

# What Determines the Profitability of Vietnam Commercial Banks?

Duong Thuy Nguyen<sup>1</sup>, Huyen Thanh Ta<sup>1</sup>, Huong Thi Diem Nguyen<sup>1</sup>

<sup>1</sup>Banking Academy of Vietnam, Vietnam

Correspondence: Duong Thuy Nguyen, Banking Academy of Vietnam, Vietnam.

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## Abstract

Kunt and Detragiache (1999) said that the profitability of the banking system was a good indication in signaling financial crisis. Therefore, studying determinants of bank profitability is necessary for better understanding of the current condition of the banking sector, and then, for launching new policies. The research explored determinants of Vietnamese commercial banks' profitability. Using Regression Analysis for Panel Data set of 13 Vietnamese commercial banks over the period from 2006 to 2015, the study found that foreign ownership, cost to income and the level of credit risk, negatively influenced on the profitability of Vietnamese banks, whereas state ownership, size of assets, and macroeconomic factors (GDP and inflation) did not indicated statistically significant relations to the profitability and the relationships between capital structure, liquidity risk and the profitability were mixed.

**Keywords:** ROE, ROA, bank profitability, risk management, ownership structure

## 1. Introduction

The severe impacts of financial crisis and global economic downturn, which the weakness in banking system takes the significant blame for, are still being felt until now and lessons are always being valued. The robustness of the banking sector is an essential condition to ensure the financial stability, because banking is the key element in financial system and plays an important role for economic development. In order to improve banking performance, the prerequisite is to understand the factors that affect their operation results. Examining those affecting factors has not only attracted attentions from scholars, but also from shareholders, managers and authorities, because it helps policy-makers and administrators in formulating adequate strategies and policies to ensure the sustainability and stability in the banking system, thereby avoiding risks of financial crises. Assessing the performance of commercial banks is not easy, because of their diversity. Many researchers have identified that banking profitability may bring an overall picture on banking performance.

Vietnam has bank-based financial market, which is dominated by banks. Vietnam commercial banks become the most important factor in the financial system. However, a number of weaknesses of banks, such as high non-performing loans, unstable liquidity, cross-ownership, poor governance, negatively impacted the performance of banks. The objectives of the paper are to test the influence of internal and external factors on the profitability of Vietnamese commercial banks over the period from 2006 to 2015, from which, to identify statistically most significant factors on the profitability of Vietnamese banks. More particularly, the paper aims are as followed:

- To analyze and evaluate the influence of micro factors on the profitability of Vietnamese commercial banks.
- To analyze and evaluate the influence of macro factors on the profitability of Vietnamese commercial banks.
- To identify whether bank-specific factors and macroeconomic factor significantly influence on the profitability of Vietnamese commercial banks.

## 2. Literature Review

Evaluating business results of a commercial bank as well as determining the factors affecting them is one of the research areas attracting a lot of attention of not only scholars but also shareholders, managers and management body authorities. There are different available approaches to assess the performance of a commercial bank, for example, using analytical limit operation methods or selecting evaluation results for each aspect such as profitability, level of risk, the ability of management, competitiveness, However authors chose the approach based on the evaluation of the profitability of banks. Profit maximization would probably be one the most

commonly cited goal to all business, hence, in commercial banks, evaluating performance is to look at achieved profit level of each bank subjected to their targeted profit. Assessing the profitability of commercial banks is not just the banks consider how to make profit, less or more than other banks? One bank generated higher profit margin than others would not be necessarily good if that bank accepted higher levels of risk instead improving asset quality or cost management. So, besides looking at the profitability of banks, we also need to assess the level of risk they are exposed to. Measuring bank profitability is important not only for bank itself, but also for the supervisory authorities to ensure financial stability.

### ***Ownership structure***

The notion that the ownership structure is one of the determinants of business results of the company has received much attention from economists and finances. Berle and Means (1932) study is credited with laying the important foundation of these issues. They said that a dispersed ownership structure was inversely proportional to the business results of the company. This was due to the differences in managers and shareholders goal. The relationship between ownership structure and business results of the bank has also received attention from researchers recently. According Gürsoy and Aydogan (2002), the impact of ownership structure on the activities of the bank is seen under two aspects: (1) the degree of concentration of ownership, and (2) form of ownership. In term of the degree of concentration of ownership, banks are divided into two categories: centralized and distributed property ownership. In terms of form of ownership, banks are divided into state-owned commercial banks, private banks and foreign banks.

### ***Capital Structure***

According to the theory of corporate governance, financial leverage reduces agency cost created by discretionary expense of managers, thereby affecting the business results of enterprises. Agency cost, due to conflicts of interest between shareholders and management, is the important issue in both financial sector and non – financial sector business operation. This theory said that the selection of appropriate capital structure could reduce the agency cost, according to Jensen and Mekling (1976), the debt can be used to promote the company's management board. The relationship between capital structure and operating results of banks were examined in many studies. Holding the proportion of high equity is costly for banks due to the benefits from debt. According to Modigliani and Miller (1958), investors will expect a higher returns as a higher leverage ratio. This theory is also applicable to the banking sector. Therefore, the bank also has an optimal capital structure which allows it to maximize the value (Berger et al, 1995). However, in view of the balance theory, holding more capital might reduce the risk as well as the risk premium that be require to offset the cost of default by investors (Allen et al, 2011). Banks with a high proportion of capital held would be more likely to survive in the future, and would have a larger motivation in monitoring the borrower, so investors can consider this matter when they look at yield of returns. Bourke (1989) had suggested that the equity ratios which hold by bank had a positive correlation with profitability, because banks had greater equity ratio can easily access to cheap capital and had less risk.

### ***Risk management***

The activities of commercial banks have separate characteristics and profit based on the risk management capabilities of their activities. The impact of risk management systems to the profitability of commercial banks is reflected in the ability of commercial banks to identify and build a reasonable risk appetite. This level of risk appetite will influence and guide all business activities and investments of commercial banks. International audit organizations Earn and Young have pointed out that one of the main reasons causing many banks around the world to suffer severely during the global financial crisis period from 2007 to 2009 is they did not identify and build a reasonable risk appetite. Similarly, KPMG also said that the clear definition of the risk appetite would not only help the commercial banks to control and reduce risk but also be an effective tool to improve the profitability of commercial bank. Nicolae Petria and colleagues also pointed out, effective management of credit risk and liquidity risk will positively affect the performance of banks, in particular increasing ROE.

More specifically, the risk management capabilities of banks are determined by the type of risk that banks faced. According to De Young and Roland (2001), the liquidity risk management capabilities of a commercial bank would ensure the necessary funding to meet the requirements of lenders and bank investment, which helps the commercial banks take advantage of the opportunity to generate the highest level of profitability. Bordeleau and Graham (2010) by using experimental studies for a number of large commercial banks of the Commercial US and Canada have found a same direction correlation between the profit of the commercial bank and the holding of a reasonable level of assets with high liquidity. However, the concept of a reasonable level of highly liquid assets holding depends on the business model that commercial banks selected and the economy status. Besides, the most obvious impact to the profitability of commercial banks is their possibility in credit risk management.

Titus.M.Mboka (2013) said that an efficient credit risk management model would help commercial banks to increase profitability stably through reducing losses in the credit business and increasing market share. However, some quantitative studies showed that the level of credit risk high banking helps banks achieve better profit margins (Kithinj, 2010 and Boahene et al, 2012). This was explained as follows: the customers who were perceived as riskier need to pay higher interest rate, so banks would have higher incomes. Besides monitor closely after bank lending help minimize risk of banks' capital losses.

### ***Total assets***

Emery (1971) and Vernon (1971) was one of the first scholars have studied the relationship between asset size and profitability of the bank. Emery (1971) had found that large banks will earn more profit. Short (1979), Biker and Hu (2002) by qualitative studies have found positive relationships between two variables, because the big banks have had the advantages in the mobilization of resources cheaper capital, thereby reducing the cost of business. Pasiouras and Kosmidou (2007) also made similar statements, to say that the big banks can have the better diversification and higher production efficiency than small banks. However, Vernon (1971) did not find the meaning of this relationship. This also coincides with the findings of Heggsted (1977), Kwast and Rose (1982). Stiroh and Rumble (2006) suggested that this relationship (between bank size and rate of return) was inverse, the larger banks' scale were, the more difficult to manage. Especially, when banks increase the scale to expand horizontally, it would increase costs, not to bring high efficiency. Besides the cost of administrative procedures, staff costs, fixed costs also increased substantially. Like Stiroh and Rumble, Kasman (2010) analyzed data from 431 banks in 39 countries and found the conclusion of the inverse relationship between the scale of bank and its net interest income margin (NIM). Ben Naceur and Goaid (2010) also agreed with this view when conducting research on banks Tunisia.

### ***The economic cycle***

Understanding the relationship between the fluctuations of the business cycle and the profitability of banks plays an important role in assessing the stability and soundness of the banking system and financial system (Saunders and Schumacher, 2000, Biker and Metzmakers, 2003). One of the first studies on the relationship between the profitability of the banks with the macro elements are made by Molyneux and Thomson (1992). They suggested that economic growth was the most important factor affecting the profitability of banks. Many studies then also indicated that the profitability of the banking business is heavily influenced by economic cycles (Laker (1999), Calza et al, 2006)

### ***Inflation rate***

Boyd and colleagues (2000) had studied the impact of inflation on the efficiency of financial markets in more than 100 countries in the period from 1960 to 1995, found that, with low inflation, there was a negative correlation between inflation and credit to the private sector and the bank's assets.

Kunt and Huizinga (1999) in their study found the same dimensional relationship between inflation and the profitability of banks, due to the bank's earnings rose faster than their costs. High Inflation is associated with higher realized interest margins and greater profitability. Banks also benefited from the slow disbursement for customers in terms of high inflation. However, several other studies have questioned the governance costs as inflation increases. Ravell (1979) said that the impact of inflation on the bank's profitability depends on the growth rate of operating expenses (salaries and other expenses) compared to inflation. Perry (1992) argues the same point about the inflationary impacting the profitability of banks depending on expected inflation. If the bank executives predicted the correct rate of inflation, they will adjust interest rates reasonably, the revenue would increase faster than costs, leading to the bank earned more profit. If the prediction is incorrect, the bank will adjust interest rates slow, costs rise faster than income, leading to adverse effects in profitability(Kunt and Huizinga, 1999 and Abreu and Mendes, 2000).

## **3. Research Methodology**

### ***3.1 Variable Selection***

#### ***3.1.1 Dependent Variables***

In most of research about the profitability of commercial banks in all over the world, the proxy for profitability of commercial banks is often ROE (Goddard et al., 2014) and ROA (Athanasoglou et al., 2008). Besides, Kun et al. (1999) used NIM to measure the performance of banks.

ROA, which stands for return on total assets, is the most common ratio used in research of profitability of banks (such as study by Pasiouras et al., 2007, Goddard et al., 2004). ROA showed the result of assets investment, and

more importantly, demonstrated the capabilities of senior executives in the use of financial resources to make profit (Hassan et al., 2003). For each bank, ROA depends on its strategic decisions of the bank and is also influenced by economic factors which the bank cannot control. Rivard et al. (1997) argued that ROA is the best indicator to measure the profitability of banks. Besides, ROA is also the best measure of the ability to generate income of the total assets of the bank. However, the use of ROA faces some limitations, such as ROA excluding off-balance-sheet activities, profit of which was cumulative with the profit of the bank whereas the denominator excluded those items.

ROE, which stands for return on equity, shows the ability to generate profits and added value to shareholders. ROE is considered one of the most comprehensive indicators to evaluate the profitability of commercial banks, because, the ultimate goal of a bank is generally assumed to maximize net assets value, thereby, creating added value for shareholders.

Furthermore, some other empirical studies suggested to use NIM (Net Interest Margin) to measure the profitability of commercial banks. This was because for the majority of commercial banks, net interest income usually accounted for the largest proportion. Thus, for a bank with high net interest margin, its ROA and ROE were usually higher than those of other banks.

With advantages and disadvantages of all of three measures, this research used all of the three variables ROA, ROE, NIM as dependent variables as proxies for profitability of bank.

### 3.1.2 Independent Variables

According to previous literature, these variables are divided into two categories: bank-specific variables and macroeconomic variables (Molyneux et al., 1992; Pasiouras et al., 2007; Athanasoglou et al., 2008 and Dietrich et al., 2011). Bank specific variables are internal factors and are able to be controlled by the managers of banks whereas other factors are external and are not able to be controlled by the managers.

#### 3.1.2.1 Bank Specific Factors

**Capital structure (CAP):** capital structure was defined by using the equity to total assets ratio. Previous literature found mixed results about the relationship between the capital ownership and the performance of a bank. Berger et al. (1995) tested the hypotheses of information and hypotheses of default cost, showing that the high proportion of equity to total assets will increase operational efficiency due to information problems and the reduction of financial distress costs. However, according to the theory of the balance between risk and returns, the high ratio of capital to assets means the lower profitability. A high ratio of capital to assets reduces capital risk, therefore reduces the yield requirements from the investors. Moreover, more equity also leads to the reduction of profit after tax as a consequence of the tax shield decreasing. Thus, this relationship may be positive (+) or negative.

**Ownership structure (FOR, STATE):** Ownership structure of commercial banks represents the share capital contribution of foreign investors. It will influence on business culture, governance culture, operational process, business strategies, the level of market access and other factors which can impact the ability to make profit of commercial banks. The research collected the state ownership rate as well as foreign ownership rate of banks in the data table (STATE and FOR variables). Athanasoglou (2005) pointed out that in developing countries, foreign ownership banks had higher NIM and ROA than domestic banks. In contrast, Kosak and Cok (2008) studied banking systems in Eastern European countries and made a point that the ownership structure did not influence on ROA of banks. Therefore, to test the home advantage hypothesis, the research included dummy variable of foreign ownership rate (DUM\_F) in the model to complement the continuous variables. DUM\_F takes on value of 1 if the bank has foreign ownership and 0 otherwise. Obviously, the level of governance and the operational capacity of Vietnam's banks were much lower than foreign commercial banks and financial institutions. The participation of foreign investors in Vietnam's banks will help these banks to take advantages of experience and management capabilities of the partners to enhance the operating efficiency and profitability. Thus, the research expected the negative impact of state ownership and positive impact of foreign ownership on the profitability of banks.

**Credit Risk (Nonperforming loans – NPL):** For most of Vietnam's banks, credit risk is the most important business, which makes the largest share of profit to banks. Thus, managing lending portfolio efficiently is considered one of the most important factors influencing on the profitability of commercial banks. The level of credit risk and the quality of lending portfolios of banks may be measured by the three following ratio: (i)  $NPL1 = \text{Impaired loans} / \text{gross loans}$ , (ii)  $NPL2 = \text{Loan Loss reserve} / \text{Gross Loans}$ , (iii)  $NPL3 = \text{Loan Loss provisions} / \text{Net interest Revenues}$ . Poor asset quality will result in poor performance of banks because of

increasingly expense to set up reserve negatively impact on the profits of the banks. Thus, this relationship is expected negative.

**Liquidity Risk (LIQ):** Besides credit risk, liquidity risk is one of frequent risk to commercial banking business. Liquidity risk is losses that face banks for not meeting withdrawal demands at reasonable cost. For Vietnam commercial banks, past events indicated the high possibilities of vulnerability to liquidity risk, as evidenced by the liquidity crises and deposit interest rate racing in the banking system in 2008 and 2011. In this research, two following liquidity ratios are considered: (i) LIQ1 = Liquid assets on Deposit and Short-term funding, (ii) LIQ2 = Liquid assets on total Deposit and borrowing. It is expected that these two liquidity ratios negatively influence on the profitability of banks.

Besides the two liquidity ratios above, the ratios of Loans to Total assets (LA) and Deposit and short-term funding to total assets (DEPO) are also considered. The ratio of Loans to Total assets represents income sources, and measures the liquidity of the banks' assets. Higher LA means higher profitability to banks as a result of interest income increasing. However, too high LA also means the banks' liquidity decreasing. DEPO is another indicator measuring liquidity, but on the right side (liabilities and equity) of the balance sheet. According to Trujillo-Ponce (2011), deposit is not as costly as other funds, and is one of stable funds to banks. Thus high proportion of deposit means high operational efficiency. The study of Chu and Lim (1998) showed that big banks may attract more deposit and other funds, resulting in wider net interest margin, whereas small banks regularly raising more funds by buying on interbank market and obviously, more costly than deposit (Lim and Randhawa, 2005).

For the economies with undeveloped financial markets as Vietnam, commercial banks mainly raise funds from deposit to finance business, and lending is the main activity which brings the main income. It is expected that LA and DEPO positively impact on the profitability of banks.

**Scale (SIZE):** The size of commercial banks will affect the competitive position as well as developing potential and making profit as a result of economy of scale. The scale of a bank is reflected by its total assets. Similar to previous study, this research also use normal logarithm of total assets to decrease the skewness of asset distributions. This variable reflects advantages of cost decreasing as a result of economy of scale. Differences in cost as a result of economy of scale may cause positive relationship between size and profitability of banks if the relationship is significant according to the studies of Molyneux and Thornton (1992), Bikker and Hu (2002), Boyd and Runkle (2000), Athanasoglou et al (2008) said that the increase in the size of the credit institutions, for example, the expansion of their market can help banks to save marginal cost. However, too large scale may negatively impact on profitability because of ineffective asset management. Therefore, this relationship may be positive or negative.

**Cost to income (CI):** This is the criterion to measure the performance of the bank. It said costs accounted for what percentage of income. The higher this index, the more inefficient the banks operate, the lower their profits are. This paper expects negative correlation with this variable.

### 3.1.2.2 Macroeconomic Factors

The performance of a bank is sensitive to macroeconomic conditions. Economic growth encourages banks to lend more, allows them to have higher returns and improves asset quality. According to Bikker and Hu (2002), the cyclical changes may occur with the bank's profits.

**The Growth of Gross Domestic Product (GDP):** the banks' profitability depends greatly on the capital demand of the individuals and organizations in the economy. In conditions of high economic growth, banks will have more opportunities to generate profit and increase profitability. Thus, the impact of economic growth on the profitability of the banks has become more obvious. GDP growth is expected to have a positive correlation with the profitability of the bank in this paper, similar to the finding of Pasiouras and Kosmidou (2007).

### Inflation (INF)

**Inflation impacts on the purpose of depositors and borrowers. This, in turn, affects the costs and income or the profitability of banks.** The research selected Consumer Price Index (CPI) to present inflation. Previous studies found mixed findings of the relationship between inflation and profitability. Most of studies found a positive correlation between these two variables (Bourke, 1989, Molyneux and Thornton, 1992). In developing economies, a relative high inflation rate would support the growth and development of the economy as a result of increasing demands for investment. However, too high inflation rate may cause instabilities, raising bad debts, hence reduce the profitability of banks. Therefore, mixed results were expected for this relation.

All of variables which were used in the study were summarized in the following table:

Table 3.1. Lists of variables used

	Variable	Description	Symbol	Expectation
Dependent variable	Profitability	Net profit / Total asset	ROA	
		Net profit / Equity	ROE	
		Net Interest Income / Average Interest Earning Asset	NIM	
Independent variables	Size	Ln(Total Asset)	SIZE	+/-
	Capital ratio	Equity / Total Asset	CAP	+/-
	Credit risk	Impaired loan / Gross loan	NPL1	-
		Loan loss reserve / Gross loan	NPL2	-
		Loan loss provision / Net interest revenues	NPL3	-
	Ownership	State ownership rate	STATE	-
	Structure	Dummy=1 if the bank have foreign ownership, 0 otherwise.	DUM_F	+
	Liquidity	Loan / Total asset	LA	+
		Liquid asset / Deposit & ST funding	LIQ1	-
		Liquid asset / Total deposit & Borrowing	LIQ2	-
		Deposit & ST funding / Total asset	DEPO	+
	Efficiency	Cost to Income	CI	-
	Economic cycle	GDP growth rate	GDP	+
	Inflation	Inflation growth rate	INF	+/-

### 3.2 Data Description and Summary Statistics

Data included annual data of 13 commercial banks over the period from 2006 to 2015, which were taken from the database bank scope by BVD, supplemented by the financial statements of banks. For macro-economic data, the research used data which were collected and calculated from statistical reports and information published by General Statistics Office of Vietnam and State Bank of Vietnam over the period from 2006 to 2015. The banks in the sample have the most complete disclosure data, however, some of them had not been full and some had merged, thus, the research used unbalanced panel data with 118 observations for the final sample.

The descriptive statistics of variables were presented on table 3.3. This table showed that the group of variables reflecting the profitability of Vietnam commercial banks, which included Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM), were at the medium level with the value of 1.19%, 13.26% and 3.33%, respectively. This indicated that the profitability of Vietnam banks were average (As mentioned above, typically, ROA of 1% -2% and ROE of 10% - 20% revealed a medium level for the profitability of the banks). At the same time, the high Standard Deviations of the variables showed the great volatilities of variables during the period of study. More specifically, ROA fluctuated from 0.026% to 2.707%, the variability of ROE was even greater, from 0.305% to 44.253%, whereas the range of NIM was from 0.53% to 7.306%. This was explained by (i) firstly, recent economic shocks significantly impacted on business operations of the banks; (ii) secondly, there were significant gaps between groups of banks in term of capital structure, business capacity, and profitability.

Table 3.2. Summary Statistics

	Mean	Median	Maximum	Minimum	Std. Dev	N
Dependent Variables						
ROA	1.1422735	1.209	2.707	0.026	0.62718984	117
ROE	13.2619573	13.03	44.253	0.305	8.13998114	117
NIM	3.33200855	3.301	7.306	0.53	1.09656186	117
Explanatory Variables						
CAP	9.43222222	8.269	38.675	3.799	4.57889158	117
CI	46.1957692	43.167	87.184	24.412	13.059065	117
DEPO	83.63	84.97	94.03	58.24	6.15775294	117
LA	51.7660342	53.851	80.838	22.005	13.6941884	117
LIQ1	29.3093333	27.681	91.609	7.161	15.1584014	117
LIQ2	29.3025981	28.245	87.989	7.022	14.5665103	107
NPL1	2.26535965	1.877	11.399	0.083	1.73679423	114
NPL2	1.3885812	1.182	4.341	0.013	0.76784915	117
NPL3	17.3760603	14.2365	104.364	-29.937	14.7365099	116
SIZE	11.2678407	11.5601559	13.5663868	7.18692144	1.18390352	110
STATE	13.96	0	100.00	0	30.5246165	118
DUM_F	0.25	0	1	0	0.43728847	118
INF	9.43	7.39	23.12	0.63	6.36035181	118
GDP	6.01	6.00	7.10	5.20	0.61876991	118

<sup>1</sup>Results are based on author's own computation

Regarding explanatory variables, the means of group variables including CAP, DEPO, LA, and SIZE were 9.43%, 83.63%, 51.77%, and 11.27 respectively. With high figure, CAP pointed out that Vietnam banking system generally coped with regulatory requirements of minimum capital adequacy ratio. The high value for the means of DEPO and LA revealed that the main business of the banks was raising funds and lending. However, the figure of 51.77% for loans to assets, which was not too high, indicated that Vietnam banks noticed diversify business to spread risks. The medium standard deviations of these variables showed that the data series were relatively homogeneous and stable. Besides, the means of variables reflecting liquidity including LIQ1 and LIQ2 were 29.31% and 29.30%, respectively. The standard deviations of the two variables, 15.16% and 14.57%, respectively, indicated the high degree of dispersion of the two series.

The means of variables representing assets quality (NPL1, NPL2, NPL3) were 2.27%, 1.39%, and 17.38%, respectively. The high standard deviations (1.74%, 0.77% and 14.74%, respectively) showed the wide dispersion as well as heterogeneous of the data.

Table 3.3. Correlations Matrix

	CAP	CI	DEPO	LA	LIQ1	LIQ2	NPL1	NPL2	NPL3	SIZE	STATE	DUM F	GDP	INF
CAP	1.000	-0.100	-0.484	0.127	0.227	0.258	0.074	-0.153	-0.061	-0.639	-0.256	-0.008	0.086	0.074
CI	-0.100	1.000	0.268	0.089	-0.395	-0.390	0.229	0.038	0.053	0.149	-0.109	0.288	-0.417	-0.264
DEPO	-0.484	0.268	1.000	-0.114	-0.273	-0.207	0.056	0.265	-0.018	0.331	0.060	0.165	-0.331	-0.190
LA	0.127	0.089	-0.114	1.000	-0.594	-0.601	-0.032	-0.029	0.161	-0.128	0.198	0.127	-0.049	-0.149
LIQ1	0.227	-0.395	-0.273	-0.594	1.000	0.992	-0.083	-0.120	-0.255	-0.214	-0.009	-0.244	0.387	0.177
LIQ2	0.258	-0.390	-0.207	-0.601	0.992	1.000	-0.071	-0.099	-0.276	-0.233	-0.034	-0.241	0.355	0.181
NPL1	0.074	0.229	0.056	-0.032	-0.083	-0.071	1.000	0.526	0.333	0.023	-0.054	0.051	-0.179	-0.101
NPL2	-0.153	0.038	0.265	-0.029	-0.120	-0.099	0.526	1.000	0.259	0.410	0.390	0.072	-0.200	-0.043
NPL3	-0.061	0.053	-0.018	0.161	-0.255	-0.276	0.333	0.259	1.000	0.153	0.235	-0.002	0.031	-0.164
SIZE	-0.639	0.149	0.331	-0.128	-0.214	-0.233	0.023	0.410	0.153	1.000	0.527	0.193	-0.223	-0.143
STATE	-0.256	-0.109	0.060	0.198	-0.009	-0.034	-0.054	0.390	0.235	0.527	1.000	-0.008	0.124	-0.008
DUM F	-0.008	0.288	0.165	0.127	-0.244	-0.241	0.051	0.072	-0.002	0.193	-0.008	1.000	-0.204	-0.281
GDP	0.086	-0.417	-0.331	-0.049	0.387	0.355	-0.179	-0.200	0.031	-0.223	0.124	-0.204	1.000	-0.009
INF	0.074	-0.264	-0.190	-0.149	0.177	0.181	-0.101	-0.043	-0.164	-0.143	-0.008	-0.281	-0.009	1.000

*Results are based on author's own computation*

Table 3.3 showed the correlations matrix of explanatory variables. Strong correlations between variables may cause multicollinearity, influencing the efficiency of the estimators. According to Kennedy (2008), the correlations were considered strong when the absolute values of the correlation coefficients were over 0.80. Meanwhile, Anderson, Sweeney and Williams (1990) supposed that the multicollinearity occurred when the correlation coefficients was over 0.7. Basing on these standards, in table 4.4, only LIQ1 and LIQ2 significantly related (with the correlation coefficient of 0.992, however, these two variables will be estimated separately in models. Some noticeable correlations were SIZE and CAP, LIQ2 and LA (with the correlations coefficient over 0.6 to under 0.7). Thus, by testing correlations coefficient, there were not clear signals for multicollinearity.

### 3.3 Model Selection

The research aims to test hypotheses of factors, which include both of micro and macro influencing on profitability of Vietnam commercial banks. Using Panel data set is the most reasonable method with a range of advantages such as raising the number of data points, partly overcoming the multicollinearity, and being able to address many important questions that cross-sectional or time series data set cannot. It also allows the study to look at the problems of heterogeneity, uncertainty of each bank in the sample of data. Population regression equation is used in the research:

$$\text{PROF}_{it} = \beta_0 + \beta_1 \text{STATE}_{it} + \beta_2 \text{DUM\_F}_{it} + \beta_3 \text{CAP}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{CI}_{it} + \beta_6 \text{NPL}_{it} + \beta_7 \text{LIQ}_{it} + \beta_8 \text{GDP}_{it} + \beta_9 \text{INF}_{it} + \varepsilon_{it}$$

With,  $\text{PROF}_{it}$  represented dependent variables including ROA, ROE, NIM. Proxies for credit risk (NPL1, NPL2, NPL3) as well as those for liquidity risk (LIQ1, LIQ2, DEPO, LA) will be put in turn into the regressive model. As a result, there would be twelve models for each dependent variable with various combination of credit risk and liquidity risk independent variables.  $\varepsilon_{it} \sim \text{i.i.d.}(0; \sigma_{\varepsilon}^2)$ ;  $\sigma_{\varepsilon}^2 = \sigma_{\varepsilon}^2 \forall i$ ;  $\text{Cov}(\varepsilon_{it}, \varepsilon_{jt}) = 0$  when  $i \neq j$ .

Pool OLS estimation will be run first. Pool OLS ignores time and cross-section effects, thus, fixed effects model (FEM) and random effects model (REM) would be used (Maudos and Fernandez, 2004). To compare the efficiency of the two models (fixed effects model and random effects model), Hausman test was performed with the help of Eviews.

Table 3.4 summarised the results of Hausman tests, which was taken from a number of models with three dependent variables (ROA, ROE, NIM, respectively). As can be seen from the table, the fixed effects models

were more efficient for two regressions with NIM as dependent variables, and two combinations of NPL1 and DEPO, NPL1 and LA as independent variable, respectively, (the prob-value of under 5%) whereas the random effects model was more efficient for the remaining (the prob-value of over 5%).

Table 3.4. The result of Hausman Test

	ROA		ROE		NIM	
	Chi-S	Prob	Chi-S	Prob	Chi-S	Prob
NPL1, LIQ1	14.25273	0.1136	9.792869	0.3675	14.8145	0.0962
NPL1, LIQ2	13.63337	0.136	9.979473	0.3521	15.82242	0.0707
NPL1, DEPO	11.82388	0.2234	6.182304	0.7215	25.37758	0.0026
NPL1, LA	8.935212	0.4433	6.800709	0.6579	24.30073	0.0039
NPL2, LIQ1	7.686776	0.566	5.694026	0.7701	4.974808	0.8365
NPL2, LIQ2	7.294443	0.6065	5.459549	0.7926	5.941547	0.7458
NPL2, DEPO	10.54988	0.3078	5.435087	0.7949	8.72726	0.4628
NPL2, LA	6.198607	0.7199	5.765426	0.7631	7.713666	0.5632
NPL3, LIQ1	6.487596	0.6903	7.748867	0.5596	7.088527	0.6279
NPL3, LIQ2	7.646947	0.5701	9.816829	0.3655	7.154313	0.6211
NPL3, DEPO	11.29995	0.2557	5.08142	0.8272	9.525343	0.3903
NPL3, LA	7.397701	0.5958	10.00427	0.3501	9.248809	0.4146

(Note: Results are based on author's own computation)

#### 4. Empirical Results

Table 4.1, 4.2, 4.3 showed the results of regressions which explored the determinants of profitability of banks:

Table 4.1. Summary of Results of Regressions of determinants of ROA

ROA	Model 1 (REM)	Model 2 (REM)	Model 3 (REM)	Model 4 (REM)	Model 5 (REM)	Model 6 (REM)	Model 7 (REM)	Model 8 (REM)	Model 9 (REM)	Model 10 (REM)	Model 11 (REM)	Model 12 (REM)
	3.4271**	3.5402**	4.1157**		3.4958**	3.5452**	4.1396**		3.4905**	3.3642**	4.0784**	3.2753**
	*	*	*	2.3099**	*	*	*	2.4785**	*	*	*	*
C	(4.0134)	(4.0027)	(3.5184)	(2.4619)	(3.9102)	(3.7978)	(3.5012)	(2.5897)	(4.9355)	(4.6454)	(4.4316)	(3.8021)
STAT	-0.0022	-0.0021	-0.0024	-0.0038	-0.0030	-0.0029	-0.0025	-0.0038	-0.0009	-0.0008	-0.0006	-0.0073
E	(-1.0508)	(-0.9753)	(-1.0770)	(-1.6480)	(-1.0929)	(-1.0379)	(-1.0309)	(-1.4316)	(-0.3749)	(-0.3633)	(-0.2996)	(-1.3199)
				-0.2104*				-0.2351*		-0.1623*	-0.1566*	-0.2331*
DUM_	-0.1354	-0.1387	-0.1354	*	-0.1574	-0.1523	-0.1459	*	-0.1766	*	*	*
F	(-1.4375)	(-1.4197)	(-1.4381)	(-2.2149)	(-1.6051)	(-1.4857)	(-1.5416)	(-2.4045)	(-2.3004)	(-2.0530)	(-2.1153)	(-2.7701)
	0.0031	0.0022	-0.0027	0.0029	-0.0016	-0.0019	-0.0048	0.0001	0.0064	0.0085	0.0023	0.0013
CAP	(0.3134)	(0.2152)	(-0.2319)	(0.2962)	(-0.1544)	(-0.1768)	(-0.4031)	(0.0108)	(0.7889)	(1.0346)	(0.2449)	(0.1491)
	-0.0073	-0.0137	-0.0112	0.0278	-0.0103	-0.0150	-0.0168	0.0196	0.0012	0.0067	-0.0001	-0.0017
SIZE	(-1.1401)	(-0.2547)	(-0.2134)	(0.5236)	(-0.1812)	(-0.2533)	(-0.3047)	(0.3487)	(0.0266)	(0.1468)	(-0.0026)	(-0.0337)
	-0.0380*	-0.0381*	-0.0375*	-0.0378*	-0.0384*	-0.0386*	-0.0380*	-0.0379*	-0.0379*	-0.0382*	-0.0373*	-0.0369*
	**	**	**	**	**	**	**	**	**	**	**	**
CI	(-11.515)	(-11.401)	(-11.131)	(-11.678)	(-11.427)	(-11.310)	(-11.312)	(-11.535)	(-14.536)	(-14.675)	(-14.275)	(-13.520)
	0.0047	0.0048	0.0041	0.0080	0.0054	0.0053	0.0048	0.0087	0.0008	0.0003	-0.0002	0.0024
INF	(0.8204)	(0.8237)	(0.7115)	(1.4150)	(0.9474)	(0.9066)	(0.8374)	(1.5327)	(0.1759)	(0.0604)	(-0.0435)	(0.5275)
	-0.0701	-0.0772	-0.0823	-0.0330	-0.0740	-0.0732	-0.0839	-0.0429	-0.0568	-0.0402	-0.0755	-0.0389
GDP	(-1.0958)	(-1.1810)	(-1.2820)	(-0.5337)	(-1.1629)	(-1.1032)	(-1.3174)	(-0.6941)	(-1.1404)	(-0.7839)	(-1.5227)	(-0.7796)
	-0.0217	-0.0212	-0.0220	-0.0190								
NPL1	(-1.1194)	(-1.0813)	(0.2595)	(-1.0010)								
					-0.0094	-0.0025	-0.0086	-0.0229				
NPL2					(-0.1502)	(-0.0395)	(-0.1440)	(-0.3831)				
									-0.0156*	-0.0160*	-0.0155*	-0.0149*
									**	**	**	**
NPL3									(-7.8342)	(-7.9433)	(-7.9255)	(-7.1892)
	0.0003				0.0008				-0.0009			
LIQ1	(0.0993)				(0.2679)				(-0.3552)			
		0.0005				0.0009				-0.0019		
LIO2		(0.1662)				(0.2610)				(-0.7260)		
			-0.0063				-0.0057				-0.0057	
DEPO			(0.3918)				(-0.7692)				(-0.9795)	
				0.0097**				0.0096**				
				*				*				0.0040
LA				(2.7563)				(2.5538)				(1.0653)

(\*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively)



Table 4.2. Summary of Results of Regressions of determinants of ROE

ROE	Model 1 (REM)	Model 2 (REM)	Model 3 (REM)	Model 4 (REM)	Model 5 (REM)	Model 6 (REM)	Model 7 (REM)	Model 8 (REM)	Model 9 (REM)	Model 10 (REM)	Model 11 (REM)	Model 12 (REM)
	29.9951*	29.4416*	51.9592*	33.4406*	31.4608*	30.1909*	52.2545*	35.2114*	31.4285*	27.9573*	52.0242*	37.4302*
	*	*	**	*	**	*	**	*	**	**	**	**
C	(2.5994)	(2.4581)	(3.1675)	(2.4539)	(2.6425)	(2.4142)	(3.1552)	(2.5749)	(3.2664)	(2.8244)	(3.8789)	(3.4492)
STAT	-0.0018	-0.0006	0.0040	0.0046	-0.0078	-0.0070	0.0061	0.0081	0.0235	0.0222	0.0328	0.0379
E	(-0.0586)	(-0.0201)	(0.1138)	(0.1278)	(-0.2091)	(-0.1814)	(0.1608)	(0.2094)	(0.7934)	(0.7756)	(1.0905)	(1.3509)
DUM	-2.8837*	-2.8964*	-3.4851*	-3.7421*	-2.9972*	-2.9655*	-3.6281*	-3.9024*	-3.2197*	-3.0392*	-3.6356*	-3.6112*
	*	*	**	**	*	*	**	**	**	**	**	**
_F	(-2.2685)	(-2.1931)	(-2.6299)	(-2.7078)	(-2.2963)	(-2.1620)	(-2.7292)	(-2.7923)	(-3.0679)	(-2.8031)	(-3.3686)	(-3.2606)
	-0.6200*	-0.6252*	-0.7093*	-0.5736*	-0.6473*	-0.6451*	-0.7200*	-0.5903*	-0.5390*	-0.5137*	-0.6295*	-0.5036*
	**	**	**	**	**	**	**	**	**	**	**	**
CAP	(-4.6178)	(-4.5426)	(-4.3380)	(-4.0557)	(-4.7105)	(-4.5455)	(-4.3220)	(-4.1349)	(-4.8455)	(-4.5289)	(-4.6620)	(-4.3974)
	0.6278	0.6385	0.1470	0.2554	0.5186	0.5737	0.0808	0.1998	0.6704	0.8337	0.2411	0.2811
SIZE	(0.8849)	(0.8660)	(0.1966)	(0.3297)	(0.6828)	(0.7195)	(0.1035)	(0.2482)	(1.1151)	(1.3528)	(0.3919)	(0.4542)
	-0.3874*	-0.3892*	-0.3879*	-0.4040*	-0.4004*	-0.4040*	-0.3947*	-0.4080*	-0.3936*	-0.3981*	-0.3889*	-0.4037*
	**	**	**	**	**	**	**	**	**	**	**	**
CI	(-8.7382)	(-8.6827)	(08.1984)	(-8.6519)	(-8.9552)	(-8.8581)	(-8.3577)	(-8.7058)	(-10.989)	(-11.091)	(-10.208)	(-10.876)
	0.0301	0.0305	0.0325	0.0540	0.0332	0.0320	0.0421	0.0623	-0.0228	-0.0290	-0.0238	-0.0138
INF	(0.3969)	(0.3948)	(0.4091)	(0.6676)	(0.4366)	(0.4106)	(0.5304)	(0.7678)	(-0.3673)	(-0.4600)	(-0.3631)	(-0.2065)
	-0.4283	-0.3241	-0.1502	0.2481	-0.4830	-0.3228	-0.2323	0.0997	-0.2773	0.0985	-0.1008	0.1859
GDP	(-0.5020)	(-0.3713)	(-0.1689)	(0.2802)	(-0.5708)	(-0.3649)	(-0.2627)	(0.1133)	(-0.4042)	(0.1389)	(-0.1402)	(0.2626)
	-0.3269	-0.3258	-0.3479	-0.3191								
NPL1	(-1.2649)	(-1.2434)	(-1.2888)	(-1.1724)								
					0.0341	0.0058	-0.4232	-0.5337				
NPL2					(0.0409)	(0.0068)	(-0.5001)	(-0.6254)				
									-0.1898*	-0.1956*	-0.1988*	-0.2007*
									**	**	**	**
NPL3									(-6.9431)	(-7.0348)	(-7.0059)	(-7.0747)
	0.1197**				0.1253**				0.1001**			
	*				*				*			
LIO1	(3.0848)				(3.0502)				(3.0690)			
		0.1226**				0.1272**						
		*				*				0.0897**		
LIO2		(2.9539)				(2.8607)				(2.2536)		
			-0.1644				-0.1525				-0.1567*	
DEPO			(-1.5968)				(-1.4624)				(-1.8516)	
				0.0081				0.0069				-0.0252
LA				(0.1538)				(0.1272)				(-0.6035)

(\*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively)

Table 4.3. Summary of Results of Regressions of determinants of NIM

NIM	Model 1 (REM)	Model 2 (REM)	Model 3 (FEM)	Model 4 (FEM)	Model 5 (REM)	Model 6 (REM)	Model 7 (REM)	Model 8 (REM)	Model 9 (REM)	Model 10 (REM)	Model 11 (REM)	Model 12 (REM)
C	5.0519** (2.4748)	4.8635** (2.3124)	1.6939 (0.5403)	-3.2112 (-1.3571)	4.6318** (2.2269)	4.4896** (2.0813)	3.6709 (1.3077)	-1.0241 (-0.5029)	4.4627** (2.2103)	4.0888* (1.9481)	2.6707 (0.9545)	-1.4306 (-0.7013)
STAT	0.0001 (0.0207)	-0.0005 (-0.0966)	-0.0040 (-0.2377)	0.0045 (0.3060)	-0.0027 (-0.3483)	-0.0036 (-0.4825)	-0.0052 (-0.7124)	-0.0084 (-1.2438)	0.0024 (0.3372)	0.0010 (0.1459)	-0.0006 (-0.0850)	-0.0049 (-0.7303)
E				-0.8116**				-0.6045**				-0.6404**
DUM_	-0.3547 (-1.5805)	-0.3360 (-1.4511)	-0.4464* (-1.8056)	* (-3.5803)	-0.3638 (-1.6074)	-0.3816 (-1.6225)	-0.2260 (-1.0011)	* (-2.9067)	-0.4321* (-1.9789)	-0.4351* (-1.9107)	-0.2879 (-1.2778)	* (-3.0716)
F	0.0457* (1.9363)	0.0498** (2.0701)	0.0421 (1.3189)	0.0498** (2.1073)	0.0374 (1.5773)	0.0401 (1.6551)	0.0317 (1.1185)	0.0362* (1.7264)	0.0545** (2.3573)	0.0594** (2.5023)	0.0505* (1.7829)	0.0484** (2.2808)
CAP				0.4396**								0.3701**
SIZE	0.0994 (0.7852)	0.1151 (0.8841)	0.2811* (1.8324)	* (3.2055)	0.0832 (0.6218)	0.1002 (0.7232)	0.1391 (1.0390)	0.2846** (2.3680)	0.1458 (1.1434)	0.1766 (1.3314)	0.2493* (1.9129)	* (3.1607)
CI	-0.0310** (-3.9885)	-0.0308** (-3.9403)	-0.0286** (-3.2258)	-0.0249** (-3.3459)	-0.0332** (-4.3038)	-0.0328** (-4.2030)	-0.0326** (-4.0617)	-0.0288** (-4.1694)	-0.0300** (-4.0507)	-0.0295** (-3.9446)	-0.0284** (-3.5810)	-0.0250** (-3.6636)
INF	0.0178 (1.3428)	0.0176 (1.3085)	0.0156 (1.1282)	0.0296 (2.4159)	0.0154 (1.1889)	0.0160 (1.2197)	0.0118 (0.8875)	0.0262** (2.2311)	0.0125 (0.9793)	0.0122 (0.9462)	0.0091 (0.6809)	0.0241** (1.9986)
GDP	-0.2100 (-1.4099)	-0.2132 (-1.4034)	-0.2442 (-1.5518)	-0.1155 (-0.8469)	-0.1587 (-1.1005)	-0.1777 (-1.1868)	-0.2353 (-1.5882)	-0.1105 (-0.8649)	-0.1600 (-1.1366)	-0.1621 (-1.1077)	-0.2631* (-1.7791)	-0.1441 (-1.1203)
NPL1	-0.0014 (-0.0311)	-0.0027 (-0.0598)	0.0042 (0.0869)	-0.0006 (-0.0143)				0.3885**				
NPL2					0.3022** (2.0643)	0.3053** (2.0709)	* (2.6858)	0.3282** (2.5787)				
NPL3									-0.0160** (-2.8375)	-0.0170** (-2.9411)	-0.0141** (-2.4039)	-0.0102* (-1.9521)
LIQ1	-0.0227** (-3.2876)				-0.0183** (-2.5339)				-0.0239** (-3.4964)			
LIQ2		-0.0239** (-3.2684)				-0.0184** (-2.3855)				-0.0247** (-3.3329)		
DEPO			0.0098 (0.5073)				0.0024 (0.1328)				0.0062 (0.3471)	
LA				0.0535** (5.2081)				0.0460** (5.4842)				0.0454** (5.3635)

( , \* , \*\* , \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively)

#### 4.1 The Impact of Bank-specific Factors on the Probability of Vietnam Commercial Banks

**Ownership structure (FOR, STATE):** The results of regressions showed that there were no statistically significant relationship between the state ownership and the profitability of Vietnamese banks. For the effect of foreign ownership, the results of regressions showed that the foreign ownership negatively impacted on ROE in all of twelve models with various combinations of credit risk and liquidity risk independent variables. For the models with NIM and ROA as dependent variables, the study found the negative relationship between foreign ownership and ROA or NIM in six of twelve models. The coefficients of foreign ownerships in the remaining regressions were also negative but not statistically significant. These findings were contrary to study by Claessens et al. (2001), which found that foreign ownership contributed to reduce inefficiencies of banks. The previous study by KieuHuuThien et al. (2014) suggested that the effects of foreign ownership were not really obvious. It seemed that, in Vietnam, foreign ownership banks still did not take their advantages of modern technology and management capacity. Besides, this may be because the participations of foreign investors in the corporate governance and management of Vietnam banks were insignificant, resulting in their influence on the operations of banks also being limited. Decree 01/2014/DECREE-GOV, which replaced Decree 69/2007/DECREE-GOV, raised foreign ownership ratio of companies to 30%, in which, the ownership ratio of one foreign institution must not exceed 15%, except for strategic investors (applying the ceiling ratio of 20%). These limitations caused foreign investors difficulties to engage the Board of Directors. Besides, the short periods of engagement and low ownership ratios led to their role very faint.

**Capital structure (CAP):** The regression revealed the positive relations between the equity to total assets ratio

and NIM in eight of twelve models. These results were consistent with some previous studies in emerging economies, a high rate of equity to total assets meant high profitability, by Athanasoglou et al. (2008) and Pasiouras and Kosmidou (2007). The theory argued that in cases of asymmetric information between managers and investors, lower-risk banks would have advantages of transmitting their positive signals through a high ratio of equity to total assets. Other researches emphasized that in developing countries the amount of equity was one of top concerns by depositors, hence, banks with more equity would attract lower-yielded and more stable deposits, which, in turn, would positively impact on their profits, especially their NIM. These positive relations also proved that the franchise-value hypothesis was right in case of Vietnam commercial banks. Efficient banks increasingly tend to choose holding more equity to earn profit as a result of high efficiency.

However, the similar relations did not find in the models with the dependent variable ROA whereas regressions with ROE as dependent variable showed reverse relations. The changes in capital holding ratio negatively impacted on ROE of Vietnam banks. These results were opposed to theories of positive relation between capital adequacy and profitability. The contradicting effects of CAP on NIM and ROE pointed out that Vietnam banks effectively take advantages of high capital adequacy to attract lower-yielded and more stable deposits in raise their NIM but cannot raise their ROE. This may explained by study of Bensaid (1995). Accordingly, the way for bank to deal with moral hazard caused banks' profit depending on unobservable decision. The study results may attribute to the fact that the study period was also the difficult period of Vietnam banks, when the growth rate declining led to corporations to refrain from business investment. This, accompanied by high NPL rate, caused ROE of banks over this period (2011-2015) to decrease significantly compared to those during the previous period. The evidence was that the average of ROE of banks in the sample was only 13.26% whereas that figure was 16.79% over the previous period from 2006 to 2010. Meanwhile, new regulations (Circular 13/2010/CIR-SBV and Circular 36/2014/CIR-SBV) forcing banks to raise CAR from 8% to 9% might cause negative relations as shown in the model.

**Size of Assets (SIZE):** The results of estimation pointed out the positive relation between the size of Vietnam banks and their NIM in only five of twelve models. For models with ROE or ROA as dependent variables, the study did not find any statistically significant relationships between size and profitability of bank. The unclear impact of the variable scale on the profitability of banks may be explained basing on the study of Berger et al. (2008). The study argued that this was due to group effects of state commercial banks. In Vietnam, state-hold-dominant-share banks were also the largest banks. However, as explained above, the profitability of these banks was instable and tend to decrease partly due to pressures to lend inefficient state corporations. The results of estimation for variable SIZE were also explained by the fact that in the past period, small banks and newly established banks usually tend to focus on increasing scale and ignore the quality of lending portfolios, which negatively impact on their profitability. The trends of merge and acquisitions have occurred recently and still have not caused positive influences.

**Operational Efficiency (Cost to Income - CI):** Cost to income was determined negatively related to the profitability of banks for all of models with various dependent variables at the very high level of statistical significance, which was consistent with studies of Molyneux and Thornton (1992), Athanassoglou (2006). This proved that cost management was one of the most important factors impacting on the profitability of banks. This proxy indicated operational efficiency of banks, with low value equivalent to high operational efficiency. The estimators showed that the more efficient the banks were, the higher their profitability was. Athanasoglou et al. (2008) found the similar results. In Vietnam, in the period of overheating growth, the income of most banks rose sharply, however, the related costs also tend to increase. Only institution managing their costs efficiently can keep the pace of costs increase slower than that of income increase, ensuring profit earning.

**Credit Risk (Non-performing loans NPL):** The study pointed out negative and statistically significant relationship between NPL3 and the profitability of banks in all of model with NPL3 as independent variables. NPL2 also negatively and statistically significantly influenced on NIM. However, the research could not found any similar relations between NPL1 and the profitability of banks. These were consistent with study of Athanasoglou et al. (2008). This was explained easily that increasing bad debts would cause bank to increase expense to reserve, hence, the profit of banks would decrease. However, the similar relations did not found in the regressing models with independent variables NPL1 as well as NPL2. This may be explained by the context of Vietnam in and after the crisis. The influence of the crisis on Vietnamese banks was quite late, from 2012 with a period of continuous drops of profits and increase of nonperforming loans. Traditionally, Vietnamese banks were required to hold the NPL rate under 3%, hence, most of banks were not ready to disclosure their real NPL rate. Also, Vietnamese banks had been allowed to use loan loss reserve to write off uncollectible debts (balancing the uncollectible debts by their loan loss reserve). This, in turn, improved the NPL rate (impaired loans/gross loans)

of banks and became one of favorite method of some banks to decrease the NPL rate. This reaction of banks caused both of the NPL rate, specifically NPL1 (impaired loans/gross loans), to decrease and not to be able to a reliable measure for credit risk. This also partly changed NPL2 (loan loss reserve/gross loans) whereas NPL3 (Loan loss provision/Net interest revenues), in contrast, was not noticeable influenced by this reaction and became the most reliable and effective to measure credit risk.

**Liquidity Risk (LIQ):** Besides Credit risk, liquidity is also a top concern by banks. In theory, most of studies pointed out the negative relation between liquidity and profit of banks. Improved liquidity meant that the proportion of liquid assets, which always yield lower income, increased, reducing the profit of banks. The study found negative relation between LIQ1 and LIQ2 to NIM in all of twelve models and positive relation between LIQ1 and LIQ2 to ROE in models with ROE as dependent variables. The research continued to consider the impact of other liquidity variable such as DEPO and LA. LA was found that positively influence on the profitability of banks (all of models with ROA and NIM as independent variables) whereas the influence of DEPO on the profitability of bank was not statistically significant. This was contrary to the finding of Athanasoglou et al. (2008). All of these differences can be explained by in Vietnam, in period of severe liquidity as a result of financial crisis, banks competed by interest rate and continuously exceed ceiling interest rates of raising funds. This contributed to distort the picture of the profitability of Vietnam banks.

#### *4.2 The Impact of Macroeconomic Factors on the Profitability of Vietnam Commercial Banks*

**Economic growth (GDP):** Economic growth was expected that positively to impact on the profitability of banks. However, the regression model did not show any statistically significant relations similar to previous studies between GDP and the profitability of Vietnamese banks.

**Inflation ratio (INF):** The coefficients for variable INF were positive in only three of twelve models with dependent variable NIM at statistical significance of 5% and the same signs in models with dependent variable ROA and ROE but not statistically significant. The positive signs may be explained by the influence of inflation expectations of customers, which revealed that abnormal profits may be made as a result of asymmetric information. These results were consistent with the finding of Greek banks by Panayiotis et al. (2005).

### **5. Conclusion**

The research explored determinants of profitability of Vietnam commercial banks. Factors influencing the profitability of Vietnamese banks were divided into two categories: bank-specific factors and macroeconomic factors. Using Regression Analysis for Panel Data set of Vietnam commercial banks over the period from 2006 to 2015, the study found the following:

- There were no statistically significant relationship between the state ownership and the profitability of Vietnamese banks, whereas the foreign ownership may negatively influence on their profitability.
- Capital structure was positively related to NIM of a bank but negatively related to ROE. This was explained by the research context, which NPL rate of Vietnamese banks continuously increased, the banks had to set up significant amount of provision, leading to their profits and ROEs decreased whereas their CAR increased under new regulations.
- Size of Assets did not have clear relationship with the profitability of Vietnamese banks.
- Cost to income is one of the most effective determinants of profitability of Vietnamese banks. It revealed an obvious negative relation to the profitability of Vietnam banks at very high level of confidence.
- NPL3 (Loan loss provision/Net interest revenues) was the most effective measures of credit risk of Vietnamese banks whereas nonperforming loan rate and loan loss reserve on gross loans were not. The level of credit risk (which measured by NPL3) negatively impacted on the profitability of Vietnam banks.
- Competition on mobilization interest rates among banks over the study period distorted the relationships between liquidity risk and the profitability of Vietnamese banks. In general, improved liquidity (increase in LIQ1 and LIQ2, and decrease in LA) negatively influenced on NIM, decrease in LA also led to ROA declining. However, increase in LIQ1 and LIQ2 resulted in ROE rising.
- Regarding macroeconomic factors, the regression modeled did not reveal obvious relationship between macroeconomic factors (GDP and INF) and the profitability of Vietnamese banks.

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<sup>i</sup>CAP = equity/total assets; SIZE = ln(total assets); CI = Cost to Income; DEPO = Deposit & Short-term funds/ Total assets; LA = Loans/ Total assets; LIQ1 = Liquid assets/ Deposit & Short-term funding; LIQ2 = Liquid assets/ Total deposit & Borrowing; NPL1 = impaired loans/gross loans; NPL2 = Loan loss reserve/ Gross loans; NPL3 = Loan loss provisions/ Net interest revenues; STATE = state ownership rate; DUM\_F = Foreign ownership rate (Dummy); INF = Inflation rate; GDP = Growth rate of Gross Domestic Products

<sup>ii</sup>CAP = equity/total assets; SIZE = ln(total assets); CI = Cost to Income; DEPO = Deposit & Short-term funds/ Total assets; LA = Loans/ Total assets; LIQ1 = Liquid assets/ Deposit & Short-term funding; LIQ2 = Liquid assets/ Total deposit & Borrowing; NPL1 = impaired loans/gross loans; NPL2 = Loan loss reserve/ Gross loans; NPL3 = Loan loss provisions/ Net interest revenues; STATE = state ownership rate; DUM\_F = Foreign ownership rate (Dummy); INF = Inflation rate; GDP = Growth rate of Gross Domestic Products<sup>ii</sup>

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