

How market concentration influences bank lending? Empirical evidence from Vietnam



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ABSTRACT

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This paper investigates how market concentration affects bank lending in Vietnam, utilizing an unbalanced panel of 28 commercial banks from 2007 to 2023. Results indicate that greater market concentration enhances bank lending, implying dominant banks use their market power to expand credit. Quantile regression reveals this effect is stronger among banks with high loan growth, underscoring the significance of economies of scale, stable funding sources, and relationship banking in facilitating credit expansion within a concentrated banking sector. Bank-specific factors such as profitability, funding diversification, and CASA ratio also significantly drive loan growth. Robustness checks using Herfindahl-Hirschman indexes based on total loans and deposits confirm these outcomes. Contrary to traditional competition theory, the findings suggest that concentration can foster credit expansion in Vietnam's banking sector. Notably, the positive concentration-lending nexus is more substantial in higher loan growth quantiles, indicating heterogeneous effects across the credit supply distribution. The study incorporates key macroeconomic variables—GDP growth, inflation, and the COVID-19 pandemic to offer a comprehensive view of Vietnam's lending landscape. These insights contribute to shaping competition policies and banking reforms in emerging markets, providing empirical support for the relationship between market structure and credit dynamics in transitional economies.

Contribution/ Originality: This study employs a quantile regression approach to explore the distributional effects of market concentration on bank lending. It also applies multiple econometric techniques to ensure robustness. Additionally, this paper utilizes diverse HHI measures based on assets, loans, and deposits to comprehensively capture the impact of market concentration on bank lending in Vietnam.

1. INTRODUCTION

The relationship between market concentration and bank lending has long been a central topic in financial and economic research. The banking sector plays a crucial role in mobilizing savings, allocating credit, and supporting economic development (Molyneux, Casu, & Girardone, 2006).

Market concentration or competition (in the opposite direction) within the banking sector influences not only the availability and cost of credit but also the risk-taking behavior of financial institutions (Boot & Thakor, 2000). However, there remains considerable debate about whether increased banking competition leads to better credit allocation and financial inclusion or, conversely, contributes to excessive risk-taking and financial instability (Boyd & De Nicolo, 2005).

This issue is particularly relevant in emerging economies like Vietnam, where the banking sector has undergone significant reforms and liberalization over the past two decades (Nguyen & Nghiem, 2020; Vo, 2018).

Vietnam's financial sector has experienced profound transformations, transitioning from a state-dominated banking system to a more competitive environment. Historically, the Vietnamese banking industry was characterized by a small number of large state-owned commercial banks (SOCBs) that controlled most financial activities. However, since the 1990s, a series of financial liberalization measures, regulatory reforms, and the entrance of private and foreign banks have increased competition in the industry (Nguyen, 2020).

While these changes have improved financial intermediation and expanded credit access, concerns remain regarding market power, lending efficiency, and financial stability. The coexistence of state-owned, joint-stock, and foreign banks in Vietnam has led to complex competitive dynamics that influence lending behavior, interest rates, and credit risk exposure (Dang & Nguyen, 2023).

Meanwhile, the empirical evidence on banking concentration and lending in Vietnam remains relatively limited, with existing studies providing conflicting results. Dang and Nguyen (2023) used the Lerner index to measure the market power of Vietnamese banks, finding that banks with greater market power tend to be more restrictive in providing credit. In contrast, Huynh (2023) found that greater market concentration promotes the lending growth rate of Vietnamese banks. Meanwhile, Vo (2018) concluded that bank market concentration is irrelevant in explaining the bank lending behavior of Vietnamese banks and highlights that the Vietnamese bank market offers giant potential for foreign bank entry.

This study advances the literature by offering empirical insights from Vietnam, an emerging economy with a developing banking sector.

First, this paper investigates the influence of market concentration on the lending behavior of Vietnamese commercial banks.

Second, this paper employs a quantile regression approach to capture the heterogeneous effects of market concentration across different levels of bank lending, highlighting distributional variations in the concentration-lending relationship.

Third, the study extends prior research by utilizing a long-term panel dataset (2007–2023), covering major economic shocks such as COVID-19, and applying a range of robust econometric techniques to ensure the validity of results.

It also verifies the consistency of findings using alternative concentration measures (lending and deposit-based HHI) and highlights the heterogeneous effects of market concentration across different lending quantiles a novel perspective in the context of emerging markets. These insights offer timely implications for banking regulation and competition policy in transitional financial systems. The remainder of this paper is structured as follows: Section 2 reviews the relevant literature on bank concentration and bank lending behavior. Section 3 presents the research methodology and data sources. Section 4 discusses empirical findings, while Section 5 concludes our study.

2. LITERATURE REVIEW

2.1. Market Concentration

Curry and George (1983) define market concentration as a factor of market structure reflecting the distribution of quantity and scale of firms selling a specific product or a collection of products. Concentration plays a crucial role in determining market power and, subsequently, business behavior and performance. More specifically, Tirole (1988) supposes that market concentration refers to identifying how many firms dominate the production of a specific product in a particular market and whether there are opportunities for new firms to compete in that market. Similarly, Bajgar, Berlingieri, Calligaris, Criscuolo, and Timmis (2023) describe market concentration as the significance of leading companies in a market for specific products or services.

Consequently, Demirgüç-Kunt and Levine (2000), Bikker (2004), and Beck, Demirgüç-Kunt, and Levine (2006) equate market concentration in the banking sector with the ratio of assets and lending of the largest banks in the system. Thus, market concentration in the banking sector can be defined as the dominance of a few of the largest banks within the entire banking system.

Many previous studies have focused on collecting indexes to measure the level of concentration in banking, among which the two most common tools applied are the Concentration Ratio (CR) and the Herfindahl-Hirschman Index (Davcev & Hourvoulades, 2013). The CR refers to the market share of the largest banks in the system (Lijesen, Nijkamp, & Rietveld, 2002). With that broad definition, we have CR3, CR4, CR5, CR8, and CR10, representing the total market share of the three, four, five, eight, or ten largest banks in the banking system, respectively. The higher the CR index, the higher the level of concentration in banking. However, Bikker (2004) notes that its value is an absolute measure of concentration with an arbitrary cutoff point, leading to some issues when comparing CR values for samples of different sizes.

For example, the CR index will still differ significantly if we compare two samples with the same distribution one with 100 banks and another with 1000 banks, even if both samples have the same concentration index. Another index measuring the level of concentration that many studies use is the Herfindahl-Hirschman Index (HHI), estimated based on the Cournot model and determined by the sum of the squared market shares of firms in a market (Lijesen et al., 2002). This method calculates the HHI index using the following formula.

$$HHI = \sum_{i=1}^n (MS_i)^2$$

In which:

HHI: The concentration level of the banking system.

MS_i: The market share of bank *i* in the system.

n: The total number of banks in the system.

According to Akomea and Adusei (2013), the Herfindahl-Hirschman Index (HHI) captures both the size and the relative distribution of banks within a financial system. The index trends toward zero in markets characterized by a large number of banks of similar size and increases as the number declines or the disparity in their sizes widens. A major benefit of the HHI compared to concentration ratios (CRs) is that it takes into account all market players, allowing for a better understanding of the market structure. Consequently, this study adopts the HHI as the primary metric for evaluating bank concentration in Vietnam.

2.2. Impacts of Market Concentration on Bank Lending

Although it has received much attention from scholars, there is still no consensus on the impact of market concentration on banks' lending behavior. On the one hand, some scholars argue that greater market concentration enhances bank lending. In concentrated banking markets, larger and more powerful banks are able to build closer lending relationships with their customers (Klein, 1971) as well as benefit from economies of scale, lower operational expenses, and increased market power, allowing them to expand credit supply more effectively (Petersen & Rajan, 1995). Additionally, these banks tend to engage in relationship lending, fostering long-term lending commitments, particularly for small and medium-sized enterprises (Boot & Thakor, 2000). The stability of concentrated markets also allows banks to undertake longer-term lending projects with lower risks, further encouraging credit expansion (Cetorelli & Gambera, 2001).

In addition, when banks have greater market power in a more concentrated market, they can access alternative sources of funding more easily, thereby increasing their ability to expand lending activities and provide credit to the economy at a higher level (Gambacorta & Marques-Ibanez, 2011).

On the other hand, several research studies suggest that increased market concentration results in restricted bank lending. In highly concentrated markets, dominant banks may exploit their market power by imposing higher interest rates and limiting credit access, particularly to smaller firms (Carbó-Valverde, Rodríguez-Fernandez, &

Udell, 2009). Reduced competition can also lead to inefficiencies and discourage financial institutions from optimizing credit allocation, ultimately reducing lending volumes (Beck, Demirgüç-Kunt, & Maksimovic, 2004). Furthermore, high concentration may increase financial fragility, leading banks to adopt more conservative lending practices to mitigate risk (Boyd & De Nicro, 2005). Based on these two streams of research, this paper proposes the following hypotheses:

H_{1a}: Higher market concentration increases bank lending.

H_{1b}: Higher market concentration decreases bank lending.

3. DATA AND METHODOLOGY

3.1. Data

This paper utilizes an unbalanced panel dataset consisting of 28 Vietnamese commercial banks from 2007 to 2023, comprising a total of 451 observations.

This dataset is collected from the WiData database. This paper winsorizes all variables at the 1st and 99th percentile levels to remove potential outlier effects in the analyses.

3.2. Model Specification

To conduct quantitative analysis on the market concentration and bank lending, this paper proposes the following equation.

$$LG_{i,t} = \beta_0 + \beta_1 HHI_{assets_t} + \sum_{i=1}^k \beta_{2i} Controls_i + \delta_i + \varepsilon_{i,t}$$

Following Tran (2020), this paper uses the loan growth rate as the main dependent variable. The main independent variable is HHI assets_t, representing the market concentration of the Vietnamese banking sector at year t. The control variables included in the model are bank size, bank performance, the equity-to-total-assets ratio, funding diversification, the current account savings account ratio (CASA), economic growth, inflation, and the COVID-19 pandemic dummy variable.

In addition, following Nguyen, Pham, Phan, Alam, and Tran (2024), this paper includes bank fixed-effects (δ_i) to control for unobservable, stationary bank characteristics such as corporate culture, bank management... However, this paper does not control for time fixed-effects in model specification because the Herfindahl-Hirschman Index (HHI) is the same for all banks in a given year, so including time fixed-effects mechanically absorbs all the explanatory power of HHI (Gulen & Ion, 2016). Table 1 presents the details of the variable measurements.

The selection of variables is grounded in prior empirical literature on bank lending and market structure (e.g., Beck et al., 2004; Nguyen et al., 2024; Petersen & Rajan, 1995).

The loan growth rate is chosen as the dependent variable as it directly captures changes in credit supply. Market concentration is measured by the Herfindahl-Hirschman Index (HHI), a widely accepted metric for assessing structural dominance in the banking industry.

Control variables such as bank size, profitability, capitalization, and funding diversification are included to isolate the effect of concentration from other determinants of loan supply. Macroeconomic variables (GDP, inflation) and a COVID-19 dummy are incorporated to account for external shocks.

The methodological approach combines panel fixed-effects models with robustness techniques (GMM, Prais-Winsten, Newey-West, two-way clustering) to address issues of endogeneity, autocorrelation, and heteroscedasticity. Quantile regression is employed to uncover heterogeneous effects across the distribution of loan growth, offering a deeper insight beyond mean estimations. This combination ensures empirical rigor and enhances the credibility of the findings.

Table 1. Variables description.

Variables	Abbreviation	Variable measurements
Dependent variables		
Loan growth rate	LG	$LG = \frac{\text{Total loans at year } t}{\text{Total loans at year } t-1} - 1$
Independent variables		
Market concentration (Based on total assets)	HHI assets	HHI assets = $\sum_{i=1}^n (MS_i)^2$ MS _i : The total assets of bank i
Market concentration (Based on total lending)	HHI lending	HHI lending = $\sum_{i=1}^n (MS_i)^2$ MS _i : The total lending of bank i
Market concentration (Based on total deposit)	HHI deposit	HHI deposit = $\sum_{i=1}^n (MS_i)^2$ MS _i : The total deposit of bank i
Bank size	Size	SIZE = Ln (Total assets)
Return on assets	ROA	$ROA = \frac{\text{Net income}}{\text{Total Assets}}$
Capitalization	Capital	$Cap = \frac{\text{Total equity}}{\text{Total assets}}$
Funding diversification	FDIV	$FDIV = 1 - \left[\left(\frac{EQU}{FUND} \right)^2 + \left(\frac{GOV}{FUND} \right)^2 + \left(\frac{IBD}{FUND} \right)^2 + \left(\frac{CD}{FUND} \right)^2 + \left(\frac{DER}{FUND} \right)^2 + \left(\frac{FF}{FUND} \right)^2 + \left(\frac{VP}{FUND} \right)^2 + \left(\frac{OTHER}{FUND} \right)^2 \right]$ <p>Where: FUND: Total funding of bank EQU: Shareholders' equity GOV: Amounts due to the government and the state banks IBD: Deposits and borrowings from other credit institutions CD: Deposit from customers DER: Derivative financial instruments and other financial liabilities FF: Funds for finance, entrusted investments and entrusted loans VP: Valuable papers issued Other: Other liabilities following (Pham & Nguyen, 2023)</p>
Current account savings account	CASA	$CASA = \frac{\text{Total demand deposit}}{\text{Total deposit}}$
Gross domestic product	GDP	GDP growth rate
Inflation	INF	Inflation rate
COVID-19	COVID	Dummy variable - takes the value "1" in years 2020-2023; "0" for the remaining years

Table 2. Descriptive statistical analysis.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
LG	440	0.310	0.775	-0.313	11.317
NPL	352	0.022	0.021	0.000	0.298
HHI assets	451	0.093	0.012	0.081	0.126
Size	451	32.229	1.339	28.342	35.372
ROA	451	0.010	0.008	-0.055	0.060
Capital	451	0.100	0.053	0.041	0.462
FDIV	451	0.525	0.114	0.195	0.773
CASA	353	0.154	0.097	0.010	0.505
GDP	451	0.060	0.015	0.026	0.081
Inflation	451	0.063	0.057	0.006	0.231
COVID	451	0.246	0.431	0	1

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics for the dataset. The average loan growth rate of Vietnamese commercial banks over the 2007–2023 period is 0.31, with a standard deviation of 0.775.

The minimum value of -0.313 was observed for Southeast Asia Commercial Joint Stock Bank in 2008, while the maximum value of 11.317 was recorded by National Citizen Commercial Joint Stock Bank in 2007. Regarding the key explanatory variable, market concentration measured by the Herfindahl-Hirschman Index (HHI) exhibits a mean of 0.093 and a standard deviation of 0.012, with values ranging between 0.081 and 0.126.

Table 3. Correlation matrix.

Variable	HHI assets	Size	ROA	Capital	FDIV	CASA	GDP	Inflation	COVID
HHI assets	1.000								
Size	-0.357	1.000							
ROA	-0.066	0.268	1.000						
Capital	0.215	-0.536	0.290	1.000					
FDIV	0.007	-0.109	0.348	0.259	1.000				
CASA	0.107	0.384	0.399	0.054	0.051	1.000			
GDP	0.332	-0.070	-0.080	-0.020	0.003	-0.067	1.000		
Inflation	0.447	-0.333	0.090	0.315	0.353	0.018	0.025	1.000	
COVID	-0.594	0.345	0.213	-0.102	-0.014	0.047	-0.543	-0.315	1.000

The correlation coefficient quantifies the strength and direction of the linear association between two variables. As shown in Table 3, all correlation coefficients between the independent variables are below 0.80, which means there are no multicollinearity issues, and they are appropriate to include in the regression analysis (Judge, Griffiths, Hill, Lütkepohl, & Lee, 1991).

4.2. Main Results

Table 4 presents the main research results, in which Model (1) conducts a single regression of the HHI variable to assess the unique impact of market concentration on bank lending. Model (2) adds control variables. Models (3)–(6) respectively use: (i) two-step GMM regression to solve the endogeneity problem; (ii) Prais-Winsten regression to overcome the autocorrelation issue; (iii) Newey-West regression to produce consistent estimates in the presence of autocorrelation and heteroscedasticity; and (iv) two-way cluster regression by bank and time to minimize the potential impact of heteroscedasticity and autocorrelation in panel data.

Table 4. Empirical results.

Variables	Baseline (1)	Additional variables (2)	GMM (3)	Prais-Winsten (4)	Newey-West (5)	Two-way cluster (6)
HHI assets	11.764*** (1.084)	5.643*** (1.746)	7.089** (3.352)	9.833*** (1.923)	10.175*** (2.989)	5.643** (2.393)
Size		-0.273*** (0.029)	-0.217*** (0.030)	-0.098*** (0.016)	-0.079*** (0.022)	-0.273*** (0.048)
ROA		12.053*** (2.529)	8.220* (4.957)	7.563*** (2.628)	7.540** (2.926)	12.053*** (4.070)
Capital		-1.844*** (0.361)	-1.995*** (0.435)	-1.612*** (0.401)	-1.580*** (0.525)	-1.844*** (0.551)
FDIV		0.454*** (0.129)	1.601*** (0.320)	0.557*** (0.128)	0.541*** (0.109)	0.454*** (0.142)
CASA		0.594** (0.231)	1.363** (0.606)	0.604*** (0.166)	0.385** (0.167)	0.594* (0.310)
GDP		0.569 (0.721)	-0.336 (0.657)	-1.048 (0.685)	-1.287** (0.570)	0.569 (0.568)
Inflation		-2.473*** (0.300)	-2.841*** (0.435)	-2.042*** (0.268)	-1.338*** (0.302)	-2.473*** (0.455)
COVID		0.102*** (0.037)	0.038 (0.025)	-0.023 (0.036)	-0.026 (0.034)	0.102*** (0.037)
L.LG			-0.107*** (0.020)			
Constant	-0.818*** (0.101)	8.382*** (1.003)	5.939*** (1.018)	2.412*** (0.604)	1.763*** (0.675)	8.382*** (1.554)

Note: All financial variables are winsorized at 1% level on top and bottom of the distribution. ***, **, * indicate significance at the 1%, 5%, and 10% level respectively. Standard errors are clustered at the bank level. Numbers in parentheses are standard errors.

The results in Table 4 show that market concentration (HHI assets) has a positive impact on the loan growth rate (LG) of Vietnamese commercial banks in the research sample and is statistically significant in all research models, implying that in a more concentrated market, Vietnamese commercial banks tend to provide more credit. This result is similar to the research of Petersen and Rajan (1995), Boot and Thakor (2000), Cetorelli and Gambera (2001), Gambacorta and Marques-Ibanez (2011), and Huynh (2023). Accordingly, high market concentration enhances the market power of large commercial banks, enabling them to set lending rates and loan terms more favorably. When a few dominant banks control a significant share of the market, they face less competition from smaller financial institutions. As a result, they can extend more credit to businesses and consumers without experiencing a substantial decline in profitability. This ability to influence loan pricing encourages banks to expand their lending portfolios, contributing to higher credit growth. Secondly, banks in highly concentrated markets often engage in more aggressive lending strategies to sustain or enhance their market dominance. With fewer competitors, large banks have more stable funding sources, allowing them to increase loan disbursement without facing liquidity constraints. Moreover, in such an environment, banks may adopt higher risk-taking behavior, as they anticipate that their systemic importance could lead to regulatory or government interventions in times of financial distress. This moral hazard effect can lead to increased lending, as banks feel assured of external support if risks materialize. Furthermore, concentrated banking markets can foster stronger customer relationships, leading to higher credit demand and supply. Large banks have better access to customer data, allowing them to assess credit risk more accurately and extend loans with greater confidence. Their established reputation also attracts more deposit inflows, which in turn enhances their ability to finance loans at lower costs. This cycle of increased lending and deposit growth reinforces the trend of higher credit expansion in concentrated banking sectors. Last but not least, economies of scale play a crucial role in explaining why higher market concentration leads to greater credit expansion. Large banks benefit from lower operational expenses per unit of loan due to their extensive branch networks, technological advantages, and customer base. These cost efficiencies allow them to allocate more capital toward lending while maintaining profitability. Additionally, a concentrated banking sector facilitates the flow of credit to large enterprises, infrastructure projects, and government initiatives, further driving overall credit growth.

Regarding the control variables, the research results in Table 4 also show that bank performance (Return on Assets), funding diversification (FDIV), and current account savings account ratio (CASA) have a positive impact on the credit growth of Vietnamese commercial banks and are statistically significant in many different econometric models. A higher return on assets reflects better profitability, enabling banks to expand lending activities with greater financial stability. Funding diversification reduces reliance on specific funding sources, enhancing liquidity and allowing banks to allocate more resources to credit expansion. Meanwhile, a higher CASA ratio indicates a larger proportion of low-cost deposits, lowering funding costs and increasing banks' capacity to provide loans competitively. In addition, during the crisis caused by the COVID-19 pandemic, the government and the State Bank of Vietnam have applied expansionary monetary policies, implemented a policy of restructuring debt repayment terms, exempted and reduced interest and fees, and maintained debt groups to support customers affected by the COVID-19 pandemic, thereby increasing credit supply to support economic recovery.

4.3. Alternative Measurements of Market Concentration

To test the robustness of the research results, this paper uses alternative measurements of the Vietnamese banking market concentration, including HHI based on total lending (HHI lending) and total deposits (HHI deposit), because the main role of Vietnamese commercial banks is to act as intermediaries between depositors (deposit mobilization activities) and borrowers (lending activities). Therefore, HHI lending and HHI deposit will reflect the concentration level of the Vietnamese banking sector according to the main activities of banks. The research results are presented in Table 5.

Table 5. Alternative measurements of market concentration.

Variables	LG (7)	LG (8)
HHI lending	8.328** (3.215)	
HHI deposit		6.821*** (2.121)
Size	-0.234*** (0.051)	-0.269*** (0.046)
ROA	12.164*** (4.058)	10.318*** (3.954)
Capital	-1.815*** (0.544)	-1.601*** (0.517)
FDIV	0.388*** (0.137)	0.406*** (0.139)
CASA	0.647** (0.300)	0.470* (0.283)
GDP	1.607*** (0.574)	0.881* (0.516)
Inflation	-2.975*** (0.543)	-2.810*** (0.501)
COVID	0.160*** (0.046)	0.079** (0.034)
Constant	6.738*** (1.799)	8.174*** (1.488)

Note: All financial variables are winsorized at 1% level on top and bottom of the distribution. ***, **, * indicate significance at the 1%, 5%, and 10% level respectively. Standard errors are clustered at the bank level. Numbers in parentheses are standard errors.

The research results in Models (7) and (8) in Table 5 show that the regression coefficients of HHI lending and HHI deposit are positive and statistically significant at the 5% and 1% levels, respectively. This result once again reinforces the main research finding of the paper, indicating the positive impact of market concentration on the loan growth rate of Vietnamese commercial banks.

4.4. Quantile Regression Results

With the aim of providing a more profound insight into the impact of market concentration on Vietnamese commercial banks' lending behavior, this paper conducts quantile regression to assess whether there are differences in the impact of market concentration on bank lending across different quantiles of loan growth rate. The traditional regression method (OLS) usually relies on the mean value of the sample and assumes that the relationship between market concentration and the loan growth rate of commercial banks is homogeneous. However, when the research sample is heterogeneous, the traditional OLS method may not provide reliable empirical conclusions. In contrast, quantile regression considers different conditional quantiles, which helps to detect potential heterogeneities in the data instead of focusing on a single representative value of the central behavior of the research sample. Additionally, quantile regression overcomes the limitation of OLS by not requiring the assumption that the error distribution is uniform at different LG quantiles.

Table 6. Quantile regression results.

Variables	Q10 th (1)	Q30 th (2)	Q50 th (3)	Q70 th (4)	Q90 th (5)
HHI assets	4.871* (2.639)	7.296*** (2.555)	9.159*** (2.763)	11.946*** (3.510)	17.727*** (5.280)
Size	-0.019 (0.012)	-0.046*** (0.013)	-0.067*** (0.018)	-0.099*** (0.029)	-0.164*** (0.054)
ROA	4.660** (2.276)	5.977*** (2.135)	6.985*** (2.529)	8.502** (3.631)	11.640* (6.577)
Capital	-1.063*** (0.364)	-1.299*** (0.355)	-1.480*** (0.446)	-1.752*** (0.665)	-2.315* (1.184)
FDIV	0.312*** (0.078)	0.417*** (0.076)	0.497*** (0.094)	0.618*** (0.139)	0.868*** (0.245)
CASA	0.125 (0.128)	0.244* (0.125)	0.335** (0.147)	0.472** (0.204)	0.755** (0.340)
GDP	0.381 (0.444)	-0.382 (0.420)	-0.966** (0.492)	-1.844*** (0.708)	-3.662*** (1.347)
Inflation	-1.187*** (0.291)	-1.256*** (0.263)	-1.309*** (0.277)	-1.388*** (0.350)	-1.553*** (0.584)
COVID	0.006 (0.027)	-0.009 (0.026)	-0.020 (0.030)	-0.036 (0.040)	-0.071 (0.072)
Constant	0.147 (0.487)	0.886** (0.447)	1.451** (0.566)	2.303*** (0.875)	4.065** (1.672)

Note: All financial variables are winsorized at 1% level on top and bottom of the distribution. ***, **, * indicate significance at the 1%, 5%, and 10% level respectively. Numbers in parentheses are standard errors.

The findings reported in Table 6 reinforce the main results, confirming a positive relationship between market concentration and loan growth among Vietnamese commercial banks. Specifically, the coefficients for the HHI based on total assets in Columns (1)–(5) consistently exhibit a positive sign and demonstrate a progressive increase in magnitude across higher quantiles. These results suggest that banks positioned in higher loan growth quantiles benefit more significantly from a concentrated market structure, enabling them to expand credit more effectively compared to lower-loan growth banks. Overall, the empirical evidence indicates that market concentration not only influences the conditional mean of loan growth but also affects its distribution across the lending spectrum.

5. CONCLUSIONS AND POLICY IMPLICATIONS

This study provides empirical insights into how market concentration influences the lending activities of banks in Vietnam. Utilizing an unbalanced panel comprising 28 commercial banks over the period 2007–2023, this paper reveals a positive relationship between higher market concentration and increased credit expansion. These outcomes are consistent across multiple econometric specifications. Furthermore, the quantile regression approach highlights that this effect is particularly significant among banks exhibiting higher levels of loan growth. These findings suggest that in a more concentrated banking environment, banks are better positioned to enhance lending through market

dominance, benefiting from economies of scale, stable funding sources, and stronger customer relationships. Additionally, key internal bank-specific factors such as bank performance, funding diversification, and current account savings account ratio (CASA) are also found to exert a favorable influence on credit growth across Vietnam's banking sector. The findings of this paper carry important implications for policymakers, banking regulators, and financial market stakeholders in Vietnam and other emerging economies. First, the positive association between market concentration and bank lending challenges conventional wisdom that competition is always superior. Policymakers should recognize that in certain institutional contexts, particularly where regulatory frameworks are evolving, moderate levels of concentration may foster financial stability and improve credit availability. Encouraging consolidation among smaller, inefficient banks into stronger institutions can thus enhance lending capacity without necessarily compromising market contestability. Second, the study highlights the significance of bank-specific fundamentals, such as profitability, funding diversification, and CASA ratios, in supporting loan growth. Policies aimed at enhancing these internal factors such as improving corporate governance, diversifying funding sources, and promoting digital banking can complement structural reforms to achieve more sustainable credit expansion. Last but not least, given the heterogeneity across the lending distribution revealed by quantile regression, one-size-fits-all policies may be suboptimal. Targeted regulatory interventions and differentiated supervision for banks operating at different stages of credit growth may ensure a more balanced and inclusive financial development. Collectively, these policy insights emphasize the need for nuanced and data-driven approaches when designing banking sector reforms in transitional economies like Vietnam.

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Data Availability Statement: Upon a reasonable request, the supporting data of this study can be provided by Minh Nhat Nguyen.

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REFERENCES

- Akomea, S. Y., & Adusei, M. (2013). Bank recapitalization and market concentration in Ghana's banking industry: A Herfindahl-Hirschman index analysis. *Global Journal of Business Research*, 7(3), 31–45.
- Bajgar, M., Berlingieri, G., Calligaris, S., Criscuolo, C., & Timmis, J. (2023). Industry concentration in Europe and North America. *Industrial and Corporate Change*, 34(3), 407–424. <https://doi.org/10.1093/icc/dtac059>
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. *Journal of Banking & Finance*, 30(5), 1581–1603. <https://doi.org/10.1016/j.jbankfin.2005.05.010>
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2004). Bank competition and access to finance: International evidence. *Journal of Money, Credit and Banking*, 36(3), 627–648.
- Bikker, J. A. (2004). Competition and efficiency in a unified European banking market. In *Competition and Efficiency in a Unified European Banking Market*. Cheltenham, UK: Edward Elgar Publishing.
- Boot, A. W. A., & Thakor, A. V. (2000). Can relationship banking survive competition? *The Journal of Finance*, 55(2), 679–713. <https://doi.org/10.1111/0022-1082.00223>
- Boyd, J. H., & De Nicolò, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance*, 60(3), 1329–1343. <https://doi.org/10.1111/j.1540-6261.2005.00763.x>
- Carbó-Valverde, S., Rodríguez-Fernández, F., & Udell, G. F. (2009). Bank market power and SME financing constraints. *Review of Finance*, 13(2), 309–340. <https://doi.org/10.1093/rof/rfp003>
- Cetorelli, N., & Gambera, M. (2001). Banking market structure, financial dependence and growth: International evidence from industry data. *The Journal of Finance*, 56(2), 617–648. <https://doi.org/10.1111/0022-1082.00339>

- Curry, B., & George, K. D. (1983). Industrial concentration: A survey. *The Journal of Industrial Economics*, 31(3), 203-255. <https://doi.org/10.2307/2097885>
- Dang, V. D., & Nguyen, H. C. (2023). Banking uncertainty and lending: Does bank competition matter? *Journal of Asia Business Studies*, 17(4), 741-765. <https://doi.org/10.1108/JABS-09-2021-0360>
- Davcev, L., & Hourvoulides, N. (2013). Banking Concentration in FYROM: Evidence from a country in transition. *Procedia Economics and Finance*, 5, 222-230. [https://doi.org/10.1016/S2212-5671\(13\)00028-2](https://doi.org/10.1016/S2212-5671(13)00028-2)
- Demirguc-Kunt, A., & Levine, R. (2000). *Bank concentration: Cross-country evidence*. In *World Bank Global Policy Forum Working Paper*. Washington, DC, USA: The World Bank.
- Gambacorta, L., & Marques-Ibanez, D. (2011). The bank lending channel: Lessons from the crisis. *Economic Policy*, 26(66), 135-182. <https://doi.org/10.1111/j.1468-0327.2011.00261.x>
- Gulen, H., & Ion, M. (2016). Policy uncertainty and corporate investment. *The Review of Financial Studies*, 29(3), 523-564. <https://doi.org/10.1093/rfs/hhv050>
- Huynh, J. (2023). Is competition good or bad for the price, quantity, and quality of bank lending? *Plos One*, 18(8), e0287002. <https://doi.org/10.1371/journal.pone.0287002>
- Judge, G. G., Griffiths, W. E., Hill, R. C., Lütkepohl, H., & Lee, T. C. (1991). *The theory and practice of econometrics* (2nd ed.). New York: John Wiley & Sons.
- Klein, M. A. (1971). A theory of the banking firm. *Journal of Money, Credit and Banking*, 3(2), 205-218. <https://doi.org/10.2307/1991279>
- Lijesen, M. G., Nijkamp, P., & Rietveld, P. (2002). Measuring competition in civil aviation. *Journal of Air Transport Management*, 8(3), 189-197. [https://doi.org/10.1016/S0969-6997\(01\)00048-5](https://doi.org/10.1016/S0969-6997(01)00048-5)
- Molyneux, P., Casu, B., & Girardone, C. (2006). *Introduction to banking*. Harlow, England: Financial Times/Prentice Hall.
- Nguyen, M. N., Pham, H. M., Phan, A., Alam, A. W., & Tran, D. V. (2024). BHC brilliance in the fog of uncertainty: Illuminating trends in bank performance. *Journal of Economics and Finance*, 48(2), 437-461. <https://doi.org/10.1007/s12197-024-09664-z>
- Nguyen, T. P. T., & Nghiem, S. H. (2020). The effects of competition on efficiency: The Vietnamese banking industry experience. *The Singapore Economic Review*, 65(06), 1507-1536. <https://doi.org/10.1142/S0217590817500114>
- Nguyen, V. C. (2020). Trade liberalization, economic reforms and foreign direct investment—A critical analysis of the political transformation in Vietnam. *International Journal of Advanced Science and Technology*, 29(03), 6837-6850. <https://doi.org/10.31219/osf.io/ba2q9>
- Petersen, M. A., & Rajan, R. G. (1995). The effect of credit market competition on lending relationships. *The Quarterly Journal of Economics*, 110(2), 407-443. <https://doi.org/10.2307/2118445>
- Pham, M. H., & Nguyen, N. M. (2023). Bank funding diversity, risk and profitability: Evidence from Vietnam in the context of the COVID-19 pandemic. *Cogent Business & Management*, 10(1), 2191305. <https://doi.org/10.1080/23311975.2023.2191305>
- Tirole, J. (1988). *The theory of industrial organization*. Cambridge, MA: MIT Press.
- Tran, D. V. (2020). Funding liquidity and bank lending. *Cogent Economics & Finance*, 8(1), 1734324. <https://doi.org/10.1080/23322039.2020.1734324>
- Vo, X. V. (2018). Bank lending behavior in emerging markets. *Finance Research Letters*, 27, 129-134. <https://doi.org/10.1016/j.frl.2018.02.011>

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