2)$$

The marginal cost (MC) is derived from the following translog cost function:

$$\ln Cost_{it} = \beta_0 + \beta_1 \ln Q_{it} + \frac{\beta_2}{2} \ln Q_{it}^2 + \sum_{k=1}^{3} \gamma_{kt} \ln W_{k,it} + \sum_{k=1}^{3} \varphi_k \ln Q_{it} \ln W_{k,it} + \sum_{k=1}^{3} \sum_{j=1}^{3} \ln W_{k,it} \ln W_{j,it} + \varepsilon_{it} \quad (3)$$

where, Q_{it} represents a proxy for bank output or total assets for bank i at time t. $W_{k,it}$ are three input prices. $W_{1,it}$, $W_{2,it}$, and $W_{3,it}$ indicate the input prices of labor, funds, and fixed capital, respectively

Marginal cost is then computed as follows:

$$MC_{it} = \frac{Cost_{it}}{Q_{it}} \left[\beta_1 + \beta_2 \ln Q_{it} + \sum_{k=1}^{3} \varphi_k \ln W_{k,it}\right] \quad (4)$$

The Lerner Index is used because it is the only competition measure that is computed at the bank level and does not require the banking system to be in long-run equilibrium (Schaeck and Cihák, 2014), making it well suited to a transition economy such as Vietnam.

To verify the regularity conditions, the study tests linear homogeneity of degree one in input prices on the translog specification underlying the Lerner Index. An F-test of the homogeneity restriction ($g_1 + g_2 + g_3 = 1$) yields p = 0.3809, indicating that the unrestricted cost function satisfies linear homogeneity.

The study additionally examines the monotonicity condition, which requires estimated cost shares to be non-negative at every observation. The estimated cost share for labor is positive across the entire sample (100%), while the shares for funds and fixed capital are positive for 75.2% and 60.8% of observations, respectively. These violations are observed across banks of varying sizes and are distributed across multiple years rather than concentrated in the COVID-19 period. This finding is consistent with a broader pattern noted in the cost-function literature, where monotonicity violations are common in translog specifications, particularly with correlated input price measures (Coelli et al., 2005). Given that homogeneity holds but monotonicity is violated for a meaningful share of the sample, the study retains the original Lerner Index as the primary competition measure throughout the paper and addresses this limitation in the following section.

Control variables: The model includes bank-level and macroeconomic control variables commonly used in this literature (Berger et al., 2009; Fiordelisi and Mare, 2014; Risfandy et al., 2022). Bank size (log of total assets) is expected to relate positively to stability, as larger banks tend to gain more trust from customers, and their size serves as evidence of their stable and growing operations. Capitalization (equity/total assets) serves as a buffer against unexpected losses, though higher capital may also reflect risk aversion that constrains profitable lending; therefore, its expected sign is left to be determined by the data in this study. Inflation is expected to reduce stability by raising debt burdens, while GDP growth is expected to support it by improving the broader operating environment. These variables control for the broader economic context, including general development, macroeconomic stability, and institutional quality, which are all likely to impact the performance of a country's banking system. Specifically, the COVID-19 dummy (1 for 2020–2021, 0 otherwise) is expected to reduce stability, as it has severely affected the world economy, causing many banks and businesses to suffer negatively; and its interaction with the Lerner Index tests whether the competition–stability relationship shifts during the crisis.

3.3. Model equation

To investigate the relationship between bank competition and bank stability, the following equation is constructed.

$$Stability_{it} = (Stability_{it-1}, Competition_{it}, Competition_{it-1}, Control\ Variables_{it})$$

where, *it* denotes bank *i* in year *t*.

The detailed model is proposed as follows:

$$Zscore_{it} = \alpha_{it} + \delta Zscore_{it-1} + \beta_1 Lerner_{it} + \beta_2 Lerner_{it-1} + \beta_3 Size_{it} + \beta_4 Cap_{it} + \beta_5 Inflation_{it} + \beta_6 GDPGrowth_{it} + \beta_7 COVID19_{it} + \beta_8 Lerner_{it} \times COVID19_{it} + \varepsilon_{it} \quad (5)$$

where, i denotes bank i and t denotes year t. The inclusion of the lagged dependent variable captures

the persistence of bank stability over time, while the lagged competition variable reflects the dynamic impact of competition.

Table 1 summarizes the variables used in this study, including their codes, names, measurements, expected signs, supporting references, and data sources.

3.4. Estimation methodology

This study employs the System Generalized Method of Moments (SGMM) estimator, developed by Arellano and Bover (1995), to estimate the model.

The SGMM approach is used to address potential endogeneity issues as well as control for unobserved heterogeneity across banks. To ensure the validity of the model, diagnostic tests are conducted, including the Arellano–Bond test for autocorrelation and the Hansen test for the validity of instruments. The absence of second-order autocorrelation (AR(2)) and the validity of instruments confirm the reliability of the estimation results.

4. Research results

Table 2 presents the descriptive statistics of the variables used in the model. According to Table 2, the results show that the mean value of the Z-score (3.261173) indicates a moderate level of financial stability among Vietnamese commercial banks during the study period. The Lerner Index suggests that the banking sector operates under a certain degree of market power, reflecting imperfect competition. Standard deviations are moderate throughout, indicating no excessive dispersion and confirming the dataset's suitability for further analysis. Table 3 reports the correlation matrix among the variables.

Table 1: Variables in research model

Code	Variable name	Measurement	Expected signs	References
		Dependent variable: Bank stability		
Zscore	Bank stability	$\frac{ROA_{it} + Equity/TotalAsset_{it}}{ROA_{ip}}$		Dutta and Saha (2021) and Risfandy et al. (2022)
		Independent variables: Bank competition		
Lerner	Bank competition	$\frac{(Price - Marginal\ Cost)}{Price}$	+	Fiordelisi and Mare (2014), Fu et al. (2014), and Risfandy et al. (2022)
$Lerner_{t-1}$	Bank competition at time t-1		+	Authors' suggestion
		Control variables: Bank characteristics and macroeconomic conditions		
Size	Bank size	ln (Total Assets)	+	Berger et al. (2009), Chinoda and Kapingura (2023), Dutta and Saha (2021), Fiordelisi and Mare (2014), Nguyen et al. (2024), Risfandy et al. (2022), and Thanh Le et al. (2024)
Cap	Capitalization (%)	$\frac{Average\ Equity}{Total\ Assets}$	+/-	Berger et al. (2009) and Risfandy et al. (2022)
		Macroeconomic conditions		
Inflation	Inflation rate (%)	Annual growth rate of CPI	-	Berger et al. (2009), Chinoda and Kapingura (2023), Risfandy et al. (2022), and Thanh Le et al. (2024)
GDPGrowth	GDP growth rate (%)	Annual growth rate of GDP	+	
COVID19	COVID-19 occurrence	Dummy variable, 1 if the year is 2020-2021 and 0 otherwise	-	Authors' suggestion
Lerner × COVID19	Interaction term between Lerner and COVID19			Authors' suggestion

The Lerner Index serves as an inverse indicator for competition, implying that a positive (+) sign in the regression result indicates a negative impact of competition on stability

Table 2: Descriptive statistics

Variables	Obs	Mean	Std dev	Min	Max
Zscore	153	3.261173	2.526493	-2.665454	13.1675
Lerner	153	0.1263116	0.1157468	-0.1278122	0.462253
Size	153	26.47397	0.9106204	24.59925	28.46429
Cap	153	0.0814082	0.0291593	0.0382295	0.1709897
Inflation	153	2.735556	0.8976027	0.63	3.54
GDPGrowth	153	6.003412	1.934177	2.553729	8.123514
COVID19	153	0.3	0.4596114	0	1
Lerner x COVID19	153	0.0566532	0.1069207	-0.0905788	0.462253

Table 3: Correlation analysis

Variables	Zscore	Lerner	Size	Cap	Inflation	GDPGrowth	COVID19	LernerxCOVID19
Zscore	1							
Lerner	0.0253	1						
Size	0.2609	0.0680	1					
Cap	-0.5723	0.5993	-0.1181	1				
Inflation	0.0189	-0.1273	-0.0333	-0.0663	1			
GDPGrowth	0.1717	-0.1345	-0.1117	-0.0602	0.4937	1		
COVID19	0.0130	0.2936	0.2845	0.2220	-0.3678	-0.2504	1	
Lerner x COVID19	-0.2667	0.6504	0.2233	0.4692	-0.3274	-0.1646	0.7413	1

According to Table 3, Zscore correlates positively with Size (0.26) and GDPGrowth (0.17), and negatively with Cap (−0.57). Correlations between Zscore and Lerner, Inflation, and COVID19 are weak (all below 0.03 in absolute value). Among the regressors, the highest pairwise correlation is between COVID19 and Lerner × COVID19 (0.74), which is expected given the interaction term is mechanically derived from COVID19; Lerner and Cap (0.60) and Lerner and Lerner × COVID19 (0.65) are

also relatively high. The absolute values of the correlations among variables are all under 0.8, which means that the possibility of having multicollinearity in the model is not high. However, to make sure that multicollinearity does not happen in the model, the Variance Inflation Factor (VIF) test is going to be tested to check this problem. Normally, VIF under 10 is considered non-multicollinearity; however, this research would set the maximum VIF at 5 for a more reliable assessment of multicollinearity. The results of the VIF test are shown in Table 4. According to Table 4, the VIF values are all under 5, with a mean VIF of 2.64, indicating that there is no multicollinearity in the model. To provide a benchmark for comparison, this study first estimates benchmark models including pooled OLS, Fixed Effects Model (FEM), Random Effects Model (REM), and Generalized Least Squares (GLS).

These models do not include the lagged dependent variable and therefore do not capture the dynamic nature of bank stability. The results of OLS, REM, FEM, and GLS are illustrated in Table 5.

Table 4: VIF analysis

Variables	VIF
Lerner x COVID19	4.36
Lerner	4.28
L.Lerner	3.71
COVID19	2.88
Cap	1.73
Inflation	1.59
GDPGrowth	1.40
Size	1.18
Mean VIF	2.64

Table 5: Benchmark regression results

Variables	Pooled OLS	REM	FEM	GLS
Lerner	9.701162***	9.67795 ***	8.810942 ***	10.09448 ***
	(.6451458)	(.6426776)	(.5938021)	(.4568019)
L.Lerner	2.285718 ***	2.274889 ***	2.062779 ***	2.79132 ***
	(.6082927)	(.6072045)	(.5771196)	(.4228671)
Size	.2518242***	.2487765 ***	-.3643935 **	.2640241***
	(.0419881)	(.0432955)	(.1963935)	(.0431238)
Cap	-36.14439 ***	-36.08535 ***	-34.01145 ***	-38.52059 ***
	(1.68925)	(1.723425)	(2.915022)	(1.938961)
Inflation	-.52549 ***	-.5243295 ***	-.3612575 ***	-.5410904 ***
	(.0861564)	(.0856123)	(.0817586)	(.0493867)
GDPGrowth	.2300495 ***	.2297172 ***	.193371 ***	.2268612 ***
	(.0212164)	(.0210749)	(.0192389)	(.0125282)
COVID19	1.68078 ***	1.686279 ***	2.035191 ***	1.804901 ***
	(.1262666)	(.125686)	(.1334765)	(.0965587)
Lerner x COVID19	-12.82341 ***	-12.82992 ***	-12.3101 ***	-13.6725 ***
	(.6774278)	(.6751065)	(.6008163)	(.5467958)
_cons	-2.544343 ***	-2.465681 **	13.34557 ***	-2.761375 ***
	(1.143313)	(1.176558)	(5.061918)	(1.159672)
Number of Obs	122	122	122	122
Model suitability	F (8,113)	Wald chi2 (8)	F (8,98)	Wald chi2 (8)
Prob > F (chi2)	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses; ***: p <0.01; **: p< 0.05; *: p< 0.1)

All four models are jointly significant (p < 0.01). Specification tests favor FEM over pooled OLS (F-test, p = 0.0000) and REM over OLS (Breusch-Pagan, p = 0.0884), while the Hausman test favors FEM over REM (p = 0.0087). Ultimately, the FEM model is chosen as the best model for the research.

However, the Modified Wald test indicates groupwise heteroskedasticity (p = 0.0001), and the Wooldridge test indicates first-order autocorrelation (p = 0.0000); therefore, using FEM may lead to a model that is consistent but no longer efficient, and the test statistics may no longer be accurate. GLS is therefore estimated to address both issues. An additional endogeneity test indicates that some regressors are correlated with the error term, a problem none of the static estimators (FEM, REM, or GLS) can resolve. The System GMM estimator (Arellano and Bover, 1995) is therefore adopted, as it addresses endogeneity through internal instruments, accommodates the dynamic specification, and is robust to heteroskedasticity and autocorrelation. The study prefers the system over the difference GMM estimator to avoid the weak instrument and information loss problems associated with first differencing, and the study uses the two-step estimator with Windmeijer (2005) finite-sample correction for greater efficiency. Results are presented in Table 6.

Table 6: SGMM analysis

Variables	SGMM
L.Zscore	0.0447258 **
	(0.0196348)
Lerner	10.36187 ***
	(1.296349)
L.Lerner	1.951046 ***
	(0.7377105)
Size	0.2544297 ***
	(0.0554275)
Cap	-35.82009 ***
	(2.077397)
Inflation	-.4908804 ***
	(0.0672755)
GDPGrowth	0.2192406 ***
	(0.0220022)
COVID19	1.856652 ***
	(0.2447448)
Lerner x COVID19	-13.51688 ***
	(1.86708)
_cons	-2.9199
	(1.490133)
Number of Obs	121
Number of groups	16
Number of instruments	15
AR1 (p-value)	0.026
AR2 (p-value)	0.487
Hansen test (p-value)	0.357

Standard errors in parentheses; ***: p < 0.01; **: p < 0.05; *: p < 0.1

Following Roodman (2009), each right-hand-side variable is classified as GMM-style if potentially endogenous, or IV-style if strictly exogenous. L.Zscore and Lerner are treated as GMM-style, reflecting the dynamic persistence of the dependent variable and the possibility of reverse causality

between competition and stability. The interaction term Lerner×COVID19 is likewise treated as GMM-style, since it is a direct function of the endogenous Lerner variable. Size, Cap, Inflation, GDPGrowth, and COVID19 are treated as IV-style, assumed uncorrelated with contemporaneous stability shocks. The resulting instrument set (15 instruments, 16 groups) satisfies the Roodman (2009) rule of thumb, and diagnostics support the specification (AR(2) p = 0.487; Hansen p = 0.357).

The Arellano–Bond test confirms first-order autocorrelation (AR(1) p = 0.026, as expected under GMM) and the absence of second-order autocorrelation (AR(2) p = 0.487), while the Hansen test (p = 0.357) confirms joint instrument validity; with 15 instruments against 16 groups, the Roodman (2009) rule of thumb is satisfied. All diagnostics therefore support the reliability of the two-step SGMM specification.

In general, all variables examined in the model are statistically significant at the 1% level, except for the lagged dependent variable, which is significant at the 5% level. The signs of these variables are consistent with the study's expectations, except for the variable COVID19, which carries a positive sign instead of the expected negative sign. This result may reflect the effect of policy interventions by the State Bank of Vietnam during the pandemic period, which supported bank operations and partially offset the effects of the crisis. The use of a dynamic panel model allows the authors to test the impact of a bank's past stability on its present stability. The result is positive and significant at the 5% level, with a coefficient of 0.0447258, indicating that if the previous-period stability index increases by one point, the current-period bank stability index increases by 0.0447258 points, confirming the persistence of bank stability over time.

Specifically, the coefficient of the COVID19 variable is 1.856652, indicating that holding competition constant, bank stability during the COVID-19 period is 1.856652 points higher than in non-COVID periods. The coefficient of the Lerner×COVID19 interaction term is −13.51688, indicating that the stabilizing effect of lower competition is weaker during the COVID-19 period than under normal conditions. Since the Lerner Index is an inverse measure of competition, this negative interaction coefficient implies that the crisis period reverses the direction of the competition–stability relationship relative to the baseline estimate. A post-estimation lincom test on the sum of these two coefficients confirms this reversal is statistically significant: the net effect of the Lerner Index during COVID-19 is −3.155 (p < 0.001). In other words, during the COVID-19 period, greater market power (a higher Lerner Index) is associated with lower bank stability

As a robustness check, the study re-estimates the baseline model using an alternative stability measure, the non-performing loan ratio. The results confirm the baseline competition-fragility relationship: higher Lerner is associated with significantly lower NPL, consistent in direction with the Zscore-based results (Table 7). The net effect of competition during COVID-19 remains negative and statistically significant. Table 8 illustrates the variables' conclusions.

Table 7: Robustness check — alternative stability measure (ln NPL)

Variables	SGMM (ln_NPL)
L.ln_NPL	.6643086 ***
	(.129764)
Lerner	-2.381275 ***
	(.6523969)
L.Lerner	1.549983 ***
	(.3425185)
Size	-.1501656 **
	(.0659997)
Cap	-1.78355
	(4.912535)
Inflation	-.0347949
	(.0688947)
GDPGrowth	.0249768
	(.0189214)
COVID19	.5137553 **
	(.2299891)
Lerner x COVID19	-.6915341
	(.8566455)
_cons	2.640715
	(1.556091)
Net effect of Lerner during COVID-19 (lincom)	-3.072809 ***
	(1.029648)
Number of Obs	136
Number of groups	17
Number of instruments	15
AR1 (p-value)	0.020
AR2 (p-value)	0.118
Sargan test (p-value)	0.767
Hansen test (p-value)	0.491

Standard errors in parentheses; ***: p < 0.01; **: p < 0.05; *: p <0.1; Dependent variable is the natural logarithm of the non-performing loan ratio (ln_NPL); Higher values indicate lower stability; The Lerner x COVID19 interaction is not individually significant (p = 0.420); The net effect remains negative and significant, consistent in direction with (though not fully replicating the reversal pattern of) the baseline Zscore model

Table 8: Conclusions for the variables

Code	Variable name	Conclusions of the impacts on commercial bank stability
L.Zscore	One-period lagged bank stability	Positive
	Independent variable	
Lerner t	Bank competition	Negative
Lerner t-1	One-period lagged bank competition	Negative
	Control variables	
Size	Bank size	Positive
Cap	Capitalization	Negative
Inflation	Inflation rate	Negative
GDPGrowth	GDP growth rate	Positive
COVID19	COVID-19 occurrence	Positive
Lerner x COVID19	Bank competition in COVID-19	Positive
Net effect	Lerner + Lerner x COVID19	Positive

The Lerner index serves as an inverse indicator for competition, implying that a positive (+) sign in the regression result indicates a negative impact of competition on stability

5. Discussion

The results provide three main insights into the competition-stability relationship in Vietnam.

First, the positive and significant coefficient of the Lerner Index supports the competition–fragility hypothesis, suggesting that lower competition (higher market power) contributes to higher bank stability. This is consistent with the franchise-value mechanism (Keeley, 1990), in which greater market power raises profit margins and franchise value, giving banks stronger incentives to avoid excessive risk-taking. In addition, in a less competitive environment, banks may have more flexibility in managing their loan portfolios and pricing strategies, allowing them to better control credit risk. Recent evidence from Vietnam also supports this argument, showing that increased competition may reduce stability (Tran and Nguyen, 2025). Therefore, the negative relationship between competition and stability observed in this study is consistent with both theoretical arguments and empirical evidence.

Second, the significant lagged competition coefficient confirms that this effect persists over time rather than being fully absorbed within a single period. This suggests that banks do not immediately adjust their risk-taking behavior in response to changes in market competition, consistent with the view that lending policies and capital allocation decisions are adjusted gradually, according to Arellano and Bond (1991).

Third, the negative and significant Lerner × COVID19 interaction indicates that the competition–stability relationship reverses sign during the crisis. The formal post-estimation test confirms this reversal is statistically significant: the net effect of the Lerner Index during COVID-19 is -3.155 (SE = 0.855, z = -3.69, $p < 0.001$), meaning that greater market power is associated with significantly lower stability during the crisis period. This is consistent with recent Vietnamese evidence that competition can support bank stability during crisis periods when accompanied by coordinated policy support (Nguyen et al., 2024).

This reversal is explained by SBV policy intervention operating through three transmission channels. First, Circular No. 01/2020/TT-NHNN allowed banks to reschedule loans without reclassification for COVID-19-affected borrowers, suspending the usual link between aggressive competitive lending and immediate provisioning costs. Second, Resolution No. 43/2022/QH15 introduced a 2 percent interest-rate support package channeled through the banking system, which reduced the marginal cost of maintaining credit growth for competitively pressured banks without requiring them to bid down lending rates further, thereby dampening the erosion of margins that typically links competition to risk-taking under the franchise-value mechanism. Third, Decree No. 15/2022/ND-CP, together with directive guidance from the SBV on credit growth quotas, constrained the pace at which any individual bank could expand its loan book regardless of its competitive position, effectively capping the risk-taking channel through which competition would normally translate into instability.

Together, these interventions imply that during COVID-19, the transmission from competitive pressure to risk-taking behavior was partially severed by regulatory design. This conditional pattern also explains why the literature reports mixed findings: in normal periods, the competition–fragility effect may dominate, but under strong policy support, the competition–stability effect can prevail during crises.

The findings of this study provide several important implications for policymakers and bank management in Vietnam.

First, the results suggest that competition and financial stability should not be considered as mutually exclusive objectives. Under normal conditions, market power helps preserve franchise value and curb excessive risk-taking. Therefore, regulators should avoid promoting excessive competition that may weaken the stability of the banking system.

Second, this relationship reverses during crisis periods. The net effect of market power on stability during COVID-19 is significantly negative, indicating that greater competition supported rather than undermined stability when regulatory measures such as Circular 01/2020/TT-NHNN and Resolution 43/2022/QH15 were implemented. This suggests that policymakers should adopt a more flexible approach, allowing for a higher level of competition during periods of economic stress, while maintaining effective supervision and control mechanisms, rather than applying uniform competition policy across normal and crisis periods

Third, bank managers should recognize that the competition-stability relationship is state-dependent. In stable periods, banks operating in more competitive segments should prioritize risk management and capital buffers; during systemic shocks, this pressure decreases but should not be mistaken as a permanent shift, because the reversal observed here is tied to specific, time-bound policy interventions rather than a structural change in the competition-stability relationship.

This study is subject to several limitations. First, the sample is restricted to 17 listed commercial banks over 2015–2023, as unlisted, policy, and foreign-owned banks are excluded; future studies may assess data from more commercial banks. Second, the COVID-19 dummy captures crisis occurrence but not variation in pandemic severity across time; therefore, future research may employ continuous stringency measures. Third, while the translog cost function underlying the Lerner Index satisfies linear homogeneity in input prices, the monotonicity condition is violated for a substantial share of bank-year observations across the sample. This is a known limitation of Lerner Index estimation in the literature and suggests some caution in interpreting the precise magnitude of the

competition measure. Fourth, the Z-score relies on accounting-based ROA and assumes approximate normality of return volatility; although this study additionally validates the main findings using an alternative stability measure, future research could further extend robustness using market-based or subsample analyses as the panel grows. Fifth, the sample includes a small number of extreme Z-score observations, and this study does not formally test sensitivity to these values through winsorization (limiting extreme values to predetermined percentile thresholds) or robust regression; future work could apply such techniques as a sensitivity check.

6. Conclusion

This study examines the relationship between bank competition and financial stability in Vietnam over the period 2015–2023. The results show that competition has a negative effect on stability under normal conditions, supporting the competition–fragility hypothesis. In addition, the findings confirm that the impact of competition persists over time. Most importantly, the study finds that the relationship between competition and stability changes during crisis periods. Competition appears to contribute positively to bank stability during the COVID-19 period, suggesting that its impact is conditional on macroeconomic conditions. Overall, the findings highlight that the competition–stability relationship is not constant but depends on the economic environment. This study contributes by providing evidence from a transition economy and emphasizing the importance of considering crisis conditions. Future research may extend the analysis using alternative measures and broader datasets. The study suggests that policies promoting competition should be designed flexibly, considering different economic conditions rather than applying a uniform approach.

List of abbreviations

AR(1)	First-order autocorrelation
AR(2)	Second-order autocorrelation
cons	Constant
CPI	Consumer price index
FEM	Fixed effects model
GDP	Gross domestic product
GLS	Generalized least squares
GMM	Generalized method of moments
HNX	Hanoi Stock Exchange
HOSE	Ho Chi Minh Stock Exchange
IV	Instrumental variable
L.	Lagged value
ln	Natural logarithm
MC	Marginal cost
NPL	Non-performing loan
Obs	Observations
OLS	Ordinary least squares
REM	Random effects model
ROA	Return on assets
SBV	State Bank of Vietnam
SE	Standard error
SGMM	System generalized method of moments
Std dev	Standard deviation
VIF	Variance inflation factor

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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