
OWNERSHIP STRATEGY AND BANK PERFORMANCE – EVIDENCE FROM VIETNAM

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Abstract. This paper examines the impact of ownership strategy on bank performance in Vietnam from 2000 to 2017. The results show that the ownership structure has a significant impact on bank performance, namely that state-owned banks are more efficient than private ones in terms of technical efficiency, but not in terms of scale efficiency. Furthermore, state-owned banks do not appear to be excellent at investment activities while provisions for credit losses are substantially high, which can negatively affect their performance. Listed banks may be more encouraged to implement activities which can increase bank performance, to make present stakeholders satisfied as well as to attract new ones. The larger the scale, the more efficient the listed banks will be. However, they will not achieve good results in terms of technical efficiency.

Keywords: State ownership; ownership structure; private bank; banking system; bank performance, bank efficiency; Vietnam

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JEL Classifications: M1, M10, M21

1. Introduction

Developing markets generally face underdeveloped and illiquid stock markets, economic risks, poor regulatory control and investor protection, frequent interventions and the dominance of centralized share ownership and ownership control (Ahunwan, 2002; Rabelo & Vasconcelos, 2002; Tsamenyi, Enniful-Adu, & Onumah, 2007; Siddique, Masood, Javaria, & Huy, 2020). The owner factor (foreigner, family, organization or state) is the deciding factor for a healthy banking system. In particular, changes in ownership structures without the support and supervision of any department can lead to banking crises (Boubakri, Cosset, Fischer, & Guedhami, 2005). The three main types of banking institutions in emerging markets are state-owned, private and foreign. At the same time, the strengths and weaknesses of the type of organization and bank structure are still poorly understood. Differences are important in storage and analysis because each type of bank is different in terms of incentive structure, organization and regulations. For example, the state-owned bank has few cash flow incentives and ethical problems when it is the owner and manager at the same time. Private Banks have higher cash flow incentives and make a clear distinction between the regulatory authority and the owner. On the other hand, foreign banks are relatively similar to domestic banks in terms of cash flow preferences and different organizational structures. Foreign banks often have a multi-level structure, with senior managers from other countries. Many studies have argued that the relationship between ownership concentration and business activity is complex. Many empirical studies have yielded mixed results (Demsetz, 1983; Demsetz & Lehn, 1985; Shleifer & Vishny, 1986). Because these results are contradictory and ambiguous, it suggests that differences in political, economic and institutional conditions are likely to change the aforementioned relationship.

Hence, there is a need for effective governance in the banking sector in developing countries. Many studies have shown that the failure of corporate governance is one of the main causes of the Asian financial crisis (Barca & Becht, 2002) and the global crisis in the US and around the world, which emphasizes the strong importance of corporate management. Zulkafli and Samad (2007) cited many studies emphasizing the distinguishing characteristics of the banking sector and the importance of corporate governance for banks. The banking sector plays an important role in economic growth and development (Khan & Senhadji, 2000; Levine, 1997) and, therefore, requires strict regulations. Besides, M. M. Cornett, Guo, Khaksari, and Tehranian (2010) investigated the relationship between the different mechanisms of corporate governance and bank performance in a crisis with a sample of about 300 publicly traded banks in the United States. In contrast to Erkens, Hung, and Matos (2012) they find better corporate governance practices: the more independent board, the higher sensitivity to pay for performance, and an increase in internal ownership will have a positive correlation with the crisis of the banks.

In a nutshell, the influence of the ownership structure on the performance of companies has been extensively studied. Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990) are concerned with the valuation of companies with different ownership models, such as management ownership ratios. Short and Keasey (1999) examine the performance of companies in the UK based on managerial ownership. The impact of foreign ownership on business performance is significant in the studies of Aggarwal and Kyaw (2010) and Lee and Kwok (1988) especially in terms of the capital structure policy. Meinster and Elyasiani (1988) examine the differences in performance of US banks with foreign ownership, minority ownership and holding company ownership. They find that the performance of foreign banks is not different from that of banks holding company, while minority-owned banks have poor profitability. Similar studies in continental banks include Maudos, Pastor, Perez, and Quesada (2002), Altunbas, Evans, and Molyneux (2001), Casu and Girardone (2002).

The impact of the ownership structure on banking performance needs to be studied in a specific market because research in one country can not be transferred to another. Moreover, commercial banks are one of the important factors that promote the economy. For that reason, we conduct this study to investigate the influence of state ownership on the performance of Vietnamese commercial banks in recent years. Besides, the Vietnam market is a unique, socialist-oriented market economy, reforming to integrate into the contemporary global market economy. So, researches need to be conducted in the Vietnam market to provide policy measures and implications for governance with the latest empirical evidence.

2. Literature review

Privatization is part of a broader liberalization process, which includes the liberalization of interest rates, market access and the extension of credit quotas. At the same time, a completely free exchange rate market will open up opportunities for profit from price differences for licensed banks. Gilbert and Wilson (1998) surveyed the liberalization of banking operations of private banks in Korea in 1980 and 1994, the results showed that this contributed to an improvement in bank performance. Altunbas et al. (2001) recognize the improvement in marginal efficiency and the increase in equity among privatized banks in OECD¹ countries. For instance, in Germany, although there was almost no convincing evidence that private banks were more efficient than state-owned banks, private banks were more cost-effective and more profitable. Derived from agency theory and public choice theory, Clarke, Cull, and Shirley (2005) believe that private ownership is more effective than state ownership in creating management incentives to increase productivity and reduce production costs.

In a transnational study, La Porta, Lopez-de-Silanes, and Shleifer (2002) found that state-owned banks were less efficient than private banks. The authors explain that politicians use state-owned banks for their political purposes, which leads to a decline in economic development. Bonin, Hasan, and Wachtel (2005) also find that private banks are more efficient than state-owned banks. Yao, Jiang, Feng, and Willenbockel (2007) argue that higher state ownership leads to lower efficiency, fewer savings and loans, lower productivity and slower growth. Other studies conclude that the state ownership structure of the bank reduces financial development and increases the risk of banking crises (Caprio Jr & Peria, 2000).

¹ On 14 December 1960, 20 countries originally signed the Convention on the Organisation for Economic Co-operation and Development. Since then, 17 countries have become members of the Organisation.

The state ownership structure can affect the performance of the business when the objectives of the government and the shareholders are not compatible, also known as agency problems. Shareholders often want to maximize profits, but the state has many other social purposes: to increase employment or to engage in politics, to prevent foreign investors from entering and to protect domestic property. Or the division between ownership and management will result in directors (agents) pursuing personal interests rather than trying to achieve the best interests for the owner. Shleifer and Vishny (1997), Capobianco and Christiansen (2011) argue that it is the difference between the objectives of the state and shareholders that hurt the company's performance. Furthermore, it is believed that the agency's high costs and poor governance may negatively affect the performance of the state ownership structure (Alchian & Demsetz, 1972; Shleifer, 1998). Then comes the problem of the "free rider." State ownership, in theory, means that all citizens are co-owners, but in reality, they have no power to coordinate the governance of the state-owned banks, leaving governments as the only effective representative (Huibers, 2005). The third problem is the potential moral hazard if the state-owned banks implement soft budgetary restrictions. The state-owned banks act as financial representatives of the government and support state-owned enterprises (SOEs) for political reasons and not for economic reasons. Therefore, when the state-owned banks are faced with difficulties, they often rely on government assistance, so their management has no incentive to minimize costs or maximize profits. Finally, the theory of "quiet life" also helps to explain why the structure of state ownership is not so effective. Another common argument to explain why state-owned enterprises are often inefficient is that banks differ so much from typical non-financial institutions in their operating characteristics, business models, capital structure and regulatory environment. This requires different approaches to assess the performance of companies, such as some studies in the US (Barr, Killgo, Siems, & Zimmel, 2002; Mukherjee, Ray, & Miller, 2001).

If problems such as agency costs are resolved, the state-owned structure is considered a good way to improve business efficiency. Firth, Fung, and Rui (2008) found that government ownership makes it easier for companies to raise capital. In developing countries, the state-owned structure is more prominent and banks often dominate finances, but they play a relatively limited economic role. The government is said to be an organization that helps develop projects that, while low-income, bring many social benefits. Moreover, the state can help promote development and industrialization when private capital is weak. Therefore, the form of state ownership brings economic efficiency by striking a balance between economic and social indicators (Megginson, 2005). Also, the link with the government helps companies to get a goodwill attitude from the state and make administrative requirements more quickly.

Empirical evidence shows improvements in bank performance after privatization (Berger, Demirgüç-Kunt, Levine, & Haubrich, 2004; Cornett et al., 2010; Williams & Nguyen, 2005) assess the impact of the privatization of banks by 69 banks in Nigeria during the period 1990 - 2001 when other major changes in the financial system appeared. It concludes that privatization improves banking performance, but does not exceed the performance of other private banks in the Nigerian banking system.

The negative impact of the state-owned structure on banking performance was found on the banking sector in the Czech Republic from 1993 to 1998 and developing countries (Micco, Panizza, & Yanez, 2007), and industrialized countries in Eastern Europe (Fries & Taci, 2005). The results show that the minority-government-owned banks in Nigeria have poor performance (profits and loan portfolios). Berger, Hasan, and Zhou (2009) using a sample of 38 Chinese banks from 1994 to 2003, found that the state-owned bank of the "Big Four" was the least effective and at the same time had a high amount of bad debt. Lin and Zhang (2009) also came to similar conclusions.

Sensarma (2006) found that in India, domestic public and private banks are more effective than foreign banks. Fries and Taci (2005) in a study in 15 countries with transition economies in Eastern Europe (including Russia) found that private banks are more cost-effective than state-owned banks. In Argentina, Cull, D'Amato, Molinari, and Clarke (1999) find evidence that credit allocation is more efficient at private banks. Also, Omran (2007) studied a sample of 12 banks from Egypt between 1996 and 1999, when the property was transferred from the public to the private sector. After privatization, the banks' profitability and liquidity ratios are significantly reduced, although other performance measures remain unchanged. However, the change in the activity

of private banks is better than that of state-owned banks. Therefore, private banks are more effective than state-owned banks. Mian (2003) study has taken a sample of 1,600 banks, including private banks, foreign banks and state-owned banks, from 100 emerging economies during 1992-1999. The study concludes that banks with foreign-owned components are the most efficient, state-owned banks are the least efficient, but the risk of insolvency is lower. Mian (2003) analysis also shows that state-owned banks are often larger and older than private banks and foreign banks, which in part underlines the point of view of setting up large banks of governments in developing countries with weak financial markets in order to boost the economy.

Research has expanded to emerging economies in the last ten years. Cornett et al. (2000) examined the differences in performance between private and state-owned banks in five selected countries in Asia: South Korea, Indonesia, Malaysia, the Philippines and Thailand from 1994 to 1997. The results of the analysis indicate that the performance of the state-owned bank was low, especially during the Asian financial crisis of 1997. Similarly, Karim (2003) research on the banking system in Malaysia also shows that state banks are less efficient than private banks. Isik and Hassan (2002) on Turkish banks and Indian banks have drawn similar conclusions. Semih Yildirim and Philippatos (2007), who researched transition countries, concluded that foreign banks while being highly cost-effective, did not earn as much profits as private domestic banks or state-owned banks.

Therefore, to exploit more advantages, the form of privatization of companies was born. This is seen as a solution to the problem of owners and agents by building a better management system. Private banks limit budgetary constraints, putting pressure on managers to improve operational efficiency to please existing shareholders and attract more potential investors. In the meantime, shareholders are expected to exercise control over management to secure their investment capital.

Together with the transformation of the economy in Vietnam, the contribution of state and foreign companies accounted for more than half of the gross domestic product in 2000, 2006 and 2012. As such, state ownership and foreign ownership play an important role in the economy of Vietnam. In Vietnam, there is very little research on the ownership and business value. Previously, no study has systematically studied the relationship between foreign ownership and performance in the Vietnamese context. Phung and Mishra (2016) conducted the first study to systematically examine the influence of foreign and state ownership on corporate values in the context of Vietnam. Using a generic approach (GMM). The empirical results show that state ownership has a convex relationship with corporate performance. The results showed that business performance has increased by more than 28.67% of the state ownership level. Moreover, foreign ownership has an inverted U-shaped relationship with the performance of the company, i.e. a decline in the profits of enterprises when they were originally state-owned, according to 21 companies listed on the Vietnam stock market.

In the past, Vietnam was a centrally planned economy. However, in 1986, important economic reforms (also called Doi Moi) took place and Vietnam adopted a market economy. Accordingly, the privatization of state-owned enterprises, also known as 'equitization' in Vietnam, was proposed in 1991 and implemented in 1992. The privatization process helped change the ownership of state-owned companies by selling part of the shares to local and foreign investors, to improve operational efficiency. This move implies that private and foreign ownership plays an important role in improving the economy of Vietnam. The privatization of thousands of small and medium-sized companies between 1990 and 2000 led to an increase in the number of companies.

It can be said that the studies on property and company values, or more specifically bank value, are still very rare in Vietnam. According to Phung and Mishra (2016), no research was conducted in Vietnam to systematically investigate the relationship between foreign ownership and the performance of companies, nor to analyze the impact of state ownership on the performance of listed companies. The study by (Dang-Thanh, 2012), with data from 1999-2010, suggested that the expansion of the scale negatively impacts bank performance. However, the study by Tran, Lin, and Nguyen (2016), with data from 2005 to 2011, concluded that the size of the bank has a positive impact on bank performance. Besides, state ownership negatively impacts the performance of banks, as well as the influence of the banking system on the economy. However, the study by Nguyen and Le (2017) concludes that state-owned commercial banks use resources more efficiently than private commercial banks.

Last but not least, Mateev (2019) find that the impact of regulatory measures on bank profitability does not depend on bank ownership type. We also investigate whether the impact of regulation and ownership is different between conventional and Islamic banks, and find that the interaction effect of bank regulations and different types of ownership on a banks' profitability is strongly significant only in the sample of Islamic banks. The analysis of bank performance before and after the recent global financial crisis reveals that bank regulations have no influence on cost efficiency of a conventional bank either before or after the crisis. Gupta et al. (2020) reveal that private sector banks are more profitable than the public sector banks. Additionally, the results of the study show that bank size, non-performing loan ratio and revenue diversification are the major determinants of the commercial banks performance in India. Furthermore, the results reveal that during the crisis period the impact of bank size, bank age, labour productivity and revenue diversification on the performance of the Indian banks is robust. The higher non-government stake leads to the enhanced performance of the commercial banks in India. The higher capital adequacy leads to the increase in the performance of the banks.

3. Research Methodology

3.1. Data sample

The data sample used in this study comes from 20 Vietnamese commercial banks with a long period of operation and accounts for some 80% market share in Vietnam banking system. The study period was from 2000 to 2017, extracted from annual reports of these commercial banks on Bankscope and.

3.2. Research model

The research model used in this study is based on the research of Boateng, Huang, and Kufuor (2015). The two additional dependent variables are CRS_TE and SCALE, based on the model used in the study by Eken and Kale (2010) to investigate many aspects of commercial bank performance in Vietnam.

Based on previous studies, the author used the panel random-effects model that included random effect (τ), and the error term ϵ_{it} to study the impact of the ownership structure on the performance of Vietnamese commercial banks. The model has been developed as follows:

$$\underline{PER}_{it} = \alpha + \beta_1 BD_{it} + \beta_2 SB_{it} + \lambda Controls_{it} + \tau + \epsilon_{it} \quad (1)$$

Here, we use two dummy variables BD_{it} and SB_{it} , respectively, to Listing and State. And the meaning of β_1 and β_2 will be changed, details are explained in Table 1 - Variable notes.

3.2.1. Dependent variables

The dependent variable PER_{it} in equation (1) indicates the bank performance indicators developed by a set of nine separate bank performance indicators, namely: loan lost reserve/gross loans (LLR), loan lost provision (LLP) / Net interest revenue, total capital ratio, equity / net debt, net interest margin (NIM), return on average assets, return on equity (ROE), net debt /total assets, current assets/deposits and short-term capital. Further, this study will have two additional dependent variables: CRS_TE - constant technical efficiency variable by scale, and SCALE – return to scale variable.

The CRS_TE and SCALE variables are calculated using the DEA function in STATA with three input variables and three output variables. Specifically, the input variables are deposit, interest expense and non-interest expense. The deposit is the amount that has been deposited in the bank. The interest expense corresponds to the interest accrued in the period of the financial statement. The non-interest expenses related to staff salaries, benefits and information technology, telecommunication services, taxes, marketing, depreciation of intangible assets, etc. The three output variables are total loan, interest revenue and non-interest revenue. In which, the loan loss in total loan are adjusted to compare the quality of the banks' liabilities. Interest income is the income

that the bank generates from investments or loans. Non-interest revenue is the bank income that comes from deposit fees, transactions, NSF, monthly account service fees, test fees, etc.

DEA function:

$$\text{Maximize } \frac{\sum_{r=1}^s 1u_r \cdot Y_{rk}}{\sum_{i=1}^m 1v_i \cdot X_{ik}}; \text{ Condition: } \frac{\sum_{r=1}^s 1u_r \cdot Y_{rk}}{\sum_{i=1}^m 1v_i \cdot X_{ik}} \leq 1$$

$$u_r, v_i > 0; r = 1, \dots, s; i = 1, \dots, m$$

3.2.2. The explanatory variables

Types of bank ownership include foreign banks, domestic private banks and state-owned banks. We measure bank ownership by creating dummy variables for the ownership type. Listing takes 1 for the listed commercial bank and 0 for unlisted banks. The state takes the value of 1 if it is a state-owned commercial bank, 0 if it is a private bank. A vector of macroeconomic variables and specific indicators is created, including log of GDP per capita (PCGDP), real annual GDP growth rate (GDP), inflation (CPI), unemployment rate (UEMP), bank size, banking diversity (BD), taxes and leverage.

3.2.3. Control variables

Macroeconomic factors

Previous studies have not fully controlled the effects of macroeconomic factors in the analysis of bank performance. However, the macroeconomic environment can affect banks through several channels (García-Herrero, Gavilá, & Santabábara, 2009). For example, it is stated that credit risk is affected by economic growth, inflation and unemployment since these variables influence the debtor's ability to repay debts (Festić, Kavkler, & Repina, 2011). In terms of GDP, Grigorian and Manole (2002) observed that bank performance is significantly related to GDP per capita. However, Fries and Taci (2005) found no correlation between cost-effectiveness and GDP per capita.

For inflation, Bourke (1989) and Boyd, Levine, and Smith (2001) point out that inflation, in general, is related to higher profits because the additional income from inflation tends to compensate for higher labor costs.

Previous studies have shown that state-owned banks can pursue social and political goals rather than the goal of maximizing shareholder returns (Nutt, 2000). One of the reasons for the poor performance of state-owned banks is the use of these banks to create more jobs and reduce social pressure on the government (Yao et al., 2007). However, after decades of banking reform, we hope that banks will no longer be used to reduce unemployment and other political objectives, even when unemployment rates show an upward trend in China's research context. However, according to our research, there has not been any study on how unemployment affects the performance of Vietnamese banks as a component of macroeconomic factors. In general, previous studies have used one or two macroeconomic factors as control variables rather than fully controlling these variables. Therefore, this study will solve that problem and investigate the impact of macroeconomic factors on bank performance.

Characteristics of Banks

Previous studies have emphasized the effectiveness of the bank's characteristics in its performance. Therefore, we control the size of the bank, the banking diversity and the capital structure. The size of a bank is an important determinant of its performance. There is an opinion that the bank size has a positive and significant impact on bank performance as large companies tend to benefit from the efficiency of the scale and are therefore more effective. Studies such as Zhou and Wong (2008), on the other hand, suggest that large banks often have lower margins and lower profits. So, we combine in this model the bank size, measured by the log of total asset, as a control variable. We also control bank diversity (BD), measured by the ratio of other operating income/average assets.

It is also suggested that highly leveraged banks that can be subdivided into several related companies will lead to cost advantages compared to specialized competitors (Elsas, Hackethal, & Holzhäuser, 2010). Several studies have found that diversification enables banks to use special resources to expand their competitive advantage from one market to another (Stein, 1997; Villalonga, 2004). Most previous studies support the positive relationship between leverage and banking advantages (Athanasoglou, Brissimis, & Delis, 2008; Hutchison & Cox, 2007; Pratomo & Ismail, 2006).

Table 1. Variable description

	Variable	Description/Calculation
Dependent variables		
Bank performance	CRS_TE	Constant technical efficiency to scale
	SCALE	Efficiency to scale
	NIM	Net interest margin: Interest income minus interest expense over earning assets (%)
	ROE	Net profit after tax divided by average total equity (%)
Bank risk	LLP	Loan loss provision on the balance sheet (absolute number)
	LLR	The ratio of loan loss provision to loans (%)
Independent variables		
Macroeconomics	GDPG	Annual GDP growth (%)
	PCGDP	GDP per capita (USD)
	CPI	Consumer Price Index: Inflation rate (%)
	UEMP	Unemployment rate (%)
Bank-specific	BD	Bank diversification: the ratio of net profit from other activities to average total assets (%)
	ENL	Capital structure: The ratio of equity to total liabilities (%)
	LTA	Natural logarithm of total assets
Dummy variables	Listing	Dummy variable for listed banks
	State	Dummy variable for banks with state ownership

4. Research results and discussion

4.1. Descriptive statistics

Table 2 shows that the means of two typical bank performance variables such as NIM and ROE are at a high level, 2.97% and 12.29% respectively. Moreover, the bank's scale efficiency (SCALE) and technical efficiency (CRS_TE) have positive values, although not high. These figures suggest that banks in our sample are performing effectively in terms of optimal inputs and outputs. Also, we observe that this group of banking performance variables has large differences between the highest and the lowest values, which means that the performance results of the banks in our study are quite erratic.

The group of variables representing bank risk (LLP, LLR) also appears to show a similar trend with a large difference between the highest and lowest values. All their means are positive, demonstrating that all research banks are making efforts in operational risk management. In particular, the average LLP and LLR stand at 2424 and 1.358, respectively, suggesting that Vietnamese banks maintain a significant ratio of total capital to risk-weighted assets. We can assume that these banks are cautious about risks.

Table 2. Descriptive statistics

Variable	No. of obs.	Mean	Std. Dev.	Min	Max
<u>Bank performance</u>					
CRS_TE	248	0.7272	0.1484	0.0049	1.0000
SCALE	248	0.8310	0.1091	0.0209	1.0000
NIM	248	2.9659	1.4919	-1.8420	9.7530
ROE	248	12.2852	10.0464	-56.3260	53.6130
<u>Bank risk</u>					
LLP	248	2424.7410	11050.1500	-2304.8830	119853.9000
LLR	248	1.3583	0.9855	0.0000	6.2990
<u>Macroeconomic</u>					
GDPG	248	2.9369	0.3360	2.1398	3.3698
PCGDP	248	1112.2700	685.2528	137.9826	2343.1250
CPI	248	7.1766	5.8622	-1.7103	23.1163
UEMP	248	2.2243	0.2868	1.7700	2.8700
<u>Bank-specific</u>					
BD	248	2.7432	7.4902	-1.7350	53.3300
ENL	248	20.4698	24.1286	4.6200	370.7150
LTA	248	4.4901	0.8710	1.7168	6.0798

Notes: For the notation of the variables, see Table 1.

4.2. Impact of ownership structure on bank performance

The Breusch and Pagan Lagrangian multiplier test shows that all parameters are significant at the 1% level, which implies the rejection of H_0 hypothesis (H_0 : The OLS regression is appropriate). Consequently, the random effect model (REM) is used for regression respectively with different dependent variables. Two dummy variables Listing and State would be both rejected if we used the fixed-effect model (FEM), so we do not use this method.

The research results do not report any statistically significant evidence to demonstrate the positive effects of the state- ownership structure (state) on the technical efficiency of banks (CRS_TE). Vietnamese state-owned commercial banks receive lots of support from the government and State bank of Vietnam, which enables them to attain cheap capital inputs through good relationships with state-owned corporates or State Treasury. However, our study results in Table 3 do not significantly support this view.

Listed banks are more efficient in scale than non-listed banks (0.0584, 10%). In practice, listed banks' financial statements are generally more transparent thanks to a clearer monitoring and supervision system by shareholders, investors and government departments. Banks are therefore motivated to improve their management, to use capital more efficiently, to control bad debts and to better control expenditure.

When the dependent variable is ROE, we find no statistically significant relationship between this performance variable and state-ownership structure. Moreover, listed banks use their capital more efficiently than unlisted banks (5.8320, 5%). In other words, listed banks are more encouraged to step up activities that help increase ROE than unlisted banks. The reason is that the former are monitored more strictly by shareholders and investors, or generally suffer from increased competitive pressure with other listed banks on the market. The positive relationship between listing and ROE can also be explained by the efforts of banks to reach higher profit as shareholders' expectations and to achieve a higher ROE ratio to attract more investment. However, when considering three other bank performance variables such as ROA, CRS_TE and SCALE as dependent variables, the parameters of Listing are not significant. This implies that listed banks in our sample are efficient only in the use of capital.

The control variable representing banking diversity BD has negative effects on technical efficiency CRS_TE (-0.0213, 10%) and the NIM net interest margin (-0.299, 1%). But we also found a positive relationship between bank diversity and ROE (3.223, 1%). Hence, commercial banks that diversify their businesses outside of their core services will not achieve as good results as banks that focus on their core business.

Meanwhile, the ratio of equity to total liabilities is negatively correlated with the technical efficiency CRS_TE (-0.0011, 5%), although the regression coefficient is not high. At the same time, the results show a positive relationship between ENL and NIM (0.0193, 1%). The ENL ratio represents the long-term payment capacity of banks. Better long-term payment ability is accompanied by better bank performance.

Considering macroeconomic variables, GDP per capita (PCGDP) has a negative relationship with CRS_TE (-0.0002, 10%), NIM (-0.0019, 1%), and ROE (-0.0172, 1%). These results are consistent with the conclusions of Boateng et al. (2015). According to their papers, an improvement in GDP per capita is linked to higher expenses for loan loss provisions, which leads to a negative impact on bank profitability.

Finally, our study finds a positive correlation between annual GDP growth and the two performance variables NIM and ROE. This finding suggests a strong relationship between the financial system and the macroeconomic environment. Indeed, higher GDP growth usually goes hand in hand with higher bank performance. In other words, commercial banks perform better under good economic conditions. Conversely, if this macroeconomic factor is quickly volatile, banks will be adversely affected.

Table 3. Random-effect regression results with bank performance variables as dependent variables

	CRS_TE	SCALE	NIM	ROE
Listing	0.0584* (2.44)	0.023 (1.08)	0.812 (1.58)	5.832** (3.06)
State	-0.0473 (-1.38)	0.0289 (0.96)	-0.134 (-0.21)	-1.842 (-0.69)
GDPG	0.388* (2.17)	0.168 (1.20)	5.943*** (4.09)	30.59** (3.19)
PCGDP	-0.0001* (-2.12)	-0.0000 (-0.61)	-0.0018*** (-3.32)	-0.0172*** (-4.37)
CPI	-0.0013 (-0.77)	0.0006 (0.44)	0.0119 (0.92)	-0.0425 (-0.45)
UEMP	0.0033 (0.10)	-0.0316 (-1.14)	-0.432 (-1.68)	-1.939 (-1.02)
BD	-0.0213* (-2.02)	0.0169* (2.17)	-0.299*** (-3.63)	3.223*** (5.88)
ENL	-0.0010** (-2.91)	-0.0000 (-0.03)	0.0193*** (6.74)	-0.0192 (-0.92)
LTA	-0.0108 (-0.41)	-0.0682** (-3.09)	-0.506 (-1.85)	2.341 (1.36)
Constant	-0.192 (-0.51)	0.706* (2.39)	-10.23*** (-3.42)	-72.37*** (-3.62)
No. of obs.	296	296	296	296
LM test	119.17*** (0.000)	17.30*** (0.000)	205.69*** (0.000)	141.00*** (0.000)

Notes: All variables in these regressions have been defined in Table 1. P(value) are shown in parentheses.
*, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

4.3. Impact of ownership structure on bank risk, period 2000-2017

The Breusch and Pagan Lagrangian multiplier test shows that all parameters are significant at the 1% level, which implies the rejection of H_0 hypothesis (H_0 : The OLS regression is appropriate). Consequently, the random effect model (REM) is used for regression respectively with different dependent variables. Table 4 presents the random-effect regression with bank risk variables as dependent variables.

The results show no statistically significant evidence of the difference in risk level between listed and unlisted banks. However, the state ownership structure is positively correlated with both LLP (3149,6, 1%) and LLR (1.096, 1%). To explain this result, loan loss will cause a fake performance index. State-owned banks generally maintain a high level of loan loss provisions to anticipate potential risks. Furthermore, in addition to profit goals, state-owned banks must also act for other social purposes. This special feature, together with the weakness of risk management, generally forces the state-owned banks to suffer greater losses on loans. Besides, loans from state-owned banks are not highly secured or present a high latent risk. So, these banks have to set higher loan loss provision compared to other banks and negatively impact the bank performance. This also linked to the fact that customer service at state-owned banks has not been appreciated in comparison to private banks.

Table 4: Random-effect regression results with bank risk variables as dependent variables

	LLP	LLR	
Listing	-35.60 (-0.08)	0.0544 (0.33)	
State	3149.6*** (5.59)	1.096*** (4.29)	
GDPG	2752.8 (1.77)	-1.499 (-0.91)	
PCGDP	0.126 (0.21)		0.000520
CPI	17.63 (1.54)	0.0160 (1.30)	
UEMP	-644.3* (-2.55)	-0.285 (-1.07)	
BD	246.7* (2.52)	-0.0207 (-0.19)	
ENL	-1.108 (-0.47)		-0.00106
LTA	-619.9* (-2.44)	0.323 (1.68)	
Constant	-4318.2 (-1.28)	4.029 (1.09)	
No. of obs	224	224	
LM test	186.29*** (0.000)	6.91***	(0.0043)

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Notes: All variables in these regressions have been defined in Table 1.

P(value) are shown in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Looking at a group of control variables, our study observes that commercial banks with diversified sources of income have higher loan loss provisions. Perhaps diversifying into areas banks are unfamiliar with can create more risk, so banks need to take more provisions. Therefore, the diversity strategy is not always efficient as expected.

We also find that the larger the commercial banks or the lower equity-to-liability ratio, the lower the provision for loan losses. In other words, large commercial banks tend to accept more risks. Also, when the rate of unemployment increases, commercial banks tend to decline the ratio of loan loss provisions. This trend is explained by the fact that, under the pressure of the State Bank, commercial banks promote more support programs and preferential loans for unemployed people.

In short, there is no significant evidence of different risk levels between listed and unlisted banks. Furthermore, the result shows that state-owned banks are more risk-conscious through a higher level of provision for loan losses.

In conclusion, research results have shown that listed banks operate fairly effectively, using equity resources, generating profits and better performance than unlisted banks. However, the research finds no statistical evidence for the risk-level of listed banks. Hence, listed banks are interested in increasing capital efficiency (ROE) to attract more investment, while risk-taking behavior is not clear.

Besides, commercial banks with state ownership structure did not record a statistically significant correlation with technical efficiency, which differed from some findings of previous studies such as Berger (2005), arguing that the state ownership involves government intervention and political activities, so it is less effective. Although Vietnamese state-owned banks still receive incentives for cheap capital and a large source of customers such as state-owned enterprises, there has not been any statistically significant evidence for better performance of state-owned commercial banks than others. Furthermore, the research results show that the provision for loan losses in state-owned banks is high, which can reduce the risk from bad debts, but limit the capital sources, impacting negatively on bank performance.

Finally, our research finds supporting evidence that the more diversified banks are in terms of sources of income, the more efficiently they use capital, but with low technical efficiency. At the same time, the study results also show that the GDP per capita negatively affects the group of performance variables while not statistically significant on the group of bank risk variables. Economic growth has a positive correlation with operating efficiency (NIM and ROE).

5. Conclusions and recommendations

The paper has examined the impact of state-ownership structure on the risk and performance of Vietnamese commercial banks. We also investigate the role of some macroeconomic factors such as price index, income per capita, unemployment rate and some bank-specific factors such as diversification, financial structure and size of the bank.

The findings show no evidence of technical efficiency or scale efficiency of state-owned commercial banks. Furthermore, these banks are more cautious about risks, setting up greater risk provisions than private banks. Furthermore, we recognize that listed commercial banks are more effective in using equity than unlisted commercial banks.

In summary, our research suggests that listing behavior has a positive impact on bank performance. However, the same positive conclusion cannot be drawn for the state ownership structure variable because there is no significant evidence. Also, when considering the relationship between state-owned structure and bank risk, we explore that state-owned banks have higher loan loss ratios, so higher provisions compared to other banks due to the consequences of poor credit checks and reviews, as well as agency problems such as collective benefits and corruption in state-owned enterprises.

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