IRJEMS International Research Journal of Economics and Management Studies
ISSN: 2583 – 5238 / Volume 5 Issue 3 March 2026 / Pg. No: 52-57
Paper Id: IRJEMS-V5I3P108, Doi: 10.56472/25835238/IRJEMS-V5I3P108

Original Article

Bank Profitability in Vietnam: Heterogeneous Effects across Large and Small Banks

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Received Date: 12 February 2026 Revised Date: 05 March 2026 Accepted Date: 08 March 2026 Published Date: 10 March 2026

Abstract: *This study investigates bank profitability in Vietnam using quarterly panel data on 29 commercial banks from 2024Q1 to 2025Q4. A bank fixed effects model with bank clustered standard errors is employed to evaluate the relationship between quarterly return on assets and factors such as bank size, loan intensity, deposit funding, credit risk, cost efficiency, capitalization, and income diversification. For the full sample, loan intensity and non-interest income share are positively associated with profitability. Subsample analysis reveals substantial heterogeneity across banks. Among large banks, credit risk, cost efficiency, capitalization, and non-interest income are significantly associated with profitability, whereas among small banks, only loan intensity remains significant. These results offer recent evidence from quarterly data and indicate that short-run profitability dynamics vary across different groups of banks within the Vietnamese banking sector.*

Keywords: *Bank Profitability, ROA, Vietnam, Fixed Effects, Credit Risk, Income Diversification.*

I. INTRODUCTION

Bank profitability matters for financial stability, credit allocation, and economic growth (Xu et al., 2019). In Vietnam, where the financial system remains strongly bank-based, the performance of commercial banks affects the flow of funds to firms and households, as well as the resilience of the broader financial system. Since the mid-2010s, Vietnamese banks have faced rapid credit expansion, pressure to strengthen asset quality, intensifying competition, and ongoing adjustments to Basel-oriented regulatory standards. However, Vietnamese banks are not homogeneous. Differences in bank structure lead to different profitability patterns and cause the determinants of profitability to vary across bank groups. Against this background, examining short-run profitability not only helps identify the bank-specific factors associated with profitability but also reveals whether these relationships differ systematically between large and small banks. This is important for both bank managers and policymakers.

Although the international literature on bank profitability is well established (e.g., Athanasoglou et al., 2008; Petria et al., 2015), evidence from Vietnam remains relatively limited on whether the determinants of profitability differ systematically across bank types (Ngo and Phung, 2024; Nguyen and Nguyen, 2024; Tiep et al., 2022). Much of the existing literature estimates average effects for the full sample, implicitly treating banks as broadly homogeneous units. However, differences in bank structure suggest that the factors associated with profitability may vary across banks. This study addresses that gap by examining bank profitability in Vietnam through both full-sample estimation and sub-sample analysis, with the sample divided into large and small banks to identify heterogeneous profitability patterns across bank groups.

The paper examines within-bank relationships between profitability and a set of widely used bank-specific variables, including size, loan intensity, deposit funding, credit risk, cost efficiency, capitalization, and income diversification. The results show substantial heterogeneity in profitability patterns across bank groups. In the full sample, loan intensity and the non-interest income (NONII) share are positively associated with quarterly ROA (return on assets), although only at marginal significance levels. In the large-bank subsample, non-performing loans (NPL), cost-to-income ratio (CIR), equity-to-assets ratio (EQTA), and non-interest income (NONII) significantly affect bank profitability, and the within-R2 increases markedly. In contrast, in the small-bank subsample, only loan intensity remains statistically significant.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 describes the data and methodology. Section 4 presents the empirical results. Section 5 concludes with policy implications.

II. LITERATURE REVIEW

Research on bank profitability usually distinguishes between internal bank-specific factors and external macroeconomic conditions (Athanasoglou et al., 2008; Ngo and Phung, 2024; Nguyen and Nguyen, 2024; Petria et al., 2015; Tiep et al., 2022). Because the present sample spans only eight quarters, the analysis focuses on bank-specific correlates and interprets the results as short-run within-bank relationships rather than a full structural model of profitability.

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Non-performing loans (NPLs) are among the most widely studied drivers of bank performance. A higher level of NPLs typically requires banks to allocate more provisions, reduce effective interest income, and raise the costs of monitoring troubled borrowers, collateral management, and debt recovery. Consistent with this view, empirical studies report a negative relationship between NPLs and bank performance (Qehaja-Keka et al., 2023).

Cost efficiency is a widely examined determinant of bank performance, typically measured by the cost-to-income ratio (CIR). The CIR indicates how effectively a bank converts operating costs into income; a higher CIR signals weaker cost management and reduced operational efficiency. When operating expenses increase faster than income, profitability declines because a larger share of revenue is consumed by administrative and overhead costs. In contrast, banks that maintain tighter cost control and operational efficiency are generally better positioned to achieve stronger financial outcomes. Previous studies also frequently report a negative association between the cost-to-income ratio and bank profitability (Dietrich and Wanzenried, 2011)

Bank size is also frequently examined in the profitability literature, although its expected effect is not always unambiguous(Berger et al., 1987; Goddard et al., 2004a; Pasiouras and Kosmidou, 2007). Pasiouras and Kosmidou (2007) find that bank size is positively and significantly related to profitability, attributable to greater diversification opportunities and potential economies of scale enjoyed by larger banks. However, Berger et al. (1987) show that the cost savings associated with larger scale may be modest, while very large banks may even suffer from scale inefficiencies. Therefore, the overall effect of size on profitability cannot be assumed to be uniformly positive.

Capitalization, often measured by the equity-to-total-assets ratio, is another important bank-specific factor associated with profitability (Athanasoglou et al., 2008). Prior studies report mixed evidence on the role of capitalization in explaining bank profitability. On the one hand, a lower capital ratio may indicate a riskier financial position, which would imply a negative relationship between capitalization and profitability (Berger and N, 1995). On the other hand, higher equity levels may reduce the cost of capital and lower the expected costs of financial distress, including bankruptcy, thereby supporting profitability (Athanasoglou et al., 2008; Goddard et al., 2004b). Moreover, Athanasoglou et al. (2005) suggest that capital is better modelled as an endogenous determinant of bank profitability, since higher profits may increase capital.

Income diversification, commonly captured by the share of non-interest income, has also received substantial attention in the bank profitability literature. Empirical studies from the United States and Europe suggest that greater reliance on non-interest income is often associated with weaker risk-return tradeoffs, higher earnings volatility, or higher bank risk, especially depending on the composition of that income and the type of bank involved (DeYoung and Rice, 2004; Lepetit et al., 2008)

For Vietnam, empirical evidence remains relatively limited and largely based on annual bank-level data. This study contributes more recent quarterly evidence and, more importantly, explicitly classifies banks into large and small groups in order to examine whether the correlates of profitability differ across bank types.

III. DATA AND METHODOLOGY

A) Data

The dataset is compiled from quarterly financial statements of Vietnamese commercial banks over the period 2024Q1-2025Q4. Observations with missing core financial information are excluded, as are those lacking key variables, such as Non-Performing Loans (NPLs). The final dataset used for estimation consists of bank-quarter observations with complete information for all variables.

The dependent variable is quarterly ROA, defined as net profit divided by total assets. The baseline specification includes seven bank-specific regressors: SIZE as the logarithm of total assets; LOAN as loans to total assets; DEP as deposits to total assets; NPL as non-performing loans to total loans; CIR as operating expenses to operating income; EQTA as equity to total assets; and NONII as non-interest income to total operating income. All variables except SIZE are winsorized at the 1st and 99th percentiles to reduce the influence of extreme observations.

Table 1: Variable Definitions

Variables	Definition	Unit
ROA	Net Profit / Total Assets (quarterly)	Ratio
SIZE	ln(Total Assets)	Log VND
LOAN	Loans / Total Assets	Ratio
DEP	Deposits / Total Assets	Ratio
NPL	Non-Performing Loans / Total Loans	Ratio
CIR	Operating Expenses / Operating Income	Ratio
EQTA	Equity / Total Assets	Ratio

NONII	Non-Interest Income / Operating Income	Ratio

Table 2: Variables Description

Variables	N	Mean	Std. Dev.	Min	Median	Max
ROA	230	0.0031	0.0020	−0.0030	0.0032	0.0071
SIZE	230	33.455	1.140	31.089	33.404	35.742
LOAN	230	0.6427	0.0662	0.4459	0.6545	0.7492
DEP	230	0.6238	0.1294	0.0871	0.6352	0.8301
NPL	222	0.0301	0.0394	0.0071	0.0241	0.3593
CIR	230	0.6657	0.7553	−3.0935	0.5578	2.7976
EQTA	230	0.0888	0.0309	0.0423	0.0842	0.1725
NONII	230	0.3654	0.3845	−1.0844	0.3110	1.9582

B) Methodology

The baseline specification is:

$$ROA_{it} = \alpha_i + \beta_1 SIZE_{it} + \beta_2 LOAN_{it} + \beta_3 DEP_{it} + \beta_4 NPL_{it} + \beta_5 CIR_{it} + \beta_6 EQTA_{it} + \beta_7 NONII_{it} + \varepsilon_{it} \quad (1)$$

Where α_i denotes bank-specific fixed effects and ε_{it} is the idiosyncratic error. Standard errors are clustered at the bank level throughout. The preferred estimator is the bank fixed-effects (FE) estimator, which eliminates time-invariant unobserved heterogeneity correlated with the regressors. An F-test for the joint significance of bank fixed effects strongly rejects poolability ($p < 0.001$), confirming the appropriateness of the FE specification over pooled OLS. Three alternative estimators are also reported for comparison: pooled OLS with heteroskedasticity-robust standard errors, random effects (RE), and a two-way FE model adding time fixed effects.

To examine whether the determinants of profitability differ by bank size, the full sample is divided into two subsamples based on a size split. Bank size is proxied by total assets, and the sample median of total assets is used as the cutoff point. Banks with total assets above the median are classified as large banks, while those below the median are classified as small banks. The baseline regression model is then estimated separately for each subsample, allowing for a direct comparison of the magnitude and significance of profitability determinants across large and small banks.

IV. RESULTS AND DISCUSSION

Table 3 reports the baseline regression results. The preferred specification is Column (3), the bank fixed effects model with bank-clustered standard errors. In the full sample, LOAN and NONII are the only variables that reach marginal statistical significance. The remaining variables have theoretically plausible signs but are not precisely estimated in the bank fixed-effects model.

Table 3: Baseline Regression Results - Dependent Variable: ROA (Quarterly)

Variables	(1) Pooled OLS	(2) Random Effects	(3) Bank FE	(4) Two-Way FE
SIZE	0.0008***	0.0006***	-0.0008	0.0004
	(0.000)	(0.003)	(0.588)	(0.873)
LOAN	-0.0007	0.0053**	0.0073*	0.0080
	(0.728)	(0.040)	(0.098)	(0.150)
DEP	-0.0014	-0.0003	-0.0004	-0.0012
	(0.201)	(0.854)	(0.932)	(0.819)
NPL	-0.0069**	-0.0040	-0.0045	-0.0034
	(0.047)	(0.377)	(0.277)	(0.333)
CIR	0.0001	-0.0000	-0.0002	-0.0002
	(0.847)	(0.988)	(0.687)	(0.645)
EQTA	0.0247***	0.0236***	0.0074	0.0102
	(0.000)	(0.001)	(0.795)	(0.762)
NONII	0.0002	0.0011*	0.0017*	0.0017*
	(0.598)	(0.050)	(0.067)	(0.078)
N	222	222	222	222
R^2	0.476	0.121 (overall)	0.144 (within)	0.124 (within)
Bank FE	No	No	Yes	Yes
Time FE	No	No	No	Yes
SE	Robust	Robust	Clustered (bank)	Clustered (bank)

*Note: p-values in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Pooled OLS uses heteroskedasticity-robust standard errors; RE uses robust standard errors. Bank FE and Two-Way FE use standard errors clustered at the bank level.*

Table 3 presents the baseline results for quarterly ROA across four specifications. Overall, the results are broadly consistent with the existing literature on bank profitability. SIZE and EQTA are positive and highly significant in pooled OLS and RE (e.g., SIZE ≈ 0.0006–0.0008; EQTA ≈ 0.023–0.025), but both lose significance in the fixed-effects models. This indicates that their effects are primarily driven by cross-sectional differences across banks, rather than by within-bank variation over time (Athanasoglou et al., 2008; Goddard et al., 2004b). In contrast, LOAN shows a positive effect in the panel specifications, reaching significance in RE and marginal significance in Bank FE (coefficients around 0.005–0.008). This suggests that higher lending intensity may support bank profitability. NONII is the most consistent variable across specifications, with a positive and marginally significant coefficient in RE, Bank FE, and Two-Way FE (around 0.0011–0.0017). This provides some evidence that greater reliance on non-interest income is associated with higher profitability, consistent with the view that income diversification may support profitability (DeYoung and Rice, 2004; Lepetit et al., 2008). Overall, the results indicate that loan intensity and income diversification are the variables showing some robustness in explaining within-bank variation in profitability, whereas size and capitalization effects are largely cross-sectional.

Table 4: Regression Results Large Banks

Variables	(1) Pooled OLS	(2) Random Effects	(3) Bank FE	(4) Two-Way FE
SIZE	−0.0010***	−0.0013***	−0.0008	0.0027
	(0.000)	(0.000)	(0.407)	(0.434)
LOAN	−0.0055*	−0.0034	−0.0051	−0.0031
	(0.082)	(0.301)	(0.364)	(0.623)
DEP	0.0076***	0.0072***	0.0071	0.0064
	(0.002)	(0.007)	(0.183)	(0.225)
NPL	−0.0767***	−0.1303***	−0.1623***	−0.1572***
	(0.004)	(0.000)	(0.000)	(0.000)
CIR	−0.0032***	−0.0035***	−0.0038***	−0.0037***
	(0.000)	(0.000)	(0.000)	(0.000)
EQTA	0.0280***	0.0286***	0.0464**	0.0551*
	(0.000)	(0.000)	(0.034)	(0.054)
NONII	0.0014**	0.0018***	0.0014**	0.0013*
	(0.023)	(0.002)	(0.033)	(0.065)
N	119	119	119	119
R^2	0.558	0.552 (overall)	0.596 (within)	0.435 (within)
Bank FE	No	No	Yes	Yes
Time FE	No	No	No	Yes
SE	Robust	Robust	Clustered (bank)	Clustered (bank)

*Note: p-values in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Large banks defined as average SIZE ≥ sample median; 15 banks: ACB, BID, CTG, HDB, LPB, MBB, MSB, SHB, SSB, STB, TCB, TPB, VCB, VIB, VPB.*

For large banks (Table 4), the within-R^2 reaches 0.596, and four variables are statistically significant in the preferred Bank Fixed Effects (FE) model: NPL (−0.1623, $p < 0.001$), CIR (−0.0038, $p < 0.001$), EQTA (+0.0464, $p = 0.034$), and NONII (+0.0014, $p = 0.033$). The magnitude of the NPL coefficient is substantially larger than the full-sample estimate (−0.0045), which reflects the heavy provisioning burden and stricter credit risk monitoring among systemically important banks. CIR is also highly significant, confirming that cost discipline serves as the primary profitability lever for large banks operating in competitive funding markets. EQTA is positively associated with profitability, consistent with the notion that better-capitalized large banks face lower funding costs and enjoy higher market confidence. Notably, NONII is significant in the large-bank FE model but not in the full sample, indicating that the benefits of income diversification are concentrated among banks with sufficient scale to develop fee-based revenue streams.

Table 5: Regression Results Small Banks

Variables	(1) Pooled OLS	(2) Random Effects	(3) Bank FE	(4) Two-Way FE
SIZE	0.0009***	0.0008	0.0013	−0.0004
	(0.003)	(0.101)	(0.701)	(0.931)
LOAN	0.0091***	0.0103***	0.0109**	0.0108**
	(0.002)	(0.003)	(0.036)	(0.037)

DEP	−0.0018*	−0.0019	−0.0018	−0.0036
	(0.065)	(0.219)	(0.676)	(0.499)
NPL	−0.0046*	−0.0007	0.0032	0.0021
	(0.083)	(0.869)	(0.647)	(0.788)
CIR	−0.0001	−0.0000	0.0000	−0.0001
	(0.763)	(0.932)	(0.992)	(0.791)
EQTA	0.0078	0.0100	0.0201	0.0149
	(0.295)	(0.321)	(0.673)	(0.781)
NONII	0.0013*	0.0014**	0.0015	0.0018
	(0.050)	(0.048)	(0.237)	(0.155)
N	103	103	103	103
R^2	0.406	0.266 (overall)	0.204 (within)	0.188 (within)
Bank FE	No	No	Yes	Yes
Time FE	No	No	No	Yes
SE	Robust	Robust	Clustered (bank)	Clustered (bank)

Note: *p-values in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Small banks are defined as average SIZE < sample median; 14 banks: BAB, BVB, BaoVietBank, EIB, EVF, KLB, NAB, NVB, OCB, PGB, PVcomBank, SGB, VAB, VBB.*

For small banks (Table 5), only LOAN is statistically significant in the preferred Bank FE model (+0.0109, p = 0.036), with a within-R^2 of 0.204. The positive effect of loan intensity for small banks indicates a greater dependence on traditional lending as the primary, and often sole, source of earnings. Conventional risk and efficiency variables (NPL, CIR, EQTA) are not significant, suggesting that small bank profitability is influenced by more idiosyncratic factors, such as local market positioning, customer relationships, or product mix, none of which are captured in this standardised framework. The comparison between pooled OLS (R^2 = 0.406) and Bank FE (R^2 = 0.204) further demonstrates that cross-sectional size differences, rather than within-bank dynamics, account for most of the explanatory power in the small-bank sample.

V. CONCLUSION

This paper provides quarterly panel evidence on the determinants of commercial bank profitability in Vietnam. It uses data for 29 banks over 2024Q1–2025Q4. The main contributions are threefold. First, using within-bank variation with a fixed-effects estimator, the study identifies loan intensity and income diversification as positive determinants of short-run bank profitability. A higher share of loans in total assets, reflecting active deployment of earning assets and a diversified income base, both support quarterly ROA. Second, the study documents a strong heterogeneity effect across bank size groups. Credit risk, measured by non-performing loans (NPL), and cost efficiency, captured by the cost-to-income ratio (CIR), are highly significant determinants for large banks (R^2 = 0.571) but statistically absent for small banks (R^2 = 0.199). This divergence cautions against treating Vietnam's commercial banking sector as homogeneous: the profitability drivers differ fundamentally between the systemically important large banks and the smaller regional lenders. Third, by employing quarterly rather than annual data, the study captures short-run within-bank dynamics. These dynamics are smoothed away in annual studies. The relatively flat aggregate ROA trend masks within-quarter cross-bank variation that warrants monitoring.

Policy and managerial implications: For large Vietnamese banks, the results suggest that maintaining disciplined credit standards and controlling operational costs are the primary levers for profitability management. For small banks, the absence of significant conventional determinants implies that profitability is shaped by more idiosyncratic factors such as local market positioning, customer relationships, or product mix that are difficult to capture in a standard framework.

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