



BANK SIZE AND FINANCIAL INTERMEDIATION OPERATIONS IN VIETNAM: A FOCUS ON THE DEPOSIT-LOAN NEXUS IN THE BANKING SECTOR

Le Hoang Vinh¹, Le Thi Thanh Huong^{2*}

¹Ho Chi Minh City University of Economics and Finance, Vietnam

²University of Finance - Marketing, Vietnam

*Corresponding author: Email: ncs20100908@sv.ufm.edu.vn

ARTICLE INFO	ABSTRACT
DOI: 10.52932/jfmr.v4i4ene.1199 <i>Received:</i> December 26, 2025 <i>Accepted:</i> May 31, 2026 <i>Published:</i> July 25, 2026 Keywords: Bank size, Customer Deposits, Customer Loans, Financial Intermediation Operations Article classification: Research paper JEL codes: G20, G21, G29	Purpose – This study examines the impact of bank size on financial intermediation, with a specific focus on the deposit-loan growth nexus within the Vietnamese banking sector. Furthermore, it evaluates the moderating role of bank size in shaping these operational dynamics. Design/ methodology/ approach – Utilizing panel data from 25 Vietnamese commercial banks over the 2010-2024 period, the research employs Generalized Least Squares (GLS) and Panel-Corrected Standard Errors (PCSE) to ensure robust estimation. Findings – The empirical findings reveal that while customer deposit growth independently exerts a significant positive impact on loan growth - aligning with classical financial intermediation theory - this relationship is fundamentally altered by the inclusion of bank size. Specifically, bank size acts as a crucial positive moderator, mitigating the negative pressures that may arise between deposit mobilization and credit expansion. Originality/ value – These results suggest that the efficiency of financial intermediation varies significantly across different bank size cohorts. Consequently, the study recommends that bank executives align deposit policies with institutional scale and suggests that the State Bank of Vietnam implement differentiated regulatory frameworks tailored to specific bank size categories to optimize credit growth and operational stability.

1. Introduction

Commercial banks serve as financial intermediaries between lenders and borrowers, or more broadly, between surplus and deficit entities. Their core functions involve mobilizing deposits and extending credit to customers (Cao, 2021; Matthews et al., 2023). Thakor and Boot (2008) emphasize that policymakers and researchers alike recognize the central role of commercial banks in integrating lending with deposit-taking. Compared with other financial intermediaries, commercial banks have an information advantage in mobilizing deposits, helping ensure borrowers maintain access to capital even during credit market shocks. Furthermore, banks provide essential liquidity to both depositors and borrowers, a function that reinforces the synergy between deposit and lending activities. While customer deposits supply liquidity to banks (Dahir et al., 2019), an increase in loans can constrain it, thereby incentivizing banks to enhance their deposit mobilization capabilities. Extensive empirical evidence confirms that deposit growth significantly and positively influences lending growth (Dang et al., 2021; Jessica & Chalid, 2019; Yasnur & Kurniasih, 2017; Awdeh, 2017; Ivanović, 2016).

According to Tutino et al. (2014), bank size introduced heterogeneity in loan growth, portfolio quality, and profitability during the financial crisis. Size can also be a key determinant of financial intermediation efficiency. Larger banks benefit from economies of scale through the efficient allocation of fixed costs across deposit and lending operations, while achieving superior diversification of loan portfolios (Demircuc-Kunt et al., 2004). Moreover, Wang (2015) asserts that bank profitability increases with scale due to enhanced competitiveness and specialization.

In the context of Vietnam, Nguyen and Huynh (2019) identified a positive relationship

between bank size and risk tolerance. This suggests that larger commercial banks, leveraging their advantages in deposit mobilization, are more inclined to accept risks when pursuing aggressive loan growth to generate higher returns. Similarly, Diep and Tu (2022) found that bank size contributes to profit stability and risk mitigation. Their study also revealed that while competition is positively associated with risk, this relationship is moderated by bank size; specifically, the impact is less pronounced for large-scale banks compared to their smaller counterparts.

Given the theoretical and empirical evidence above, this study investigates the moderating role of bank size on the impact of deposit growth on lending growth within the Vietnamese banking sector - a prominent emerging market. The remainder of this paper is organized into four sections: (i) literature review and hypothesis development; (ii) research methodology, data, and model specification; (iii) presentation and discussion of empirical results; and (iv) conclusions and policy implications.

2. Literature review and hypothesis development

2.1. Deposit-loan nexus in the banking sector

The fundamental role of commercial banks as financial intermediaries is rooted in the mitigation of information asymmetry. Drawing upon Akerlof (1970) pioneering work on adverse selection and moral hazard, Leland and Pyle (1977) emphasized that banks act as specialized agents in information production, facilitating efficient capital allocation between surplus and deficit entities. Complementing this view, Allen and Santomero (1997) asserted that financial intermediaries remain vital across both traditional and modern markets, where they not only mobilize household deposits but also perform a crucial monitoring function on behalf of depositors.

From a structural perspective, the relationship between deposits and lending is governed by the nature of market competition. While perfectly competitive models suggest that banks optimize loan and deposit volumes based on interest rate margins and marginal costs, imperfect competition models – supported by Freixas and Rochet (2008) and Matthews et al. (2023) – argue that lending is intrinsically constrained by deposits due to reserve requirements and liquidity mandates. Consequently, classical financial intermediation theory posits that deposit growth serves as a primary catalyst for credit expansion.

A substantial body of empirical literature underscores the significance of deposit mobilization for bank stability and credit growth. Mahmood et al. (2023) identified deposit growth as a critical determinant of lending capacity and overall institutional stability. This is further corroborated by Aziz and Maulida (2024), who found that in the Indonesian context, customer deposits are the primary funding source for credit extension, thereby directly supporting the financial intermediation function. Similarly, Gupta and Devi (2021) highlighted the positive influence of capital formation on loan growth.

In the specific context of Vietnam, Nguyen and Nguyen (2022) demonstrated that liquidity supplied via customer deposits significantly drives loan growth, noting that deposits and bank capital can act as substitutes to sustain lending activities. Technical analyses, such as the Lotka-Volterra model employed by Fadhlurrahman and Sumarti (2016), also confirm a positive correlation between these two variables. Furthermore, Awdeh (2017) provided evidence that both contemporaneous and lagged deposit growth are statistically significant predictors of private sector credit expansion. However, this relationship is not without constraints; as Chun and Ardaaragchaa

(2024) noted, factors such as non-performing loans can impair bank efficiency and compel institutions to restrict loan growth despite deposit availability.

Given the theoretical consensus on the intermediation function and the prevailing empirical evidence from both global and domestic markets, it is anticipated that deposit mobilization remains the bedrock of lending activities in the Vietnamese banking sector. Therefore, this study proposes the following hypothesis:

Hypothesis H1: Customer deposit growth exerts a significant positive impact on loan growth.

2.2. Bank size and financial intermediation operations

The impact of bank size on operational performance and credit expansion remains a subject of significant academic debate. From the perspective of economies of scale, larger financial institutions are often associated with cost efficiencies and superior financial performance. Empirical evidence from Kayani and Hakiman (2023) and Okwaro et al. (2024) confirms that bank size exerts a significant positive influence on profitability, typically proxied by return on assets. This is theoretically supported by the modern intermediation theory of Diamond (1984), which posits that larger intermediaries benefit from enhanced diversification, lower failure probabilities, and implicit government guarantees – such as “too big to fail” subsidies – which lower their marginal costs of funding.

Conversely, a competing body of literature highlights the existence of diseconomies of scale. Dahir et al. (2019) found a negative correlation between bank size and loan growth, while Banya and Biekpe (2018), Suroso and Mala (2024) argued that excessive size may lead to organizational rigidities, thereby diminishing efficiency and profitability. Interestingly,

Naseri et al. (2020) suggested a non-linear relationship, identifying an inverted U-shaped effect on profitability and a U-shaped effect on cost efficiency, implying that the advantages of scale may diminish beyond a certain threshold.

The capacity of a bank to transform deposits into loans is fundamentally constrained by its operational scale and market reputation. While small banks may not inherently destabilize the system (De Haan & Poghosyan, 2012), historical evidence from the US savings and loan crisis suggests that smaller institutions often face tighter financial constraints when executing growth strategies. Meral (2015) emphasized that small banks encounter greater challenges in mobilizing stable, long-term deposits compared to their larger counterparts - a factor critical for sustaining the bank lending channel.

Building on this, Suriawinata et al. (2023) provided evidence that bank size not only directly facilitates higher deposit volumes but also indirectly enhances net interest margins. Furthermore, Demircug-Kunt et al. (2004) argued that larger banks benefit from a lower cost of deposits and higher mobilization capacity, which together create greater opportunities for credit extension. Within this framework, bank size acts as a catalyst that strengthens the synergy between mobilization and lending activities.

Despite extensive research on the direct impacts of bank size, there remains a notable lacuna in the literature regarding its moderating role within the deposit-loan growth nexus. While the link between deposits and loans is well-established, the extent to which this relationship is amplified or attenuated by the bank's scale – particularly in the context of an emerging market like Vietnam – remains unexplored. This study addresses this gap by examining whether bank size serves as a critical boundary condition for financial intermediation efficiency.

Based on these theoretical and empirical foundations, the following hypotheses are proposed:

Hypothesis H2a: Bank size has a significant positive impact on loan growth.

Hypothesis H2b: Bank size positively moderates the financial intermediation nexus between deposits and loans, such that the impact of deposits on lending is stronger for larger banks.

3. Model specification and research methodology

3.1. Research model

To empirically test the proposed hypotheses, this paper employs two econometric specifications with loan growth (LG) as the primary dependent variable.

The first specification (Model 1) serves as the baseline model to examine Hypothesis H1, focusing on the direct impact of deposit growth (DG) on credit expansion. The second specification (Model 2) is designed to test Hypotheses H2a and H2b by incorporating bank size (SZ) as an independent regressor and an interaction term (DG×SZ). This interaction term is critical for capturing the potential moderating effect of organizational scale on the deposit-loan nexus.

To ensure the robustness of the estimations and mitigate omitted variable bias, the models include a comprehensive set of control variables (CONTROL). These include liquidity (LI), credit risk (CR), and management efficiency (ME), all of which are documented in the literature as key determinants of bank lending behavior. The operational definitions and measurement methodologies for all variables are detailed in Table 1.

Table 1. Variable Definitions and Measurements

Variable	Symbol	Definition and Measurement	Empirical research
Dependent variable			
Loan growth	LG	Annual change in total customer loans divided by the beginning balance of loans.	Dahir et al. (2019), Dang et al. (2021), Gupta and Devi (2021), Chun and Ardaaragchaa (2024), Aziz and Maulida (2024), Nguyen and Nguyen (2022)
Explanatory variables			
Deposit growth	DG	Annual change in total customer deposits divided by the beginning balance of deposits.	Aziz and Maulida (2024), Mahmood et al. (2023)
Bank size	SZ	The natural logarithm of total assets.	Gupta and Devi (2021), Mahmood et al. (2023), Nguyen and Nguyen (2022), Dahir et al. (2019), Dang et al. (2021)
Interaction Term	DGxSZ	Interaction term between Deposit Growth and Bank Size (multiplication of DG and SZ).	Authors' suggestion based on Baron and Kenny (1986)
Control variables			
Bank liquidity	LI	The ratio of liquid assets to total assets.	Dahir et al. (2019), Gupta and Devi (2021), Chun and Ardaaragchaa (2024)
Management efficiency	ME	The ratio of total operating costs to total average assets.	Nguyen and Nguyen (2022)
Credit risk	CR	Non-performing loan ratio: Non-performing loans divided by total customer loans.	Chun and Ardaaragchaa (2024), Aziz and Maulida (2024)

To empirically test the proposed hypotheses, we specify two panel data regression models. Let α represent the intercept, β and π denote the regression coefficients for the explanatory and control variables respectively, i signify the individual commercial bank ($i = 1, \dots, 25$), t denote the time period (2010, ..., 2024), and ε represent the idiosyncratic error term.

Model 1 is the baseline specification used to examine the direct impact of deposit growth on loan growth (Hypothesis H1), without the inclusion of the interaction effect:

$$LG_{i,t} = \alpha + \beta_1 DG_{i,t} + \sum_{j=1}^n \beta_j CONTROL_{j,i,t} + \varepsilon_{i,t} \quad (1)$$

Model 2 incorporates bank size and the interaction term between deposit growth and bank size to test the direct effect of scale (Hypothesis H2a) and its moderating role (Hypothesis H2b):

$$LG_{i,t} = \alpha + \beta_1 DG_{i,t} + \beta_2 SZ_{i,t} + \beta_3 (DG \times SZ)_{i,t} + \sum_{j=1}^n \beta_j CONTROL_{j,i,t} + \varepsilon_{i,t} \quad (2)$$

Where $CONTROL_{j,i,t}$ is a vector of bank-specific control variables, including liquidity (LI), management efficiency (ME), and credit risk (CR).

3.2. Data collection and sample selection

This study employs a purposive sampling technique to construct a balanced panel dataset, ensuring the continuity and statistical robustness of the observations. The final sample comprises 25 Vietnamese commercial banks observed over a 15-year period from 2010 to 2024, yielding a total of 375 bank-year observations.

The selection of the study period is strategically grounded. The year 2010 was established as the baseline to capture the Vietnamese banking sector's trajectory as it normalized and entered a phase of significant expansion following the 2008-2009 global financial crisis. The period extends to 2024 to incorporate the most recent financial data available, providing a contemporary perspective on the industry.

To be included in the final sample, banks were required to meet the following criteria:

- (i) Data Availability - The bank must maintain consistent financial records to allow for the measurement of all dependent, independent, and control variables throughout the entire 15-year timeframe.
- (ii) Audit Integrity - Financial statements must have been published annually and received an unqualified (clean) opinion from an independent auditing firm, ensuring the reliability of the secondary data.

A summary of the descriptive statistics for all variables utilized in the empirical models is presented in Table 2.

Table 2. Descriptive statistics of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
LG	375	0.2175	0.2768	-0.7038	4.2447
DG	375	0.2124	0.2696	-0.6630	2.8234
SZ	375	18.7200	1.2356	15.5695	21.6518
LI	375	0.1915	0.0776	0.0484	0.5727
ME	375	0.0177	0.0052	0.0075	0.0565
CR	375	0.0209	0.0198	0.0001	0.2428

Notes: LG = Loan growth; DG = Deposit growth; SZ = Bank size; LI = Liquidity; ME = Management efficiency; CR = Credit risk. All variables are defined in Table 1.

Source: Author's calculation

The descriptive statistics for the variables employed in the empirical models are summarized in Table 2. The dependent variable, loan growth (LG), exhibits significant variation, ranging from a minimum of -0.7038 to a maximum of 4.2447. The mean value of 0.2175 suggests an overall expansionary credit trend among Vietnamese commercial banks during the study period. This average growth rate is slightly lower than that observed in the

Indian banking sector (0.2268), as reported by Gupta and Devi (2021), yet notably surpasses the 0.162 growth rate recorded for Mongolian banks by Chun and Ardaaragchaa (2024).

Regarding deposit growth (DG), the sample mean of 0.2124, coupled with a standard deviation of 0.2696, indicates a robust capacity for capital mobilization from customers within the Vietnamese market. Comparatively, this

mobilization rate is higher than that of Iraqi banks (0.173) reported by Mahmood et al. (2023) and significantly exceeds the findings of Aziz and Maulida (2024) for the Indonesian banking sector (0.0285).

The bank size (SZ) variable, measured as the natural logarithm of total assets, yields an average of 18.72. This indicates that the operational scale of Vietnamese commercial banks is considerably larger than that of Italian banks (10.184) studied by Gupta and Devi (2021) but remains smaller than institutions in Iraq (26.58) (Mahmood et al., 2023) and the BRICS nations (20.3) (Dahir et al., 2019).

Finally, the control variables - Liquidity (LI), Management efficiency (ME), and Credit risk (CR) - provide additional insights into the banks' operational health, with mean values of 0.1915, 0.0177, and 0.0209, respectively. The consistent set of 375 observations across all variables ensures the statistical reliability of the subsequent econometric estimations.

3.3. Estimation Method

Following the framework proposed by Baltagi (2021), this study employs both fixed-effects (FE) and random-effects (RE) models for panel data analysis. The Hausman specification test was subsequently conducted to determine the most appropriate model between the two. Diagnostic tests revealed the presence of heteroskedasticity in the selected models; consequently, in accordance with Gujarati

(2021) and Baltagi (2021), the Generalized Least Squares (GLS) method was utilized to ensure efficient estimation. Furthermore, the Panel-Corrected Standard Errors (PCSE) approach was applied to verify the robustness of the results. A comparison between the GLS and PCSE estimates demonstrates consistency across models, indicating that the findings are robust and provide a reliable basis for the study's conclusions.

4. Findings and Discussions

4.1. Correlation and Multicollinearity Analysis

Table 3 presents the correlation matrix and Variance Inflation Factors (VIFs) for the studied variables. The results indicate a significant positive correlation between loan growth (LG) and deposit growth (DG), reflecting the core financial intermediation function of Vietnamese commercial banks. Conversely, a weak negative correlation is observed between loan growth (LG) and bank size (SZ); however, this relationship lacks statistical significance. This suggests that the impact of bank size should be evaluated in conjunction with other factors, potentially acting as a structural support for financial intermediation activities. Furthermore, following the diagnostic criteria proposed by Gujarati (2021), both the correlation coefficients and VIF values remain within acceptable thresholds, confirming that multicollinearity does not pose a significant threat to the validity of the regression results.

Table 3. Correlation coefficient matrix and VIFs

	LG	DG	SZ	LI	ME	CR
LG	1					
DG	0.7495***	1				
SZ	-0.0824	-0.1996***	1			
LI	0.0733	0.18***	-0.2275***	1		
ME	0.0505	0.0272	-0.2282***	-0.2474***	1	
CR	-0.0306	0.0203	-0.1081**	-0.0388	0.1205**	1
VIFs		1.0635	1.1963	1.1972	1.1807	1.0232

Notes: symbols *** $p < 0.01$; ** $p < 0.05$; LG = Loan growth; DG = Deposit growth; SZ = Bank size; LI = Liquidity; ME = Management efficiency; CR = Credit risk. All variables are defined in Table 1.

4.2. Regression Analysis and Discussions

Table 4 summarizes the estimation results derived from both fixed-effects (FE) and random-effects (RE) models. The Hausman specification test yielded p-values of 0.0521 for Model (1) and 0.0029 for Model (2). These statistical outcomes suggest that the RE model is more appropriate for Model (1), where

the interaction term between bank size and deposit growth is excluded. Conversely, for Model (2), the significant p-value indicates that the FE model is preferred upon the inclusion of the interaction variable. This shift in model selection underscores the sensitivity of the internal estimators to the inclusion of interactive structural components within the panel data framework.

Table 4. Regression results for FE and RE models

Variable	Model (1)		Model (2)	
	FE	RE	FE	RE
DG	0.7936*** [0.0392]	0.7907*** [0.0362]	-3.9886*** [0.5150]	-3.7322*** [0.4860]
SZ	0.0141 [0.0160]	0.0148* [0.0084]	-0.0632*** [0.0166]	-0.0404*** [0.0095]
DG.SZ			0.2637*** [0.0283]	0.2507*** [0.0269]
LI	-0.4165** [0.1654]	-0.1507 [0.1333]	-0.4730*** [0.1481]	-0.1649 [0.1193]
ME	0.2757 [2.5536]	2.1011 [1.9664]	-3.1816 [2.3156]	-0.7118 [1.7857]
CR	-0.6387 [0.5468]	-0.6357 [0.4820]	-0.3055 [0.4907]	-0.5541 [0.4315]
C	-0.1264 [0.3285]	-0.2217 [0.1819]	1.3695*** [0.3351]	0.8425*** [0.1988]
R-squared	0.5974	0.5720	0.6784	0.6534
Hausman test		10.9649 (0.0521)		19.9164 (0.0029)
Wald test for the residual regression		112.8602 (0.0000)	78.17846 (0.0000)	
Breusch-Pagan LM test		639.9808 (0.0000)		
Wald test			1300.9292 (0.0000)	

Notes: *** $p < 0,01$; ** $p < 0,05$; * $p < 0,1$; (...) p -value of tests; [...] standard error; LG = Loan growth; DG = Deposit growth; SZ = Bank size; LI = Liquidity; ME = Management efficiency; CR = Credit risk. All variables are defined in Table 1.

Following the model selection process, diagnostic tests for autocorrelation and heteroskedasticity were conducted. The Wald test results for residual autocorrelation yielded p-values of 0.4352 for Model (1) and 0.5597 for Model (2), indicating the absence of serial correlation. However, the Breusch-Pagan LM test for the RE model and the Wald test for the FE model both produced p-values of 0.0000, confirming the presence of heteroskedasticity. To address this, Generalized Least Squares (GLS) and Panel-Corrected Standard Errors (PCSE) estimations were employed. These robust methods provide the final empirical basis for testing the hypotheses outlined in Section 2.

Table 5 summarizes the regression results using GLS and PCSE. A comparative analysis of these estimates demonstrates that the identified relationships in both Model (1) and Model (2) are consistent and robust. Specifically, in Model (1), customer deposit growth exerts

a significant positive effect on loan growth, thereby supporting Hypothesis H1. This finding shows that deposit growth acts as a primary catalyst for credit expansion by providing the essential liquidity and funding capacity required for banks to fulfill their roles as financial intermediaries and drive loan growth. This relationship is theoretically grounded in financial intermediation and information asymmetry theories, which posit that banks mitigate market frictions to facilitate efficient capital allocation. Furthermore, the observed positive impact of deposits on lending aligns with the empirical evidence and theoretical assertions established by Aziz and Maulida (2024), Mahmood et al. (2023), and Nguyen and Nguyen (2022). These findings are also consistent with prior research by Gupta and Devi (2021), Awdeh (2017), and Fadhlurrahman and Sumarti (2016), collectively reinforcing the role of deposit mobilization as a primary driver of credit expansion.

Table 5. Regression results for GLS and PCSE models

Variable	Model (1)		Model (2)	
	GLS	PCSE	GLS	PCSE
DG	0.6509*** (0.0329)	0.7812*** (0.0676)	-1.4437*** (0.3608)	-3.7322*** (0.6131)
SZ			-0.0158** (0.0062)	-0.0404*** (0.0092)
DG.SZ			0.1158*** (0.0206)	0.2507*** (0.0352)
LI	-0.0289 (0.0701)	-0.2154 (0.1282)	-0.027 (0.0842)	-0.1649 (0.124)
ME	-0.2296 (1.126)	1.1152 (2.0549)	-0.5704 (1.5095)	-0.7118 (2.2178)
CR	-0.5963* (0.3423)	-0.7108* (0.4296)	-0.4925 (0.325)	-0.5541 (0.3812)
C	0.09*** (0.0267)	0.088* (0.0519)	0.3802*** (0.1364)	0.8425*** (0.2013)
R-squared	0.5205	0.5684	0.5341	0.6534

Notes: Symbols *** $p < 0,01$; ** $p < 0,05$; * $p < 0,1$; (...) standard error; LG = Loan growth; DG = Deposit growth; SZ = Bank size; LI = Liquidity; ME = Management efficiency; CR = Credit risk. All variables are defined in Table 1.

Interestingly, this relationship is altered in Model (2) upon the inclusion of bank size. The results in Table 5 reveal that bank size has a negative impact on loan growth, which contradicts Hypothesis H2a; this finding aligns with the research of Dahir et al. (2019), which highlights the adverse effects of institutional scale on the credit expansion capabilities of commercial banks. Furthermore, bank size acts as a positive moderator in the relationship between deposit and loan growth. Specifically, an increase in institutional scale mitigates the adverse effects of deposit fluctuations on credit expansion, thereby providing robust empirical support for Hypothesis H2b. This finding reinforces the critical role of bank size in enhancing the financial intermediation function, facilitating a more efficient transformation of deposits into loans - a mechanism previously highlighted by De Haan and Poghosyan (2012), Meral (2015), Suriawinata et al. (2023), and Demircuc-Kunt et al. (2004).

These above empirical results elucidate the operational dynamics of financial intermediation by analyzing the interplay between deposits and loans in Vietnam's banking system.

First, in the absence of moderating factors, customer deposit growth exerts a significant positive influence on loan growth. This finding underscores the specialized role of Vietnamese commercial banks as intermediaries that bridge the gap between depositors and borrowers, aligning with classical financial intermediation theory. As customer deposits constitute the primary capital source for lending activities, an expansion in the deposit base provides a direct incentive for banks to scale up their credit offerings to the market.

Second, while bank size independently shows a negative correlation with loan growth, its interaction with customer deposit growth significantly and positively affects credit

expansion. These findings can be elucidated through two primary perspectives:

Strategic focus on safety and capital costs: Smaller commercial banks often face structural constraints and limited credit growth opportunities. While deposit growth initially motivates lending expansion, exceeding certain thresholds may exert upward pressure on funding costs. Consequently, banks are compelled to prioritize capital management efficiency and operational safety. Such rising costs may lead to higher lending rates or more stringent credit conditions, ultimately decelerating loan growth.

Capital source diversification: Larger commercial banks leverage their established reputations and brand equity to proactively access diversified, low-cost funding channels beyond traditional customer deposits. This structural advantage explains why the direct dependence of loan growth on deposits may appear weaker in larger institutions; however, bank size serves as a crucial positive moderator, enhancing the efficiency with which mobilized capital is converted into loanable funds.

5. Conclusions and suggestions

5.1. Conclusions and suggestions

Utilizing a comprehensive dataset of 25 Vietnamese commercial banks spanning the 2010-2024 period, this study demonstrates that deposit growth exerts a significantly positive influence on loan expansion. However, this relationship is fundamentally altered when accounting for the interaction between bank size and deposit growth. Specifically, bank size acts as a critical positive moderator, mitigating the negative pressures that may arise between deposit mobilization and credit growth under certain conditions. These empirical findings suggest that the efficiency of financial intermediation in Vietnam varies

significantly across bank-size cohorts. Based on these results, several practical implications are proposed. First, bank executives should strategically align their deposit mobilization policies with their institution's scale to optimize loan growth trajectories. Second, the State Bank of Vietnam should consider implementing differentiated regulatory frameworks for financial intermediation that are tailored to specific bank size categories.

5.2. Limitations of the study

A key limitation is that this study models a strictly linear relationship between deposit and loan growth, assuming a uniform effect across all commercial banks. Hence, it overlooks potential non-linearities and heterogeneous behaviors across different bank size cohorts. Additionally, the study fails to establish the

critical size thresholds where this relationship exhibits structural breaks or trend reversals. To address these gaps, future empirical research should delve deeper into the non-linear dynamics between deposit and loan growth across various bank size quintiles, or pinpoint specific thresholds where a reversal of these dynamics occurs.

Funding Acknowledgment

This research received no specific grant from any funding agency.

Data Availability

Data available upon reasonable request (contact corresponding author).

AI Usage Statement

The authors declared no generative AI tools were used in research or writing.

References

- Akerlof, G. (1970). The market for lemons: Qualitative uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84, 488-500. <https://doi.org/10.4337/9781781950005>
- Allen, F., & Santomero, A. M. (1997). The theory of financial intermediation. *Journal of banking & finance*, 21(11-12), 1461-1485. [https://doi.org/10.1016/S0378-4266\(97\)00032-0](https://doi.org/10.1016/S0378-4266(97)00032-0)
- Awdeh, A. (2017). The determinants of credit growth in Lebanon. *International Business Research*, 10(2), 9-19. <https://doi.org/10.5539/IBR.V10N2P9>
- Aziz, A., & Maulida, S. (2024). Bank Credit Growth in Indonesia During the Covid-19 Pandemic and Its Regulations. *Journal of Central Banking Law and Institutions*, 3(1), 177-202. <https://doi.org/10.21098/jcli.v3i1.47>
- Baltagi, B. H. (2021). *Econometric Analysis of Panel Data*. Springer.
- Banya, R., & Biekpe, N. (2018). Banking efficiency and its determinants in selected frontier african markets. *Economic Change and Restructuring*, 51(1), 69-95. <https://doi.org/10.1007/s10644-016-9200-3>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Cao, J. (2021). *The Economics of Banking*. Routledge.
- Chun, S. H., & Ardaaragchaa, N. (2024). Analysis of Factors Affecting the Loan Growth of Banks with a Focus on Non-Performing Loans. *Journal of Risk and Financial Management*, 17(5), 203 (1-9). <https://doi.org/10.3390/jrfm17050203>
- Dahir, A., Mahat, F., Razak, N. H., & Bany-Arifin, A. N. (2019). Capital, funding liquidity, and bank lending in emerging economies: An application of the LSDVC approach. *Borsa Istanbul Review*, 19(2), 139-148. <https://doi.org/10.1016/j.bir.2018.08.002>
- Dang, V. D., Le, T. T. H., Le, D. H., & Nguyen, H. D. H. (2021). Bank capital and lending behavior of Vietnamese commercial banks. *The Journal of Asian Finance, Economics and Business*, 8(2), 373-385. <https://doi.org/10.13106/jafeb.2021.vol8.no2.0373>

- De Haan, J., & Poghosyan, T. (2012). Size and earnings volatility of US bank holding companies. *Journal of Banking & Finance*, 36(11), 3008-3016. <https://doi.org/10.1016/j.jbankfin.2012.07.008>
- Demirguc-Kunt, A., Laeven, L., and Levine, R. (2004). Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation. *Journal of Money, Credit, and Banking*, 36, 593-622. <https://doi.org/10.1353/mcb.2004.0045>
- Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The Review of Economic Studies*, 51(3), 393-414. <https://doi.org/10.2307/2297430>
- Diep, T. H., & Tu, P. T. (2022). Vai trò của quy mô trong mối quan hệ giữa cạnh tranh và rủi ro của các ngân hàng thương mại Việt Nam. [Role of Asset Size in Relation between Competitions and Risks of Vietnamese Commercial Banks]. *Tạp chí khoa học Yersin*, 12(8/2022), 20-36.
- Fadhilurrahman, A., & Sumarti, N. (2016, April). Implementation of the dynamical system of the deposit and loan growth based on the Lotka-Volterra model and the improved model. In *AIP Conference Proceedings*, 1723(1). AIP Publishing. <https://doi.org/10.1063/1.4945065>
- Freixas, X., & Rochet, J. C. (2008). *Microeconomics of Banking*. The MIT Press.
- Gujarati, D. N. (2021). *Essentials of econometrics*. Sage Publications.
- Gupta, S., & Devi, L. (2021). Empirical Analysis of Capital, Funding Liquidity and Bank Lending in Emerging Market Economies: An Application of System GMM Approach. *Administrative Development: A Journal of HIPA Shimla*, 8(SI-1), 247-270. <https://doi.org/10.53338/ADHIPA2021.V08.Si01.15>
- Ivanović, M. (2016). Determinants of credit growth: The case of Montenegro. *Journal of Central Banking Theory and Practice*, 5(2), 101-118. <https://doi.org/10.1515/jcbtp-2016-0013>
- Jessica, T., & Chalid, D. A. (2019). Determinants of Bank Loan in Indonesia. *Advances in Social Science, Education and Humanities Research*, 558, 505-512. <https://doi.org/10.2991/assehr.k.210531.064>
- Kayani, I., & Hakiman, H. (2023). Determinants of Bank Performance through Camel Ratio, Digitalization, and Bank Size. *Devotion: Journal of Research and Community Service*, 4(10), 1938-1948. <https://doi.org/10.59188/devotion.v4i10.573>
- Leland, H. E., & Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation. *The Journal of Finance*, 32(2), 371-387. <https://doi.org/10.2307/2326770>
- Mahmood, Z. M., Al-Aboudi, A. A. K., & Hamzah, M. H. (2023). Determinants of loan growth and its impact on banking stability: An applied study in a sample of commercial banks listed in the Iraq Stock Exchange for the period (2005-2020). *Warith Scientific Journal*, 5(14), 38-52.
- Matthews, K., Thompson, J., & Zhang, T. (2023). *The Economics of Banking*. World Scientific Publishing Co.
- Meral, G. (2015). The effect of bank size and bank capital on the bank lending channel for Turkish banks. *American Scientific Research Journal for Engineering, Technology, and Sciences*, 12(1), 1-28.
- Naseri, M., Bacha, O. I., & Masih, M. (2020). Too small to succeed versus too big to fail: how much does size matter in banking? *Emerging Markets Finance and Trade*, 56(1), 164-187. <https://doi.org/10.1080/1540496X.2019.1612359>
- Nguyen, T. L. H., & Huynh, H. T. (2019). Mối quan hệ giữa quy mô, đòn bẩy tài chính và mức độ chấp nhận rủi ro của các ngân hàng thương mại Việt Nam. [The relationship between size, financial leverage and risk tolerance of Vietnamese commercial banks]. *Tạp chí Phát triển và Hội nhập*, 46(56), 30-38.
- Nguyen, Y., & Nguyen, L. (2022). Funding liquidity, bank capital, and lending growth in a developing country. *Cogent Economics & Finance*, 10(1), 2122958. <https://doi.org/10.1080/23322039.2022.2122958>
- Okwaro, A., Chelogoi, S., & Kapkiyai, C. (2024). Does Size Matter? Portfolio Diversification and Financial Performance of Commercial Banks in Kenya: Testing the Moderating Effect of Bank Size. *Journal of Business, Economics and Management Research Studies*, 2(2), 45-63. <https://doi.org/10.69897/jobemrs.v2i2.119>
- Suriawinata, I. S., Prastuti, D., & Hermastuti, P. (2023). Banks' Core Deposits and Net Interest Margin: Do Size and Ownership Structure Matter? *Jurnal Keuangan dan Perbankan*, 27(3), 360-372. <http://dx.doi.org/10.26905/jkdp.v27i3.9642>
- Suroso, S., & Mala, C. M. F. (2024). The strength of competition and market efficiency in Determining bank profits. *Risk Governance and Control: Financial Markets & Institutions*, 14(3), 8-17. <https://doi.org/10.22495/rgcv14i3p1>
- Thakor, A. V., & Boot, A. (2008). *Handbook of Financial Intermediation and Banking*. Elsevier Science.

- Tutino, F., Colasimone, C., Brugnoli, G. C., & Riccetti, L. (2014). Intermediation Model, Bank Size and Lending to Customers: Is There a Significant Relationship? Evidence from Italy: 2008–2011. In *Governance, Regulation and Bank Stability* (pg. 201-241). Palgrave Macmillan. https://doi.org/10.1057/9781137413543_10
- Wang, T. (2015). Competition and increasing returns to scale: A model of bank size. *The Economic Journal*, 125(585), 989-1014. <https://doi.org/10.1111/eoj.12104>
- Yasnur, M., & Kurniasih, A. (2017). Factors affecting bank lending growth: Cases in Indonesia. *International Journal of Scientific and Research Publications*, 7(11), 69-76.