

Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2022.vol9.no6.0023

The Impact of Capital Requirement on Bank Performance: Empirical Evidence from Vietnamese Commercial Banks

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Received: March 10, 2022 Revised: May 21, 2022 Accepted: May 30, 2022

Abstract

This paper examines the effects of regulatory capital on a bank's profitability and risk. We employ annual data from Vietnamese commercial banks from 2005 to 2020 and use the dynamic GMM regression method to address the potential endogeneity issue, more suitable for panel data with relatively low time dimensions. Our panel regressions indicate that higher regulatory capital would significantly improve the bank's profitability and lower the bank risks. In particular, a one percent increase in the regulatory capital would significantly increase the bank's return on assets by 1.9%. We further explore the heterogeneous impacts of regulatory capital on the Vietnamese bank's performance across bank characteristics. We find that smaller, non-state-owned and non-listed banks would benefit from stringent regulatory capital requirements. The improvements in bank performance are mainly driven by reductions in the risk premium of the banks, resulting in lower funding costs and higher profitability. These findings are essential since Vietnam, as an emerging market, has only implemented the Basel II reform recently on a stable and fast-growing background rather than as a reaction to the global financial crisis. Thus, our empirical results support stringent regulatory capital in emerging countries to ensure a stable banking sector and boost economic growth.

Keywords: Financial Institutions, Emerging Market, Bank Regulation

JEL Classification Code: C23, G21, G28

1. Introduction

The 2007–2008 Global Financial Crisis (GFC) has revealed numerous banks with inadequate capital levels relative to their risk exposures. Consequently, it triggers global regulatory reforms, with the introduction of the new Basel agreements (BCBS, 2010) to substantially increase the regulatory capital requirements, supervision, and risk management. The Basel reforms, however, also led to a debate about the impacts of the strengthened capital requirements on

the financial institutions. On the one hand, higher regulatory capital would make the bank safer by reducing the bank's risk-taking activities (Agoraki et al., 2011) and improving the bank's loss-absorbing capacity, which helps reduce the bank default probabilities (Gambacorta & Mistrulli, 2004). Higher regulatory capital also helps increase bank profitability due to better access to funding markets with relatively lower costs (Noss & Toffano, 2016; Fang et al., 2020). On the other hand, several researchers are concerned that higher capital requirements would impose higher regulatory costs on the bank, thus, hampering the bank's profitability (Fidrmuc & Lind 2019). The capital requirements may also reduce banks' franchise values and encourage gambling and eventually increase the bank risks (Hellmann et al., 2000).

In this study, we employ a unique dataset comprising 26 Vietnamese commercial banks from 2005 to 2020. Vietnam offers an interesting case study for two reasons. First, most of the previous literature has focused on the relationship between capital requirements and the banks' performance in advanced economies. This is due to the fact that these countries have well-developed banking sectors which have experienced several regulatory reforms. Vietnam, as an

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emerging market, has only been gradually imposing higher capital requirements and regulatory frameworks on the banking sector in recent years. Basel I was only introduced to the Vietnamese banking sector in 2010, followed by a recent reform in the banking regulation to strengthen the bank capital requirement and risk management to the Basel II standard. Thus, Vietnam implements higher capital requirements during a period of stable economic growth rather than a policy response to a period of sluggish and uncertain economic growth as in advanced economies. Therefore, using data from the Vietnamese banking system might provide additional empirical evidence to the debate on the impacts of capital requirements on the banks' performance. Second, Vietnam has a bank-based financial structure, with the banking sector contributing significantly to economic development. The country has also undergone significant financial liberalization, which significantly transforms the banking sector landscape and competition. Therefore, banking regulation plays an important role in promoting economic development since instability in the banking sector would lead to costly output and welfare losses. Interestingly, the recent regulatory reform has led to significant transitions in the Vietnamese commercial banks with the significantly higher capital requirement, creating scope to observe the impacts of regulatory capital on bank performance.

The rest of the paper is structured as follows: Section 2 reviews the existing literature and proposes the hypothesis. The data and methodology are highlighted in Section 3. Section 4 presents the empirical findings. The final section concludes the findings and relevant policy implications.

2. Literature Review

Our paper relates to the literature on the impacts of regulatory capital requirements on the bank's performance. So far, the empirical studies have generated mixed results. Several papers do not find the risk-reduction effects of tighter banking regulation or regulatory capital (Berger & Udell, 1994; Blum, 1999). In particular, Hovakimian and Kane (2000) argued that more stringent capital requirements would reduce the banks' charter value. Thus, it creates moral hazard incentives for the banks to engage in risky activities. The regulatory capital requirement also leads to an increase in the bank's systemic risk. Using a quasi-natural experiment in European banks, Bostandzic et al. (2021) found that systemic risk exposures increase in response to higher capital requirements. Since the bank faces a transition capital shortfall, they actively rebalance their portfolios, resulting in more correlated bank assets and a higher probability of risk contagion. Thus, it increases the systemic risk of bank returns and the Value-at-Risk of banks.

Nevertheless, the majority of literature supports the view that higher regulatory capital would help reduce bank risks. Furlong and Keely (1989) provided early evidence suggesting that increased capital requirement would help reduce the bank risks due to better risk-based bank activities. Bolt and Tieman (2004) argued that higher regulatory capital leads to stricter bank credit policy because of the regulatory cost, thus reducing banks' vulnerability to credit risks. Repullo (2004) further highlighted that bank tends to reduce their investments in risky assets to protect their franchise values under strict banking regulation. Agoraki et al. (2011) and Klomp and De Haan (2014) supported this result and find that increased bank capital requirements significantly reduce banks' excessive risk-taking behaviors and their overall risk level. More recently, Rahman et al. (2020) showed that higher capitalized banks make an effort to reduce credit risk and promote financial stability. This result is in line with Isnurhadi et al. (2021), who investigated the relationship between bank capital, efficiency, and risks in Islamic banks.

Another strand of the literature studies the impacts of regulatory capital on a bank's profitability. Yet, the results are also inconclusive. Theoretically, when the regulator hikes the capital requirement, it reduces the banks' profitability since it is more costly for banks to finance risky assets with higher returns (Aikman et al., 2015). The stricter capital requirement also led to a transitional shortfall in bank capital, forcing the bank to narrow down its loan portfolio and subsequently lower profitability (Fidrmuc & Lind 2020). Similarly, Hersugondo et al. (2020) and Dao and Nguyen (2020) showed that capital adequacy has a significant negative impact on bank performance in the case of Indonesian and Vietnamese commercial banks, respectively. Fang et al. (2020), however, argued that this reaction is short-lived and becomes insignificant in about half a year. Moreover, higher regulatory capital would enhance the banks' creditability to the investors by lowering the leverage and bankruptcy risk. Such improvements help banks to obtain lower funding costs, thereby increasing profitability.

The impacts of regulatory capital on bank performance also vary with the bank characteristics. A large part of the extant literature explores the interactions between a bank's characteristics and performance. Previous studies tend to agree that bank size, business models, corporate governance, and ownerships are significant determinants of a bank's profitability and risks (see, e.g., Laeven & Levine, 2009; Laeven et al., 2016). Bank characteristics could also drive the impacts of capital requirements on the bank's performance. For example, Danisman and Demirel (2019) showed that the effects of capital requirements are more effective in reducing bank risks for banks with more market power. Aikman et al. (2015) further highlighted that macroprudential capital requirements in preventing bank risk-taking behaviors

depend on the bank’s corporate governance and strategic independence. Fang et al. (2020) concluded that the impact of capital requirements is stronger during periods of lower economic growth, with weaker banks reacting more to changes in capital requirements.

Using dynamic Generalized Method of Moments (GMM) to control for endogeneity, our analysis was carried out for 26 commercial banks in Vietnam from 2005 to 2019, covering the recent two regulatory reforms in Vietnam with the implementation of Basel I and Basel II agreements. This study aims at two research questions:

Question 1: *What are the impacts of regulatory capital on the Vietnamese bank’s performance, as proxied by their profitability and stability?*

Question 2: *Whether regulatory capital has heterogeneous impacts on the Vietnamese bank’s performance across the bank’s characteristics?*

3. Data and Method

3.1. Data

Our empirical analysis comprises 26 Vietnamese commercial banks from 2005 to 2020. Data are collected from the S&P CapitalIQ database. The data sample and timeframe of the study are determined by the availability of data. Nevertheless, the total asset of the banks in the data sample accounts for approximately 86% of the Vietnamese banking sector’s total assets as of 2020. The list of banks is presented in Appendix 1.

3.2. Methodology

We employ a panel approach to evaluate the impacts of regulatory capital on the bank performance with the baseline regression as follows:

$$\text{bankperform}_{it} = \alpha + \beta_1 \text{bankperform}_{i,t-1} + \beta_2 \text{regcap}_{i,t-1} + \beta' X_{i,t-1} + \varepsilon_{it} \quad (1)$$

where, bankperform_{it} is the dependent variable for the performance of bank i in year t . In this study, we proxy the bank performance by their profitability and risk. For the profitability, we use the standard return on asset (ROA) ratio as calculated by the ratio of net income over total assets, similar to Fang et al. (2020) and De Jonghe et al. (2020). For the bank risk, we use the bank’s Z-score, which measures insolvency risk and is widely used in the literature (Laeven & Levine 2009; Yakubu & Bunyaminu 2021), calculated as:

$$Z - \text{score}_{it} = \frac{\text{ROA}_{it} + \text{ETA}_{it}}{\sigma(\text{ROA}_{it})} \quad (2)$$

where, ROA_{it} and ETA_{it} are the bank’s ROA and the equity to asset ratio, respectively. $\sigma(\text{ROA}_{it})$ is the deviation of ROA which is calculated in a rolling window of 3 years. Z-score measures the bank’s buffers (capitalization and returns) with uncertainty in the bank returns, and a higher Z-score implies a less risky bank. To control for Z-score skewness, we use the natural logarithm of $(1 + \text{Z-score}_{it})$, similar to Wu et al. (2020). The lagged dependent variables are also included as explanatory variables to account for the persistence of the bank’s profitability and risks.

regcap_{it} is the main independent variable of interest, which is measured as the bank regulatory capital to their risk-weighted assets. It is the capital that the bank is required to maintain for risk-taking purposes as mandated by the regulator. $X_{i,t-1}$ is a set of standard bank-specific control variables for the bank performance. All bank-specific variables are lagged one period to allow for the timely impacts of regulatory capital and changes in the bank’s characteristics on the bank performance.

We first consider bank size, measured by the logarithm of the total asset (TA_{it}), similar to Laeven et al. (2016) and Fang et al. (2020). Next, we include a proxy for the bank’s liquidity, measured by the ratio of liquid assets to total assets (LIQ_{it}). A high level of liquid assets could help reduce the bank’s risk level but also the bank’s profitability level (Cornett et al., 2011). We include a proxy for the bank business model, as proxied by the ratio of non-interest income to total income (NII_{it}). Moudud-UI-Huq et al. (2018) showed that the diversified income structure improves the bank’s profitability and lowers the risk. Finally, we also control for the bank’s asset quality by the ratio of loan loss provision to total assets (LLP_{it}), and their leverage, by the ratio of debt to equity (LEV_{it}), similar to Laeven and Levine (2009) and Fang et al. (2020).

We employ the dynamic General Method of Moments (GMM) of Arellano and Bond (1991) and Blundell and Bond (1998) to estimate our regression. This approach addresses the potential endogeneity issue and is more suitable for panel data with relatively low time dimensions, as in our work. To ensure the robustness of our regression, we apply the Hansen-Sagan test to validate the instrument variables and the Arellano-Bond test for the second-order serial autocorrelation in the regression residuals.

4. Empirical Results

4.1. Descriptive Statistics

Table 1 reports the descriptive statistics of the data used in this paper. The ROA ratio has a mean value of 0.01, suggesting the positive profitability of Vietnamese banks. However, the profitability varies considerably between

Table 1: Descriptive Statistics

	Mean	Median	Std. Dev	Minimum	Maximum
ROA	0.010	0.008	0.007	0.000	0.044
Z-score	6.172	6.077	0.676	3.323	10.692
CAR	0.151	0.125	0.086	0.034	0.051
TA	15.310	15.381	1.288	10.0721	17.977
LIQ	0.188	0.167	0.105	0.007	0.610
NII	0.482	0.316	1.371	-0.803	16.139
LP	0.005	0.003	0.005	-0.003	0.029
LEV	1.664	1.385	1.515	0.001	12.036

This table reports the descriptive statistics of the data from 26 Vietnamese commercial banks for the period from 2005 to 2020 collected from S&P Capital IQ We to show the mean, median, standard deviations, mix, and max values of the variables in the empirical analysis.

Table 2: Correlation Matrix

Correlation	ROA	Z-Score	regcap	LIQ	NII	LLP	LEV	SIZE	VIF
ROA	1.000								
Z-Score	0.209	1.000							
regcap	0.173	-0.076	1.000						1.681
LIQ	0.191	0.045	0.134	1.000					1.232
NII	-0.284	-0.130	-0.106	-0.212	1.000				1.095
LLP	0.136	0.014	0.154	-0.246	-0.066	1.000			1.134
LEV	-0.086	0.020	-0.377	-0.123	0.067	-0.005	1.000		1.389
SIZE	-0.121	0.171	-0.488	-0.161	0.175	-0.033	0.310	1.000	1.831

This table reports the pairwise correlation matrix between the variable employed in the regression. The last column reports the variance inflation factor (VIF) of all explanatory variables.

banks, with the standard deviation at 0.007. Similarly, the Z-score varies between banks with a mean value of 6.172, but a minimum value is only 3.323. The average value of regulatory capital over risk-weighted assets is 0.151, which well-exceeded the required adequacy ratio of 8% by the State Bank of Vietnam. The descriptive statistics of other bank-specific variables also indicate significant variations between Vietnamese banks with a high level of standard deviations.

4.2. Correlation Analysis

Table 2 reports the pairwise correlation matrix between variables employed in the baseline regression. The correlation coefficients are low in all pairs of variables, indicating no multicollinearity problem. The last column presents the VIF of all explanatory variables, confirming the absence of multicollinearity as all VIF values are significantly less

than 10. Thus, our dynamic GMM regression is robust to the multicollinearity issue.

4.3. Regression Results

Table 3 provides our baseline regression results concerning the impacts of regulatory capital on the performance presented in Equation (1). The bank performance is proxied by their profitability, as measured by the return on equity (ROA) ratios, which are reported in Column (1), and bank risk, as measured by their z-score ratios, is shown in Column (2). The regression is estimated with the dynamic GMM method, and standard errors are clustered by banks and reported in parentheses. All explanatory variables are lagged one period to account for potential delayed impacts of the bank-specific variables on bank performance. In both models, the lagged dependent variables are positive and statistically significant, confirming the persistence in bank

Table 3: Baseline Model Estimation Results

	Dependent Variable:	
	ROA	Z-score
	(1)	(2)
ROA _{t-1}	0.662*** (0.077)	
Z-Score _{t-1}		0.339*** (0.105)
regcap _{t-1}	0.019*** (0.007)	3.438** (1.923)
LIQ _{t-1}	-0.001 (-0.005)	0.275 (1.149)
NII _{t-1}	0.0005** (0.0002)	0.099** (0.041)
LLP _{t-1}	0.154 (0.099)	41.395** (20.987)
LEV _{t-1}	-0.0001 (0.0004)	0.170 (0.107)
SIZE _{t-1}	0.003** (0.001)	0.265 (0.307)
Observations	182	182
Hansen-Sagan test	21.883	26
AR(2) test	0.08502	0.081

This table reports regression results of bank performance, as measured by their profitability and risk level, on the regulatory capital and bank-specific characteristics in Vietnam. The result for bank profitability, as measured by the return on equity (ROA) ratios, is reported in Column (1), whereas the bank risk, as measured by their Z-score ratios, is shown in Column (2). regcap is the regulatory capital, which measures the bank’s regulatory capital to their risk-weighted assets. Bank-specific control variables include LIQ, the ratio of liquid assets to the total asset; NII, the ratio of non-interest income to total income; LLP, the ratio of loan loss provision to the total asset; LEV, the ratio of bank debt to equity; SIZE, the logarithm of total bank asset. The dynamic general method of the moments method is applied to the regression. The last two columns are the Hansen-Sagan overidentification test for instrument variables and the p-value for the Arellano-Bond test for the second-order autocorrelation in the errors. Standard errors are clustered by bank and reported in parentheses; *p < 0.1; **p < 0.05; ***p < 0.01.

profitability and stability, similar to that reported by Yakubu and Bunyaminu (2021) and Dang and Huynh (2021). The Hansen-Sagan test statistics and p-value in the Arellano and Bond AR(2) test indicate that there is no overidentification problem in the instrument variables and no existence of

the second-order autocorrelation in the errors. Thus, our empirical models are correctly specified and consistent.

We observe that, in both models, the regulatory capital is positive and statistically significant. Thus, the regulatory capital exerts a positive impact on the Vietnamese bank performance. An increase in the bank regulatory capital significantly leads to an improvement in the bank’s profitability and lowers its risk. This finding is similar to that of Morgan et al. (2014) for the positive relationship between regulatory capital and bank profitability and in line with the result of Anginer et al. (2018), Shaddady and Moore (2019), and, more recently, Yakubu and Bunyaminu (2021) for the case of improvement in the stability of Sub-Saharan African banks.

Our results for the bank-specific variables are generally in line with the previous literature. Higher liquidity would hamper the bank profitability but lower the bank risk level, although this relationship is not statistically significant. Similar to Moudud-UI-Huq et al. (2018), we find that diversification in the bank sources of income significantly improves the bank profitability and lowers the bank risk. Interestingly, we find that higher loan loss provision ratios in Vietnamese banks significantly lower the bank risk by increasing the bank’s Z-score. In our judgment, it may be due to the high level of non-performing loans in Vietnamese banks in our sample. Thus, an increase in the loan loss provision would enhance the stability of the bank’s profitability, thereby improving the bank’s Z-score. We also observe that banks with larger assets are more profitable and stable, although the latter is not statistically significant. Finally, we do not find any significant relationship between the bank’s leverage ratios to their profitability and stability.

4.4. Heterogenous Impacts of Regulatory Capital on Bank Performance

We further expand the baseline model to explore the potential heterogeneous impacts of regulatory capital on bank performance. First, we explore the impacts of regulatory capital on the bank performance of different bank sizes. The “too-big-to-fail” hypothesis suggests that large banks tend to take regulatory arbitrage and engage in excessive risk-taking activities in the expectation of government buyouts (Farhi & Tirole 2012). Toh and Zhang (2022) further argued that smaller banks would react to raise their capital buffer more aggressively compared to that larger banks to protect their franchise. Since the bank can benefit from higher regulatory capital by improved market confidence in the bank risk (Noss & Toffano 2016), we further investigate whether government ownership and listed status lead to different impacts of regulatory capital. Nguyen (2018) showed that majority government ownership significantly affects bank efficiency in ASEAN countries, including Vietnam. The

listed status could also affect risk-taking behavior due to considerable differences in the asymmetric information and agency problems. Tran et al. (2019) showed that regulatory requirements put more pressure on the unlisted bank to reduce their risk-taking activities than that on the listed bank. The ownership structure also affects the bank’s risk management and corporate governance quality (Abid et al., 2021). In particular, state-owned banks tend to focus more on socio-economic activities, whereas privately-owned banks mainly focus on profit maximization (Duqi & Al-Tamimi 2018). In this regard, we add to the baseline model (1) the interactive terms between regulatory capital and bank size, banks’ ownership structure () and listed status . In particular, and are dummy variables that take value 1 if the bank *i* has majority government ownership and is listed on the stock market in year *t*, respectively. The modified models are expressed as follows:

$$\begin{aligned} \text{bankperform}_{it} = & \alpha + \beta_1 \text{bankperform}_{i,t-1} \\ & + \beta_2 \text{regcap}_{i,t-1} + \beta_3 \text{regcap}_{i,t-1} \\ & \times \text{size}_{i,t-1} + \beta' X_{i,t-1} + \varepsilon_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{bankperform}_{it} = & \alpha + \beta_1 \text{bankperform}_{i,t-1} \\ & + \beta_2 \text{regcap}_{i,t-1} + \beta_3 \text{regcap}_{i,t-1} \\ & \times \text{state}_{i,t-1} + \beta' X_{i,t-1} + \varepsilon_{it} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{bankperform}_{it} = & \alpha + \beta_1 \text{bankperform}_{i,t-1} \\ & + \beta_2 \text{regcap}_{i,t-1} + \beta_3 \text{regcap}_{i,t-1} \\ & \times \text{listed}_{i,t-1} + \beta' X_{i,t-1} + \varepsilon_{it} \end{aligned} \quad (3)$$

Table 4 reports the regression results with interaction terms between regulatory capital and the bank’s size, state-ownership (state), and listed (listed) dummy variables to investigate the heterogeneous impacts of regulatory capital on bank performance in panel A, panel B, and C, respectively. First, we observe that regcap remains positive and statistically significant in all regressions, strongly indicating the positive impacts of regulatory capital on the bank performance. Second, we find significant heterogeneity in the impacts of regulatory capital on the bank profitability, whereas the effects on bank risk are insignificant regarding bank size, state-ownership, and listed status. In particular, the coefficients of interactive variables are negative and significant in all bank profitability regressions, indicating that the positive impacts of regulatory capital on the bank profitability are weaker for larger banks, banks with state ownership, and banks that are listed in the stock markets. This result supports the findings of Morgan et al. (2014) and Fang et al. (2020), who argued that smaller banks react more aggressively to the stricter regulatory requirements and would improve their profitability by lowering their funding costs from higher creditability to the investors.

5. Discussion

The global financial crisis has forced banking regulators to increase the bank regulatory capital to strengthen the banking sector stability and consequently boost economic growth. The regulatory reform also triggers a debate between policymakers and researchers on the relationships between regulatory capital on bank performance. We contribute to the literature by new empirical evidence on the impacts of regulatory capital and bank performance, as proxied by their profitability and risk from the Vietnamese banking sector. In line with previous studies in the developed markets, we find that higher regulatory capital improves the bank performance with higher profitability and lower bank risks. In particular, we find that the smaller, non-state-owned banks and unlisted banks are more beneficial from an increase in the regulatory capital. This finding may indicate that the improvements in bank performance are mainly driven by reductions in the risk premium of the banks, resulting in lower funding costs and higher profitability (Noss & Toffano 2016; Fang et al., 2020).

Our study also provides several policy implications. First, our empirical evidence focuses on the Vietnamese banking sector, as an emerging market, which recently imposed higher regulatory capital in a stable and fast-growing macroeconomic, rather than a reaction to the global financial crisis as in developed countries. Second, we observe the heterogeneous impact of the regulatory capital on the bank profitability, regarding their size, ownership, and listed status. Thus, the stringent regulatory capital requirements would consistently benefit the bank performance and enhance the banking sector stability due to improvements in smaller banks and consequently the competition within the sector.

6. Conclusion

We contribute to the nexus of capital requirement and bank performance by exploring the impacts of regulatory capital on the bank performance, proxied by the bank stability and profitability. Using data samples from Vietnamese banks from 2005 to 2020, our panel regression with the General Method of Moment approach. Indicate that higher regulatory capital improves a bank’s performance with higher profitability and increases bank stability. This finding is in line with Agoraki et al. (2011), Noss and Toffano (2016), and Fang et al. (2020), who highlight the importance of strengthened capital requirements in emerging countries. We further explore whether the impacts of regulatory capital are heterogeneous across bank characteristics. We find that the smaller, non-state-owned, and unlisted banks are better beneficial from strengthened regulatory capital. This result might also be due to the more aggressive response of

Table 4: Heterogenous Impacts of Regulatory Capital on Bank Performance

	Panel A: Size		Panel B: Ownership Structure		Panel C: Listed Status	
	ROA	Z-Score	ROA	Z-Score	ROA	Z-Score
ROA _{t-1}	0.621*** (0.076)		0.649*** (0.075)		0.645*** (0.072)	
Z-Score _{t-1}		0.343*** (0.112)		0.336*** (0.106)		0.333*** (0.103)
regcap _{t-1}	0.196** (0.093)	3.013** (1.513)	0.021*** (0.007)	3.279* (1.945)	0.021*** (0.007)	3.374* (1.912)
regcap × size	-0.012* (-0.006)	-0.391 (-1.849)				
regcap × state			-0.067** (-0.027)	8.799 (10.527)		
regcap × listed					-0.033** (-0.017)	2.552 (2.6)
Bank control variables	YES	YES	YES	YES	YES	YES
Observations	182	180	182	180	182	180
Hansen-Sagan test	23.9523	26	24.107	23	23.8444	23
AR (2) test	0.069	0.0765	0.0925	0.0681	0.0874	0.0826

This table reports regression results of bank performance, as measured by their profitability and risk level, on the regulatory capital and bank-specific characteristics in Vietnam specialized in Equations (3), (4), and (5). The bank performance is proxied by their profitability, as measured by the return on equity (ROA) ratios, and bank risk as measured by their Z-score ratios. In panels A, panel B, and C, we also include the interaction term between regulatory capital and the bank’s size, state-ownership (state), and listed (listed) dummy variables, respectively, to investigate the heterogeneous impacts of regulatory capital on bank performance. In all models, regcap is the regulatory capital, which measures the bank’s regulatory capital to their risk-weighted assets. Bank-specific control variables include LIQ, the ratio of liquid assets to the total asset; NII, the ratio of non-interest income to total income; LLP, the ratio of loan loss provision to the total asset; LEV, the ratio of bank debt to equity; SIZE, the logarithm of bank total asset. The dynamic general method of the moments method is applied to the regression. The last two columns are the Hansen-Sagan overidentification test for instrument variables and the p-value for the Arellano-Bond test for the second-order autocorrelation in the errors. Standard errors are clustered by bank and reported in parentheses; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

weaker banks, which are less profitable and less capitalized, to changes in the regulatory requirements to protect their charter values (Fang et al., 2020). Thus, the positive effects of higher capital requirements might be mainly resulted from improved market confidence in the bank’s risks of smaller banks and subsequently reducing the bank cost of funding (Noss & Toffano 2016).

The outcomes of the present study could further be examined by increasing the sample size to include bank data from other emerging markets, in addition to the case of the Vietnamese banking sector. Future studies may also investigate the channels through which the information on regulatory capital of the commercial banks would affect the bank’s profitability and stability.

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Appendix 1: List of Banks in the Sample

No	Bank Name in Abbreviation	Status of State-Ownership	Official Time Listing on the Stock Market
1	Agribank	Yes	N/a
2	BIDV	Yes	24/01/2014
3	VietinBank	Yes	16/07/2009
4	Vietcombank	Yes	30/06/2009
5	Techcombank	No	04/06/2018
6	ACB	No	31/10/2006
7	VP Bank	No	17/08/2017
8	MB	No	01/11/2011
9	Maritime Bank	No	23/12/2020
10	VIB	No	09/01/2017
11	HD Bank	No	05/01/2018
12	An Binh Bank	No	N/a
13	Bao Viet Bank	No	N/a
14	PG Bank	No	N/a
15	Sacombank	No	12/07/2006
16	NCB	No	13/09/2010
17	Bac A Bank	No	02/01/2018
18	Kienlong Bank	No	N/a
19	LienViet Post Bank	No	05/10/2017
20	OCB	No	N/a
21	SCB	No	N/a
22	SHB	No	20/04/2009
23	Saigon Bank	No	N/a
24	Tien Phong Bank	No	19/04/2018
25	Southeast Asia Bank	No	N/a
26	Eximbank	No	27/10/2009