

Determinants of Vietnamese Commercial Bank Profitability: The Moderating Role of Bank Size

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Abstract

This study is an attempt to examine the determinants of Vietnamese commercial bank profitability under the moderating role of bank size. It uses the balanced panel data of 25 Vietnamese commercial banks in the period 2009-2021 and applies several regression estimation techniques such as FEM, REM, FGLS and PCSE. The results find evidence to support diseconomies of scale in Vietnam banking system, the positive impact of credit risk, bank capital, liquidity, and loan volume and the negative effect of cost ratio on bank profitability. Especially, our study confirmed the moderating role of bank size on all important internal variables at a significant level. The bank size can restrain the positive impact on profitability of some bank-specific factors such as credit risk, bank capital, loan volume but it can also lighten the harmful effect of several factors such as liquidity and cost ratio. The findings have some important policy and management implications. The study is also relevant to different stakeholders in maintaining a sound and efficient banking system.

1. Introduction

Frequently, profitability is the primary goal of the firm (Van Horne & Wachowicz, 2008). Discovering key factors to drive profitability is the topic that always attract attention from managers, shareholders and even government. Specifically in the case of Vietnam, Batten and Vo (2019) used a data sample of 35 commercial banks for the period of 2006-2014 and discovered the determinants of profitability. They are bank specific factors (including bank productivity, operating cost, bank capital, size, and risk), bank industry characteristics, and macroeconomic factors. Similarly, many studies, such Koroleva et al. (2021), Al-Mosharrafa and Islam (2021),

Zerihun (2021), Almaskati (2022), Vong and Chan (2009), have tried to find the determinants of bank profitability. However, Samad et al. (2006) confirmed that there exists a significant difference in profitability between small and medium-sized banks, and between medium-sized and large banks. Bikker et al. (2006) used the extended Panzar-Rosse model for a sample of more than 18,000 banks in 101 countries and concluded that large banks have significantly superior market power compared to small banks. Onour et al. (2019) discovered that large banks have increasing profits with scale, thereby confirming that the competitive advantage in operating activities belongs to large-scale banks. Asongu and Odhiambo (2019) concluded that bank size increases in-

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terest rate margins in an inverted-U shape. The above information suggests that bank size can create differences in bank-specific factors in operating operations, leading to differences in the profitability of commercial banks. Accordingly, our research question in this article is “Does bank size play a moderating role in the influence of bank-specific factors on Vietnamese bank profitability?”. Our findings are expected to provide useful and relevant information for bank managers in implementing profit goals and provide evidence to develop relevant theories.

In addition to the mentioned introduction, our article includes the following 4 sections as follows. Section 2 presents literature review and develops hypotheses. Section 3 provides information about the research sample and data, followed by the research model and estimation method. Section 4 analyzes the research results and discusses the relationships identified from our findings. The final section concludes the research problem and provides relevant recommendations.

2. Literature review and hypothesis

The theory of economies of scale as proposed by Stigler (1958) implies that an increase in bank size is an opportunity to save costs, and thereby contribute to increasing bank profits. Almaskati (2022), Al-Shatnawi et al. (2021), Derbali (2021), Farkasdi et al. (2021), Jeris (2021), Koroleva et al. (2021) confirmed that bank size has a positive impact on profitability. On the contrary, the too-big-to-fail hypothesis recommends that commercial banks need to control their size, because they can fail on a large scale due to not being able to control the additional risk, leading to a negative impact on profitability (Stern & Feldman, 2004). Accordingly, empirical research by Al-Mosharrafa and Islam (2021), Farooq et al. (2021), O’Connell (2022) and Zerihun (2021) supported that bank size negatively affects bank profitability.

The positive relationship between size and bank profitability can be explained that market power increases if bank size is larger (Bikker et al.,

2006), or the bank’s probability of default is low thanks to its scale (Krasa & Villamil, 1992). In the case of large-size banks, their competitive advantage is higher thanks to the ability to diversify, the ease of implementing business expansion and better customer service quality. These contribute to reducing risk and increasing the opportunity to improve profitability. Accordingly, we hypothesize for the case of commercial banks in Vietnam as follows:

Hypothesis H1: Bank size positively affects profitability.

Berger and DeYoung (1997) introduced the “Bad Luck” Theory and the “Bad Management” Theory. These two theories show that credit risk has a negative impact on bank profitability. The increase in credit risk requires commercial banks to make more provisions, which increases costs and reduces profitability. Horobet et al. (2021), Jilenga and Luanda (2021), Koroleva et al. (2021), Pires et al. (2021) and Viciwati (2021) concluded the opposite relationship between credit risk fluctuations and changes in banks’ profitability. However, commercial banks often agree to grant credit if they are confident about their customers’ ability to manage credit risks. This principle supports the relationship of the positive impact of credit risk on profitability. Similar conclusions have been confirmed by empirical research by Almaskati (2022), Al-Jafari et al. (2021), Al-Mosharrafa and Islam (2021). Commercial banks often attract deposits from customers with excess capital, and then provide credit to customers with capital shortages. This inevitably leads to banks facing credit risks, whereby profitability is expected to increase according to the principle of trade-off between risk and return. However, large commercial banks can receive support from the Government if they encounter financial difficulties (Distinguin et al., 2013). This mentality of dependence can lead to large banks not paying attention to risk management measures. Therefore, the positive relationship between credit risk and profitability may be reduced by bank size. Accordingly, we set up a research hypothesis for the case of commercial banks in

Vietnam as follows:

Hypothesis H2a: Credit risk positively affects profitability.

Hypothesis H2b: Bank size moderates the positive impact of credit risk on profitability.

According to the Agency Theory proposed by Jensen và Meckling (1976), an increase in bank capital will help them improve their financial capacity to ensure capital safety and increase depositors' trust. This contributes to increasing opportunities for commercial banks to mobilize capital at lower interest rates, and thus increase profitability. Besides, higher bank capital is an opportunity for them to expand operating and investing activities for profit-making purposes. Vong and Chan (2009) argued that commercial banks with more equity will have superior safety, and this advantage can be converted into higher profitability. O'Connell (2022), Almaskati (2022), Al-Jafari et al. (2021), Derbali (2021), Farkasdi et al. (2021), Farooq et al. (2021), Hakuduwal (2021) and Jeris (2021) provided empirical evidence that bank capital has a positive impact on banks' profitability. Meanwhile, Al-Mosharrafa and Islam (2021) and Derbali (2021) provided the opposite evidence. In addition, Rahman et al. (2015) pointed out that large commercial banks hold lower capital and higher risk levels. Ünvan and Yakubu (2020) emphasized that bank size is an essential factor to attract customer deposits. Thus, larger banks have more opportunities to mobilize deposits more easily and accordingly equity may decrease. We hypothesize as follows:

Hypothesis H3a: Bank capital positively affects profitability.

Hypothesis H3b: Bank size moderates the positive impact of bank capital on profitability.

Commercial banks, as a financial intermediary, must simultaneously ensure liquidity and profitability (Nure, 2019). Malik et al. (2016) recommended that bank managers need to evaluate and restructure their liquidity management strategies; because this not only increases asset utilization efficiency but also improves bank profitability. O'Connell (2022), Almaskati (2022), Koroleva et al. (2021), Kryeziu and

Hoxha (2021), Pires et al. (2021) found a positive impact of liquidity on the bank profitability. Meanwhile, Aspal et al. (2019), Al-Mosharrafa and Islam (2021), Farooq et al. (2021) and Shafee et al. (2021) reach the opposite conclusion. In addition, signaling theory suggests that larger banks will have more advantages in business operations, thereby improving liquidity (Spence, 1973). Niu (2021) confirmed that bank size has a positive relationship with liquidity creation on the asset side, but inversely with liquidity creation on the liability side. Thus, bank size can play an additional moderating role in the impact of liquidity on profitability at commercial banks. Accordingly, we suggest the following research hypothesis:

Hypothesis H4a: Bank liquidity has a positive impact on profitability.

Hypothesis H4b: Bank size moderates the positive impact of liquidity on profitability.

Vong and Chan (2009) identified customer loans are one of the important profitable assets. According to the theory of financial intermediation shows that the more deposits converted into loans, the profitability increases (Pyle, 1971). Jayaraman et al. (2021) and Hakuduwal (2021) concluded that an increase in loan size has a positive impact on bank profitability. However, Vong and Chan (2009) recommended that, instead of paying attention to loan size, the important factor for commercial banks' profitability is the interest rate spread and the quality of the loan. In addition, these authors also asserted that small banks achieve a higher average return on assets than large banks. Accordingly, we set up a hypothesis for the case of commercial banks in Vietnam as follows:

Hypothesis H5a: Loan volume has a positive impact on profitability.

Hypothesis H5b: Bank size moderates the positive impact of loan volume on profitability.

The efficient-structure theory includes the X-efficiency and scale-efficiency hypotheses (Berger, 1995). The X-efficiency hypothesis argues that banks with better management and operational activities will contribute to controlling costs and increasing profitability (Berger, 1995; Mensi & Zouari, 2010). Aspal et al.

(2019), Al-Jafari et al. (2021), Al-Mosharrafa and Islam (2021), Rahman and Shaon (2021), Jilenga and Luanda (2021), Viciwati (2021) found a significant positive impact of cost management efficiency on bank profitability. Besides, the scale-efficiency hypothesis shows that some commercial banks achieve better scale of operating activities, therefore lower costs. This leads to higher profitability and faster growth for the scale-efficient banks (Mensi & Zouari, 2010; Berger, 1995). Thus, bank size can play a moderating role to increase the positive impact of cost management efficiency on profitability at commercial banks. With this evidence, we establish the following research hypothesis:

Hypothesis H6a: Cost management efficiency has a positive impact on profitability.

Hypothesis H6b: Bank size moderates the positive impact of management efficiency on profitability.

3. Methodological aspects

3.1. Estimated model

The general model to be estimated is of the following linear form:

$$PROF_{i,t} = \sigma + \beta_1 BS_{i,t} + \beta_2 RISK_{i,t} + \beta_3 EQU_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 LOAN_{i,t} + \beta_6 CEFF_{i,t} + \beta_7 (RISK.BS)_{i,t} + \beta_8 (EQU.BS)_{i,t} + \beta_9 (LIQ.BS)_{i,t} + \beta_{10} (LOAN.BS)_{i,t} + \beta_{11} (CEFF.BS)_{i,t} + \varepsilon_{i,t}$$

Where *i* and *t* denote bank and time in years, respectively; σ is the constant; β is the regression coefficient; ε is the disturbance term; $PROF_{i,t}$ is the dependent variable which is the proxy of profitability of bank *i* at year *t*. Variable measures and expected effect sign are summarized in Table 1.

3.2. Data

The study uses secondary panel data extracted from audited financial statements and annual reports of Vietnamese banks stretching from 2009 to 2021. The analyzed sample has 25 Vietnamese commercial banks that hold together approximately 75% of the whole banking system's asset. We chose to analyze only the commercial banks because most of the credit institutions in Vietnam are belong to this category. Moreover, we have

Table 1. Definition of variables

Variables	Description	Measurement	Expected effect	Empirical evidence
PROF	Dependent variable- Bank profitability (in %)	(Net profits)/(Average total equity) ⁻¹		
BS	Independent variable (IV)- Bank size	Natural logarithm of asset	+	Almaskati (2022), Al-Shatnawi et al. (2021), Derbali (2021), Farkasdi et al. (2021), Jeris (2021), Koroleva et al. (2021)
RISK	IV- Credit risk, measured by NPLs which include sub-standard debts (group 3), doubtful debts (group 4) and potentially irrecoverable debts (group 5)	(NPLs)/(Total outstanding loans) ⁻¹	-	Horobet et al. (2021), Jilenga and Luanda (2021), Koroleva et al. (2021), Pires et al. (2021), Viciwati (2021)
EQU	IV- Bank capital	(Total equity)/(Total asset) ⁻¹	+	O'Connell (2022), Almaskati (2022), Al-Jafari et al. (2021), Derbali (2021), Farkasdi et al. (2021), Farooq et al. (2021), Hakuduwal (2021), Jeris (2021)

Variables	Description	Measurement	Expected effect	Empirical evidence
LIQ	IV- Liquidity	(Outstanding loans) (Deposits) ⁻¹	+	O'Connell (2022), Almaskati (2022), Koroleva et al. (2021), Kryeziu and Hoxha (2021), Pires et al. (2021)
LOAN	IV- Loan volume	(Outstanding loans) (Total asset) ⁻¹	+	Jayaraman et al. (2021), Hakuduwal (2021)
CEFF	IV- Cost management efficiency	(Operating costs) (Average total asset) ⁻¹	+	Aspal et al. (2019), Al-Jafari et al. (2021), Al-Mosharrafa and Islam (2021), Rahman and Shaon (2021), Jilenga and Luanda (2021), Viciwati (2021)
RISK.BS	IV- Interaction between bank size and credit risk	The product of RISK variable and BS variable	-	Authors' suggestion
EQU.BS	IV- Interaction between bank size and capital (equity)	The product of EQU varialbe and BS variable	+	Authors' suggestion
LIQ.BS	IV- Interaction between bank size and liquidity	The product of LIQ varialbe and BS variable	+	Authors' suggestion
LOAN. BS	IV- Interaction between bank size and loan volume	The product of LOAN varialbe and BS variable	+	Authors' suggestion
CEFF.BS	IV- Interaction between bank size and cost control efficiency	The product of CEFF varialbe and BS variable	+	Authors' suggestion

Source: Authors' compilation

chosen only commercial banks that have available information all the years between 2009 and 2021 to have a balanced panel dataset. The period of 2009- 2021 is selected partly due to availability of data, and it also addresses a time of restructuring and digitization of the banking sector, right after the financial crisis 2008.

Based on the raw data collected as mentioned above, we measured the variables according to Table 1. After that, we sequentially deployed the analysis content, including the descriptive statistics, the correlation coefficient matrix, variance inflation factor (VIF), and regression analysis.

3.3. Estimation method

To analyze how bank-specific important factors affect profitability under the mediating role of bank size, we employ standard estimation techniques for panel data in the analysis. In the first step, we use the standard procedure to estimate the equation with fixed effects (FEM) and random effects (REM). Then Hausman tests are conducted to select between FEM and REM. The results of the Hausman tests suggest that the FEM is more appropriate to use since p-value is less than 5 per cent. In the next step, we derive tests for detecting autocorrelation with the Wooldridge test and heteroskedasticity with the Wald test after fixed effects estimation of linear panel models. We conduct lagged

Table 2. Descriptive analysis

Variables	Mean	Maximum	Minimum	Std. Dev.	Observations
PROF	0.1128	0.3033	-0.5633	0.0840	325
BS	7.9914	9.2147	6.5236	0.5381	325
RISK	0.0206	0.0658	0.0000	0.0105	325
EQU	0.0975	0.3236	0.0411	0.0449	325
LIQ	0.8932	2.0271	0.3956	0.1944	325
LOAN	0.5579	0.8259	0.1942	0.1284	325
CEFF	0.0180	0.0565	0.0075	0.0054	325

Source: Authors' calculation

Table 3. Correlation matrix among variables and VIF test

	PROF	BS	RISK	EQU	LIQ	LOAN	CEFF
PROF	1.0000						
BS	0.4222***	1.0000					
RISK	-0.2797***	-0.1753***	1.0000				
EQU	-0.2100***	-0.5703***	0.1554***	1.0000			
LIQ	0.2160***	-0.0661ns	-0.1020*	0.3033***	1.0000		
LOAN	0.1723***	0.3046***	-0.0760ns	-0.0856ns	0.5560***	1.0000	
CEFF	-0.0709ns	-0.1683***	0.1528***	0.3147***	0.1592***	0.1150**	1.0000
VIF		2.0603	1.0762	2.2251	1.8072	1.7823	1.1533

Note: *, **, *** indicates significance at the 10%, 5%, and 1% respectively
^{ns} indicates statistically non-significant.

Source: Authors' calculation

residual processes at lag 1 and the estimated coefficient from the Wooldridge test is 0.4969, implying the null hypothesis is rejected in favor of the alternative hypothesis. In addition, the Wald test on the residual regression results as shown in Table 5 confirms rejection of the null hypothesis. In other words, the model presents a serial correlation of first order and heteroscedastic. Hence, we apply Feasible Generalized Least Squares (FGLS) estimator as a remedial measure. Concurrently, Panel-Corrected Standard Errors (PCSE) is utilized for further robust results to ensure the consistency of the research model. We organized the research data in Excel, and then analyzed them by using Eviews 12.

4. Findings and Discussions

Table 2 summarizes the descriptive statistics of

employed variables including the means, minimum, maximum, and standard deviations. As can be seen from this table, PROF has a wide range of variation with the value fluctuating from -56.33% to 30.33% and takes the average amount of 11.28%. Credit risk, which is measured by non-performing loan ratio (RISK) and cost control efficiency (CEFF) variables have the lowest fluctuation. Contrastingly, liquidity (LIQ) and loan volume (LOAN) are variables having the highest fluctuation. The loans-to-deposits ratio reaches its highest value at 202.71%, drops to its lowest value at 39.56% and has the average amount of 89.32%. Similarly, the loans-to-assets ratio fluctuates from 19.42% to 82.59% and has an average value of 55.79%.

Table 3 reports the correlation coefficient matrix between bank profitability and bank-specific

Table 4. Regression results

Independent variables	Dependent variable: PROF			
	FEM	REM	FGLS	PCSE
BS	-0.1130** [0.0570]	-0.0260ns [0.0510]	-0.1283*** [0.0493]	-0.1130* [0.0597]
RISK	13.1710** [5.3033]	9.7990* [5.0639]	10.6001** [4.7721]	13.1710** [5.2983]
EQU	8.8852*** [1.6646]	7.9411*** [1.5376]	7.6292*** [1.5484]	8.8852*** [1.7069]
LIQ	-1.6814*** [0.3556]	-1.2645*** [0.3194]	-1.5139*** [0.3013]	-1.6814*** [0.3273]
LOAN	1.7632*** [0.6333]	2.1588*** [0.5715]	1.0818** [0.5380]	1.7632*** [0.6529]
CEFF	-92.3314*** [11.6793]	-96.8919*** [10.9122]	-70.3382*** [10.9057]	-92.3314*** [12.4986]
RISK.BS	-1.8181*** [0.6715]	-1.4245** [0.6409]	-1.4913** [0.5988]	-1.8181*** [0.6601]
EQU.BS	-1.1754*** [0.2202]	-1.0274*** [0.2027]	-1.0329*** [0.2053]	-1.1754*** [0.2258]
LIQ.BS	0.2356*** [0.0461]	0.1787*** [0.0412]	0.2144*** [0.0386]	0.2356*** [0.0420]
LOAN.BS	-0.2300*** [0.0803]	-0.2859*** [0.0730]	-0.1449** [0.0679]	-0.2300*** [0.0824]
CEFF.BS	11.2754*** [1.4899]	11.9758*** [1.3828]	8.7486*** [1.3552]	11.2754*** [1.5450]
C	0.9868** [0.4469]	0.3197ns [0.4001]	1.0884*** [0.3872]	0.9868** [0.4712]
R-squared	0.6065	0.4176	0.6745	0.6065
Hausman Test		28.1724 (0.0030)		
Wald Test	1547.595 (0.0000)			

Note: *, **, *** indicates significance at the 10%, 5%, and 1% respectively; ns indicates statistically non-significant

Source: Authors' calculation

ic factors for the dataset. The correlation values are less than 0.8 and all variables of interest do not have high VIF suggestions. Thus, there is

no significant concern of multi-collinearity. In the next section, we present the regression results of the relationship between bank

Table 5. Wald Test from residual regression result

Test Statistic	Value	df	Probability
t-statistic	20.0488	274	0.0000
F-statistic	401.9555	(1, 274)	0.0000
Chi-square	401.9555	1	0.0000

Source: Authors' calculation

specific factors and bank profitability. Results of the regression analyses are shown in Table 4 and Table 5 shows the result of Wald test from residual regression.

In general, all selected bank-specific variables are proved to have statistically significant impact on bank profitability in all model estimates though impact signs are quite different from our expectation. First, regarding the influence of bank size (BS), different from the prior findings and interpretations, we find that bank size maintains a significantly negative correlation at the acceptable thresholds. This finding is still in accordance with the results obtained by Al-Mosharrafa and Islam (2021), Farooq et al. (2021), O’Connell (2022), Zerihun (2021), Batten and Vo (2019). It suggests that Vietnamese banks address diseconomies of scale because of several reasons. One of the reasons is that most of Vietnamese commercial banks are still small and private banks compared to few giant state-owned banks. These small banks are easy to manage, and they are forced to perform more efficiently to survive under competitive pressure and restructuring requirements since the financial crisis of 2008. Vietnamese banks must adapt to Basel II until 2021, thus small banks need to be more active in raising profitability to meet this standard. Meanwhile, large Vietnamese banks having taken full advantage of their scale may become bulky and not be able to control costs and resources, leading to the diseconomies of scale. Besides, as mentioned in ‘too big to fail’ hypothesis, giant state-owned banks in Vietnam may involve in long-term risky and lending projects under government nominations. They may expand their branches and diversify their products and activities without proper caution and result in less efficient performance. Another reason

attributing to the adverse relationship between bank size and profitability is the issue of high information asymmetry in Vietnam (Huynh et al., 2020) that make the initial cost of product development, diversification, and branch expansion extremely high. Thus, the expected economies of scale may not present in Vietnam.

In respect of the credit risk-profitability link, the coefficient is statistically significant at 5% significance level in FEM, FGLS and PCSE estimates. Far from our expectation, the sign shows a positive relationship with bank profitability, implying that banks with a high credit risk – expressed by high NPLs ratio may generate high profits. This finding is consistent with several similar studies’ results (Al-Mosharrafa & Islam, 2021; Almaskati, 2022, Al-Jafari et al., 2021) but incompatible with many studies conducted in both developed and developing countries (Horobet et al., 2021; Jilenga & Luanda, 2021; Koroleva et al., 2021; Pires et al., 2021; Viciwati, 2021). It is noted that the positive relationship may not exist in the long run, especially in the economic downturn period, increased exposure to credit risk finally leads to the failure of banks to recognize impaired assets and create reserves for writing off these assets (Barren & Vo, 2019). And if the impact of credit risk is considered under the interaction of bank size, the results indicate that the positive effect of credit risk in large banks tends to be suppressed compared with small banks. This is because large and bulky banks, as mentioned above, may not control related cost when increasing lending (Barros et al., 2007).

Regarding the impact of bank capital, the coefficient of the equity-to-asset is positive and significant at 1% significance level in all

regressions, as expected. This finding is similar to our initial expectation and the results of O'Connell (2022), Almaskati (2022), Al-Jafari et al. (2021), Derbali (2021), Farkasdi et al. (2021), Farooq et al. (2021), Hakuduwal (2021) and Jeris (2021) which suggest that well-capitalized banks are best-performing banks. Banks with more equity or solid capital structure may have a safety net as well as resources to bear losses and to dismiss the insolvency risk during unstable and difficult periods. However, the interactive variable $EQU*BS$ has a negative impact on dependent variables, indicating that the positive effect of bank capital in large banks may be restrained. A reasonable explanation for this may be the problem of agency cost and weak governance in large banks in comparison with small ones in Vietnam. In addition, large well-capitalized banks may tend to invest in risky assets, which in turn increase the NPLs and lower their profits. As for the relationship between liquidity and bank profitability, different from our expectation, the coefficient of loans-to-deposits ratio is negative and significant at 1% significance level in all equations. It suggests that an increase in the loans-to-deposit ratio implies low liquidity which then results in a decrease in bank profitability. The positive impact of liquidity on bank profitability is supported by lots of empirical studies such as O'Connell (2022), Almaskati (2022), Koroleva et al. (2021), Kryeziu and Hoxha (2021), Pires et al. (2021). However, under the mediation of bank size, the coefficient of interaction variable is positive, implying that large banks with high loans-to-deposits (low liquidity) can obtain high profits. It is likely that large banks may have more opportunities to expand credit to risky projects and increase their interest margins with a risk premium to compensate for possible default risk. This is in line with "too big to fail" problem when big banks with a dependent psychology try to exploit the implicit guarantee offered by the government and expose themselves to higher risk- higher return activities.

Concerning the effect of loan volume, the variable $LOAN$ shows a significantly positive

relationship with $PROF$ at 1% significance level. This reveals that Vietnamese commercial banks have been conventionally obtaining higher profits from interest they earn by boosting lending. This result is following other scholars such as Jayaraman et al. (2021) and Hakuduwal (2021). Nonetheless, some authors argue that large banks which expand credit activities without having ability to control and governance issues might make bad loans increase and thus reduce profitability (Vong & Chan, 2009). Especially large state-owned banks in Vietnam often participate in lending big inefficient project under government nomination. This explains why the interaction variable $LOAN*BS$ has a negative effect on bank profitability.

Finally, with reference to the impact of cost management efficiency, in all profitability equations, the estimated coefficient shows a negative association between operating cost-to-asset ratio and bank profitability at 1% significance level. Poor cost management quality should be translated to low profitability. This finding is in agreement with the results of Aspal et al. (2019), Al-Jafari et al. (2021), Al-Mosharrafa and Islam (2021), Rahman and Shaon (2021), Jilenga and Luanda (2021) and Viciwati (2021). However, the harmful effect of poor cost management in large banks tends to be slighter than in small banks since the interactive variable $CEFF*BS$ has a positive sign. This can be explained by the advantages that large banks may exploit such as bargaining power on loan rates, diversification of products and activities to gain profit in spite of high cost-ratio.

5. Conclusions

Previous literature provides mixed results of the impact of bank-specific factors on profitability and therefore draws attention towards this topic. Our study contributes by using an updated and extensive panel data set of Vietnamese commercial banks during restructuring process since the financial crisis 2008 in order to study bank profitability and internal factors under the moderating role of bank size.

In brief, main internal determinants of Vietnamese commercial bank profitability are bank size, credit risk, bank capital, liquidity, loan volume and cost management efficiency. We found the evidence of diseconomies of scale in Vietnam banking system, the positive impact of credit risk, bank capital, liquidity, and loan volume and the negative effect of cost ratio on bank profitability. Especially, our study confirmed the moderating role of bank size on all important internal variables at a significant level. The bank size can restrain the positive impact on profitability of some bank-specific factors such as credit risk, bank capital, loan volume but it can also lighten the harmful effect of several factors such as liquidity and cost ratio. The findings suggest that Vietnam-

ese commercial banks should be cautious in capital raising plans, expanding their branches, diversifying products and activities to utilize the economies of scale instead of suffering diseconomies of scale. The increase in size needs to be considered at the same time as credit risk and liquidity risk management, lending expansion as well as cost management.

This study also has potential limitations. First, our study focused only on some directly important internal bank-specific factors. Future research may consider incorporating other variables such as corporate governance or macro economic factors. Second, further studies may also consider examining determinants of bank profitability under the moderating role of firm size across countries. ■

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