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DETERMINANTS OF PROFITABILITY IN COMMERCIAL BANKS: CASE OF VIETNAM

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ABSTRACT

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Title: DETERMINANTS OF PROFITABILITY IN COMMERCIAL BANKS: CASE OF VIETNAM

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The financial system of Vietnam's economy considers the banking system as the engine for its development and the growth of economy just like other countries in the world. Similar to most other private sectors, in order to sustain and develop the business, commercial banks need to earn and maintain positive and growing profitability. However, in the volatile business environment and during the economic transitional stage, banking sector tends to suffer unstable profitability and declining performance. Therefore, this research is carried out with the purpose to investigate which factors are the key determinants or driver of the profitability of commercial banks in Vietnam in the past 10 years. By reviewing prior studies and evidence from different countries and regions in the world, this research is going to supplement the current studies in Vietnam with a more potential factors that can potentially drive the profitability of local banking sectors. Internal factors such as financing structure, assets structure, asset quality, capitalization, operating efficiency, size of bank and income diversification will be studied in relation with profitability. Besides internal factors, external or macro-economic factors such as GDP growth rate, inflation rate and market concentration are also taken in to evaluation. This research contributes to existing literature by introducing the role diversification, non-performing loans, operating efficiency and banking sector concentration level in the context of Vietnam. Multiple linear regression for balance panel data will be employed to serve the purpose of this research. Data includes 16 largest banks in Vietnam during the period of 10 years from 2007 to 2016. The outcomes are relatively mixed. While it suggests the significant effect of market concentration level, the importance of capitalization, the ability to manage the banks effectively and control non-performing loans, there is not enough evidence to support the benefit of income diversification. Besides, the loans level and bank size are found to be not relevant in the context of Vietnam.

TABLE OF CONTENTS

ABBREVIATIONS

CPI	Consumer Price Index
GDP	Gross domestic product
INF	Inflation rate
NPLs	Non-performing loans
NIM	Net interest margin
ROA	Return on Asset
ROE	Return on Equity
SBV	State Bank of Vietnam
U.S.A	United States of America
VND	Vietnam Dong

TABLES AND FIGURES

INTRODUCTION

1.1 Research background

1.1.1 Commercial banks

The banking sector's role is highly crucial in the financial system of a country as well that country's economy. It plays a key role in the development of different industries especially trading, import and export industry. Banks are not only playing the role of a wealth keeper but also as a financial institution who provide resources for the economy which is extremely important in any countries. Besides, commercial banks also act as a channel to carry out the Central Bank's monetary and financial policies.

In general, the core role of banking sector is acting as a provider of financial services to different industries and sectors while helping authorities to ensure a stable growth of a country's financial system and economy. Its role is even more important especially in the case of developing economies.

Taking a look back at the global economic history, most of economic crises such as 1997 financial crisis in Asia or 2008 in global scale were the result of a poor and failed financial system. 1997 financial crisis started from Thailand then spread to neighboring countries as a result of economic bubble and inefficient banking sector. In 2007 – 2009 period, the financial crisis in global scale resulted from the collapse of Lehman Brother (1850 – 2008) in the United States of was also an obvious evidence for this risk of a poor financial regulation. Hence, the banking sector can be seen as the most vital determinant of an economy's growth and stability and need to be carefully examined.

The banking sector's good performance will be a boost for the development of an economy especially developing countries while its failure will put the whole economy in a potential crisis.

1.1.2 Role of banking sector in developing countries.

In order to fully understand the role of commercial banks in the context of a developing country or country with a developing economy, it is important to have a sound knowledge of characteristics of a developing country. The developing countries is generally understood implicitly as countries with low income per capita (McConnell et al., 2013). Although this is just one of different defining characteristics of a developing country, it is the most important factors to consider. According to McConnell et al., (2013), developing countries with low rate of income per capita usually result in low savings and investment which in turn can impair the productivity of the economy in general. Another relevant characteristic is the high rate of unemployment due to the poor performance of the economy. Overpopulation together with high unemployment rate typically create an ideal environment for different social evil issues to happen. Besides, the economy of developing countries usually relies heavily on few non-industrial field and raw material export. For example, most countries in South, East and Southeast Asia such as Vietnam, Bangladesh, Philippines are still Agriculture-based economies. Many countries earn a majority of income from exporting raw material and commodities. Last but not least, the financial system of a developing country is quite underdeveloped, vulnerable and it usually requires high intervention from the government. Different aggressive financial and monetary policies need to be well and in time delivered to best support and monitor the young financial system.

As a result, the role of banking sector in the context of a developing economy is quite crucial. With its core function as a financial intermediary, a commercial bank stimulates the capital formation by accumulating deposits from depositors and converting those funds into loans to customers in need from in different industries. As export and import play a huge part in the national income, commercial banks create strong infrastructures and services to facilitate smooth

payment and foreign trade activities. Banks help local companies to be able to carry out transactions with offshore customers and partners instantly with strong profession. As commercial banks facilitate the business growth and investment in different industries, more job opportunities for local community will be created. As the financial systems of these countries are quite underdeveloped and vulnerable to crisis and fluctuation, banks act the executives of government policy in delivering monitoring policy to ensure the stability of the economy, reduce inflation and deflation risk etc.

Therefore, a healthy and efficient banking sector can have a decisive role in economic development of a developing country (Da Rin & Hellmann, 2002). This belief is well aligned with prior findings King & Levine (1993) and Levine & Zervos (1998) which stated that there is correlation between the growth of bank lending in an economy and the prospective economic growth.

1.1.3 Current landscape of the banking sector in developing country

Unlike banking sector industrially advanced countries, the commercial banks markets in developing countries are quite fragmented especially in South and Southeast Asia. There are always a vast number of small commercial banks in the economy while there are only a few giant banks who occupy most of the market shares (BIS, 2001). Those giant banks are, in many cases, state-owned banks or partly-state-owned banks. These banking sectors are usually highly subsidized by government. For instance, there are always an interest rate ceiling or a specific limitation in lending or depositing rate. Hence, commercial banks do not always have to deal with fluctuation or competition while being backed by the central banks. There was rarely any bankruptcy allowed in those countries due to heavy protection from the State government. Inefficiency, Credit risk and bad debt have become an increasingly serious issue without

enough attention. Their earning came stably and significantly from the difference between controlled deposit and lending interest rates.

For a long time, this tradition took place in many developing economies including Vietnam. They did not see any significant pressure for restructuring and improvement. However, according to the report of Bank for International Settlements (BIS)'s report in 2011, the globalization, technology revolution and economic crises recently have urged the banking sector in developing economy to alter the traditional model of their business. Economic crises in 1997 in Asia and 2008 in global scale have revealed the significant weakness in banking sector of those developing countries especially in Asia. Issues such as risky lending practices, weak regulation, heavy subsidy and risky over-lending have been diagnosed as key reason (BIS, 2001). The crisis in 1997 which started from Thailand has emphasized the risk of over-reliance on traditional business activities such as lending and borrowing (Stone, 2000). Globalization and increasing foreign competitors have significantly forced the banking sector in developing countries to reform and seek improvement in order to survive. Deregulation from government has also taken place more frequently as an entry requirement when the market becomes more open to the world. One of the remarkable steps of deregulation is the removal or reduction of the ceiling or limitation of interest rate. Lending and borrowing rate have increasingly followed the market supply and demand. Together with the deregulation, there is more and more presence of foreign banks in local markets which make competition even more extreme. Although those foreign banks' branches and network are quite limited in operation due to heavy regulation from the local government, it still remarkably forces local banks to rethink about competition. In addition to those major drivers for change, technology advances also play a vital role in shaping the landscape of the banking sector. New business services demand increasingly sophisticated information technology applications. For

example, financial instrument such as cash instruments and derivative instruments become more popular in bank transactions to best serve the customer demands which urge the banks to invest more in the financial infrastructures and facilities (BIS, 2011).

Over time, the landscape of banking sector in developing countries has been shaped substantially under the pressures of different internal and external drivers. While deregulation and open market forces local banks to be cautious about income aggressive competition, stricter safety criteria are being enforced to ensure a healthy banking sector. After a long time witnessing a fragmented market, banking sector in developing countries are seeking a lower number of players but with a better financial strength in the market. Banks with poor performance are expected to leave the market in a well prepared plot in order to keep a balanced and stable financial market. Meanwhile, universal banking model becomes more popular. This banking model provides a wide range of financial services besides traditional banking such as insurance, investment banking (Laeven, 2005). While the majority of banks still rely substantially on earnings from traditional banking services, there have been more and more commercial banks in developing countries especially from East-Asia and Latin-America expanding their fee-based and related businesses (Ben Gamra and Dominique, 2011).

1.1.4 Situation in Vietnam

From early 1990s, the banking sectors reformed into a 2-tier system in which the State Bank of Vietnam (SBV) plays in the center. Since then, government have carried out different reforms in order to increase the strength and health of banking sector, especially by privatizing those giant state-owned banks. Nevertheless, the government still control at least 50% of the ownership of those banks and plays as the key stake-holders. Before 1990, SBV operated just like a

commercial bank with additional power to regulate the market. However, after 1990, SBV was reformed to fully operate as a Central Bank while some departments of SBV were transformed into different state-owned commercial banks (Figure 9). These special commercial banks would focus on different industries to help support the development of those industry such as Vietnam Bank for Agriculture and Rural Development (AGR), Bank for Foreign Trade of Vietnam (VCB), Vietnam Industrial and Commercial Bank (CTG), Bank for Investment and Development of Vietnam (BIDV) (Le, 2000).

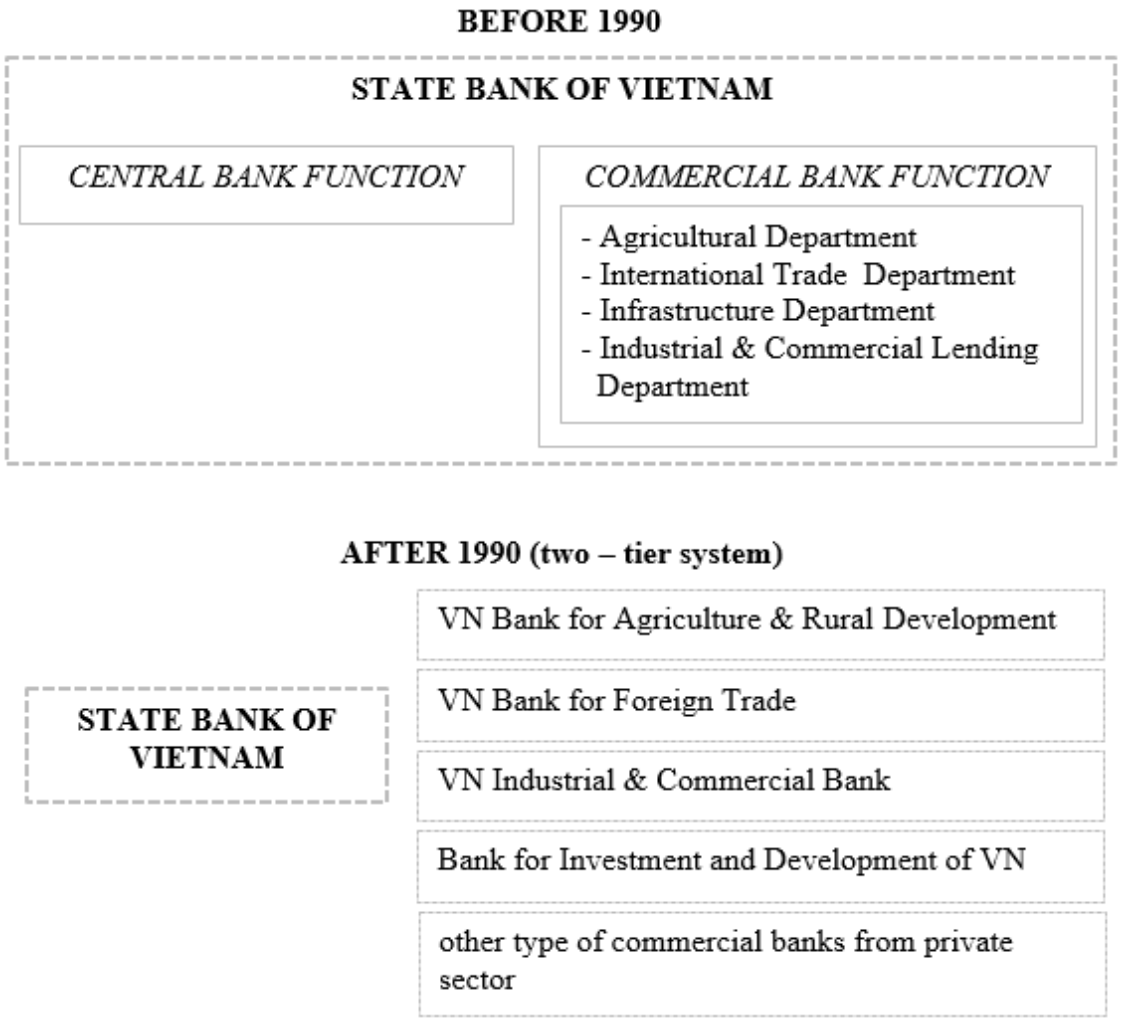


Figure 1: The restructure of SBV before and after 1990

In general, banking sector in Vietnam have most of the characteristics and condition of a banking sector in a developing country. The banking sector is

underdeveloped and receives a significant protection and subsidy from the government. However, recently it has seen great effort of the country to open up its economy to the world such as the Bilateral Trade Agreement between Vietnam and U.S.A in 2001 and Vietnam's successful participation in the World Trade Organization (WTO) in 2007. In 2008, SBV for the first time allowed 100% foreign-owned bank to operate in Vietnam. Before that, only branch offices of foreign banks or joint-venture banks were allowed in Vietnam. Although the banking market is gradually open to foreign players they still face certain barriers from local government. The local banks' range of products and services are quite limited. Poor quality asset Is still a major problem of the banking sector due to excessive and risky lending.

Besides, the market is fragmented as the majority of the players in market are small-sized and medium-sized banks. Meanwhile, the market is highly concentrated with most of the market shares are belong to few giant state-owned bank. Bigger banks and encouraged to take over smaller one for a sustainable development and help local banks can compete not only national wide but also worldwide.

Type	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
State-owned Commercial banks (SOCs)	5	5	5	3	2	1	1	1	1	1
Joint-stock Commercial banks (JSCs)	34	36	37	37	39	38	35	33	33	31
Joint-venture banks	5	5	5	5	4	4	4	4	4	3
100% foreign-owned banks	-	-	5	5	5	5	5	5	5	5
Total	**44**	**46**	**52**	**50**	**50**	**48**	**45**	**43**	**43**	**40**

Table 1: Number of banks in Vietnam
(Source: SBV)

State-owned Commercial Banks are 100% owned by the government while joint-stock Commercial Banks can be partly owned by government. Before 2009, there were 5 state-owned Commercial Banks (SOCs) while there were up

to 37 state-owned Commercial Banks (SOCs) (Table 1). After 2012, there is only one state-owned bank which is the Vietnam Bank for Agriculture and Rural Development. It is the only state-owned Commercial bank left in the market, also the largest bank in term of scale and market share in the banking sector of Vietnam. More than 90% of the total asset of the sector is under control of SOCs and JSCs. As mentioned above, the banking sector in Vietnam is not only fragmented in number but also highly concentrated in market share.

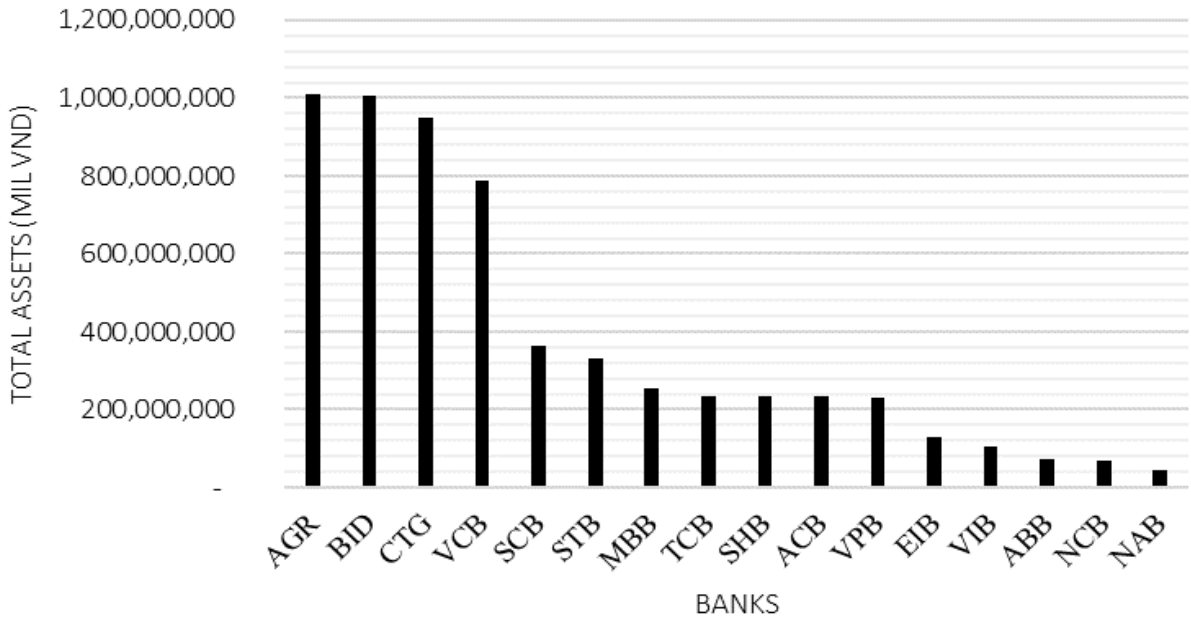


Figure 2: Total assets of top 16 largest banks in Vietnam as of 31/12/2016

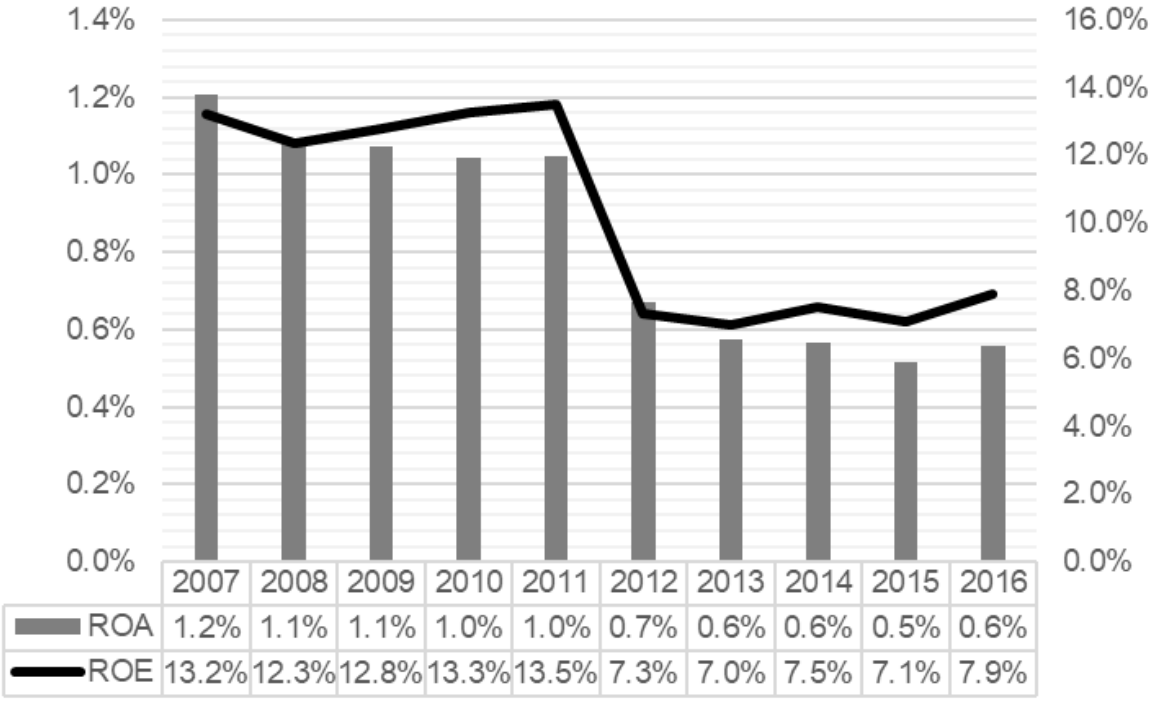
As presented in figure 2, state-owned bank such as AGR and partly state-owned banks such as BID, CTG and VCB have the largest total assets. They occupy a large share of the sector with more than 40% of the total asset of the Vietnamese banking industry. 10% of the number of commercial banks take over more than 40% of total market's asset which is quite highly concentrated. Despite the great concentration, most banks in Vietnam are small and medium sized banks. The high concentration and fragmentation are real challenge for the banking sector in Vietnam. The small banks are usually featured with high level of bad debt and quite vulnerable to different financial risk due to low capital and poor financial

strength. Due to small assets and limited services & products, small banks usually rely on pricing of loans and deposits as their major competitive advantage. As a result, it can affect the overall profitability of the banking sector and increase the risk of non-performing loans. Besides, small banks are not listed on Stock Exchange. Those unlisted banks do not need to disclose their information to public. Hence, transparency is quite a problem. Credit risk and non-performing loans could be hidden. Moreover, small banks do not have adequately the sound ability and profession in dealing with administration and strategy management when the scale of market is getting bigger with more aggressive competition over time.

Similar to other developing countries, the activities of commercial banks have a major and decisive role in the development of the local economy and society. As a developing country who still rely significantly on Agriculture, the economy needs huge support from commercial bank in capital formation and allocation. Commercial banks especially those State-controlled banks have significant role in support Agriculture and also the industrialization and open market process. Annually, their activities as financial intermediaries have contributed directly and indirectly a significant value to the growth of gross domestic product (GDP). The role of commercial banks in Vietnam is even significantly emphasized when considering the small scale of both bond market and stock market. Local companies mainly seek financing through borrowing from banks instead of issue bonds or shares. At the end of 2014, bond outstanding is equal to only 20% of GDP in Vietnam while stock market size was only equal to 32% of total GDP (Ayako Akiyama, 2016). As a result, the stability of the banking system has a crucial role in local economy and society and local authority considers it to be the major objective.

1.2 Recent issues

Despite the fact that this sector has a key role in economy, its operation has faced unsatisfactory results recently. In recent years, the banking sector has experienced significant fluctuation and downtrend in profitability.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ROA	1.2%	1.1%	1.1%	1.0%	1.0%	0.7%	0.6%	0.6%	0.5%	0.6%
ROE	13.2%	12.3%	12.8%	13.3%	13.5%	7.3%	7.0%	7.5%	7.1%	7.9%

Figure 3: Average ROA and ROE of top 16 largest banks in Vietnam

Looking at figure 3 above, the average ROE and ROA of the top 16 largest banks in Vietnam, whose total assets represent more than 80% total asset of the whole market, have been following a downtrend in profitability. More important, the reason behind the low profitability can be varied. One possibility is the poor asset quality. Non-performing loans (NPLs) has become a major problem recently due to over credit expansive in the past decades in Vietnam. Moody's analysed the real NPLs of Vietnam around 15% in 2013 which is much higher than reported 4.7% produced by SBV. Besides, other strategic issues usually seen in an underdeveloped banking sector could possibly account for the low profitability of the banking sector recently. The fact is that competition in banking market is quite intensive and it is full of players including new foreign

banks with financial strength make local commercial banks face more and more aggressive competition over time. Interest margin is no longer a profitable and stable source of income. Sole reliance on traditional business is no longer a good option.

All of these factors highlight the importance of a thorough understanding of what factors are driving the profitability of commercial banks, one of the most important and fundamental indicators of a heathy banking sector. Profitability has been long proved to be an important predictor of banks financial health (Demirgüc-Kunt & Detragiache, 2000). According to Ramlall (2009) profitable banking sector can contribute significantly to the growth of local economy as well as act as a protector of the economy when crises occur. After the financial crisis in 2008, it is compulsory for the banks in the US to maintain a sustainable financial performance in order to keep the country away from downturn Ramlall (2009). As a result, positive profitability is extremely crucial to keep a healthy and stable financial system. Therefore, this research aims to examine the determinants or drivers of the bank system's profitability in Vietnam during the past 10 years from 2007 to 2016. The finding from research will assist the local authority in evaluation of the performance of bank industry.

Although a sound understanding of the determinants of profitability is significant for the economy regulators and the bank's administrator, there is a limited number of major studies regarding this topic in Vietnam at the moment. Dinh (2013) and Batten & Vo (2014) are 2 studies that officially examined straight forward the impacts of different determinants on the bank profitability in the context of Vietnam recently. Therefore, this research is among the first few studies that assess the determinants of bank profitability in Vietnam. The expected contribution to the existing studies is to perform a throughout analysis of different possible influential factors on the profitability in combination with

careful reference to other studies done in other developing countries and also some developing countries as well.

1.3 Research purpose & research question

The purpose of the research is to investigate which factors could possibly have significant effects on the commercial banks' profitability in Vietnam. In other words, it attempts to evaluate the nature of the potential impacts that internal factors as well as external factors might have on the profitability of commercial banks in Vietnam by using multiple linear regression analysis on panel data collected from the top largest banks from Vietnam. Internal factors are factors specific to each individual banks while external factors are macro-economic factors.

In order to achieve the mentioned-above purpose of the research, the following questions will be addressed:

- *What are the potential factors that can drive or determine the profitability of local commercial banks in Vietnam?*
- *In which way do these factors affect the bank profitability?*
- *Are there any significant relationships between those factors and the bank profitability?*

In order to answer these questions, the research will first examine existing research on banking systems in developing countries especially those countries in Asia which have similar conditions to Vietnam. By learning those cases, the studies will try to select potential factors that can drive the profitability in the case of Vietnam. Then, a group of local banks in Vietnam will be selected as representative for the Vietnamese banking sector. A quantitative analysis, more specifically, multiple linear regression, will be performed using selected variable selected from the literature review. The final result will be discussed to answer the research question.

LITERATURE REVIEW & RESEARCH HYPOTHESES

This chapter reviews recently available literature about the determinants of bank profitability and provides a theoretical background on this topic. It includes empirical evidence from major studies conducted in Vietnam and other developing countries which have similar characteristics such as Philippines, Malaysia, Bangladesh, Sri Lanka, and China Besides, some major studies from developed countries such as Greek, Japan, Switzerland and Japan as well as global extent will be also taken into reference. The end of this chapter will include the establishment of several hypotheses which will help to test the models and answers the research questions.

2.1 Existing empirical studies on determinant of banking profitability

2.1.1 Countries classification

In order to understand the nature and definition a developing country, it is important to understand how country and its economy is currently classification. According to World Bank as of 1 July 2016, countries are classified into 3 categories on the basis of Gross National income (GNI) per capita (Table 2).

Country Classification - WORLD BANK as of July 2016	
GNI per Capita (USD)	**Classification**
1,005 USD or less	Low-income economies
From 1,006 USD to 3,955 USD	lower middle-income economies
From 3,956 USD to 12,235 USD	upper middle-income economies
12,236 USD or more	high-income economies

Table 2: Country Classification from World Bank
(Source: World Bank, 2016)

However, it is believed that this classification does not produce a reasonable definition for a developing country. For example, if a country with a handful resource of mineral for export such oil and the oil industry dominate the whole economy, that reason alone should not make that country a developed country. Therefore, as can be seen in many documents of World Bank, it rarely uses “developing countries” or “developing economies” to imply any type of classification.

The development of a country or an economy should not reflect only via the income but also via the sustainability and the prospect of a strong financial system. With a more comprehensive approach, the International Monetary Fund (IMF) initiates the World Economic Outlook (WEO) database including economic statistic of 193 countries. The idea of categorization is based on 3 main criteria which are (1) income per capita, (2) the diversification of export and (3) level of integration into the financial system (IMF, 2016). These criteria motivate a meaningful classification to better reflect the idea of a developing economies. On the basis of these criteria, there are 2 groups which are “Advanced economies” and “Emerging Market and Developing Economies”. “Advanced economies group includes some countries such as U.S.A, Canada, Australia, Germany, France, Finland, Singapore, Korea etc. while Emerging Market and Developing Economies group include mostly countries from Asia, Latin America and Caribbean. Philippines, Malaysia, Bangladesh, Sri Lanka, and China are classified as Emerging and Developing countries in Asia (IMF, 2016).

From this part on, the term developing countries or countries with developing economies are going to be used to imply the classification by IMF.

2.1.2 Developing countries

2.1.2.1 Africa

There has been a significant number of research regarding this topic in developing countries all over the world. One major case of them is Naceur (2003), in Africa, who investigated the Tunisian deposit banks in the course of time from 1980 to 2000. His research put a focus on understanding the impact of internal and external determinants on both profitability and interest margin of the banking system in Tunisia. However, the research only used a limited group of indicators which did not include one important factor which is the credit risk. Interestingly, he also studied the performance of the banking sector in relation with structure of banks market by using market concentration which is calculated by proportion of total assets of top three largest banks in compared with the whole market. This is due to the belief that in a more concentrated market, banks might charge higher rate on their services. The research found that the bank's characteristics or the internal factors such as capitalization, size and the efficiency would decide the major difference in bank profitability while external factors or macro-economic factors such as GDP growth rate and inflation are irrelevant. Meanwhile, operation efficiency and capitalization level clearly strengthen profitability while size has little impact which suggests that economic of scale does not apply to the Tunisian banking market. Different from the study of Athanasoglou et al. (2008), Naceur stated that concentration extent of market does not have significant influence on profitability because competition in market brings more advantage to Tunisian commercial banks rather than concentration. One thing should be noticed is that Naceur introduced the diversification factor in his study with the variable non-interest bearing assets to total assets although the result is insignificant.

There is also multi-country research which is the research of Flamini et al. (2009) in in Sub-Saharan Africa. They conducted the research of bank

profitability then compared the results with other regions. 389 banks sample was selected from 41 Sub-Saharan Africa countries from 1998 to 2006. Findings proved that all selected determinants except for operating efficiency, market share of each bank and growth rate of GDP significant correlate with banks performance. In agreement with Liu & Wilson (2010) there was clear benefit of income diversification on the banks profitability. If banks choose to not heavily rely on interest income, it likely to improve the profitability in general. Interestingly, Flamini et al. (2009) also examine the ownership type of banks by including ownership variables and it proves that ownership type has significant impacts on profitability.

2.1.2.2 Southeast Asia

Moving to a closer developing countries similar to Vietnam, some researchers can be mentioned such as Guru et al. (2002). They investigated the Malaysian banks by collecting 153 observations and set up a range of different internal as well as external factors. Bank size, asset & financing structure, expenses administration, liquidity, and external factors like market share, market growth rate, interest rate as well as regulation are brought in to examine their effects on profitability. In agreement with Athanasoglou et al. (2008), the findings of this research suggested that expenses management plays the most crucial factor in determining the bank profitability. However, different from the findings of Naceur (2003), macro-economic factors such as Inflation are believed to have positive relationship with profitability while market interest rate has a negative relationship with bank performance. The level of deposit had positively influenced profitability. Besides, asset composition inferred that higher of loan level than securities investments would increase the profitability. However, higher loan does not always mean higher profit as the research also concluded that liquidity which was indicated by Loan to deposits had negative impact on profitability.

In Philippines, Sufian & Chong (2008) examined what are driving the local commercial banks' profitability during the period from 1990 to 2005. In compared with Guru et al. (2002), this research is quite interesting when introducing two more variables which are credit risk and income diversification. They found that all the internal factors such as size, credit risk, non-interest expense level have significant negative effect on bank profitability while capitalization, income diversification and economic growth have significant positive effect on profitability. Meanwhile, macro-economic factors such as inflation and stock market capitalization are insignificant. However, the result admits the correlation between economic growth and profitability of the banking sector. To reflect the credit risk, Sufian & Chong employ Loan loss provisions to total loans ratio. The higher the cost used to make provision for the bad loans, the lower the profitability. More interestingly, they also introduced the diversification element in their research. They are one of the pioneers in South East Asian region to examine the impact of diversification which is indicated by Non-Interest income to operating income on profitability of local banking sector. Their result in agreement with Flamini et al. (2009) proves that there is significant benefit of income diversification on the bank profitability.

2.1.2.3 South Asia

A year later, Sufian, in cooperation with Habibullah, conducted a research regarding the same topic in Bangladesh, a South Asian country, to examine the banking profitability of this country during 1997 to 2004 (Sufian & Habibullah, 2009). They use basically almost the same variables as in Philippines. However, they include the assets structure variable in examination as Guru et al. (2002) did in Malaysia. Similarly, the level of loans is proved to significantly correlate with profitability due to the fact that most commercial banks in Asia still highly rely on income from lending and borrowing. Besides, similar to result in Philippines, bank seems to have problem with expanding size. The bigger the

size is, the lower the profitability. Interestingly, opposite with result in Philippines, Loan loss provisions over total loans seems to affect the profitability in a positive direction while capitalization is insignificant. Besides, while Philippines witness the benefit of diversification, Bangladesh case under examination of Sufian & Habibullah (2009) takes diversification as a threat to profitability.

Sufian (2012) continues to develop his study in South Asia in this topic by carrying out a multi-country research including Bangladesh, Sri Lanka and Pakistan. Variables category is upgraded by adding variables reflecting assets structure which is the Deposit to total assets ratio. Besides, he also adds Stock Market Capitalization to GDP in order to reflect the development of Financial system within these countries. Most of his results support in Bangladesh supports his own findings in Bangladesh in 2009. Although the results are not uniform between countries. There is consensus regarding the significant impact of income diversification, operating efficiency on profitability. In agreement with his own study in Philippines in 2008, it proves that the stock market level of development does not significantly affect the profitability in banking sector.

Weersainghe & Perera (2013) conducted a similar research to Sufian (2012) in Sri Lanka from 2001 to 2011. Their research only uses basic indicators such as credit risk, liquidity risk, operating efficiency, GDP and supplements to macro-economic factor Interbank interest rate. Surprisingly, in contrast with Sufian (2012) credit risk indicated by non-performing loans ratio, capitalization ratio and GDP do not produce significant result. This challenges many findings of previous research about the significant relationship of those these factors with profitability. However, it should be noticed that they use different indicators for reflecting the credit risk and capitalization level which can possibly lead to the difference in results. Meanwhile, in agreement with most previous study, the result highlights the importance of ability to control administrative expense, the

advantage of economy of scale and the proportion of liquid asset to ensure the liquidity for the banks. Although more liquid asset seems could prevent liquidity risk for the banks, it can harm the profitability in the end of the day.

2.1.2.4 East Asia

In China, a major East Asian country, García-herrero et al. (2009) appraise the profitability of the local commercial banks during the period from 1997 to 2004. Their research made a similar approach to other previous studies when considering both internal, external determinants of bank profitability and also the industry related factors. However, their approach is huge in the number of variables and also in complexity. In general, there are some major variables namely Non-performing loans ratio to reflect the asset quality, market concentration level to reflect the dominance of state-owned banks in the banking sector, type of banks to reflect the degree of government intervention, list to reflects whether the bank is listed or not, market share on asset. Besides those variable, the research includes other factors which are commonly seen in previous studies. They concluded that banks with higher capitalization, higher deposit level, efficiency and low market share tend to earn higher profitability. Meanwhile, listed banks and banks that do not have mush intervention from government tend to perform better. Due to the characteristic of a communist country, the banking sectors are highly intervened by government with many giant state-owned banks. As a result, the concentration is quite high which make it reasonable to bring in the variable in examination. García-herrero et al. (2009) concluded that a more concentrated banking may result in higher NPLs which can impair the bank profitability. This is proven when looking at the negative performance of top 4 largest state-owned banks in China during the research period. In comparison with private joint-stock commercial banks which achieved higher profitability, this result of the research also indicated the negative influence of government interference on banking.

It can be seen that from different studies in developing countries in South, East and Southeast Asia, internal factors and external factors have different effects on profitability in different countries. However, it should be noticed that there is not much research in those reviewed countries that took into account the effect of income diversification. Only some certain studies were believed to try to explain impact of income diversification when including indicators of diversification and business mix by using ratio of non-interest income to total assets as an indicator. Most of these studies are belong to Sufian & Chong (2008), Sufian & Habibullah (2009), Sufian (2012). That is understandable as in most developing countries, the banking systems are still young and business portfolio is still primitive. Meanwhile, in developed countries, commercial banks have grown to a certain size and have experienced major stages of development. When the business size and range increase, there will appear the benefit of income diversification which is believed to help stimulate the profit and efficiency (Landskroner et al., 2005). Therefore, income diversification is widely studied in developed countries as can be seen in later part. Different approaches have been used in different time frame and different environments. That's why there have been different results. Nevertheless, there is strong agreement on the significant impact of operating efficiency and diversification. Most of the studies have pointed out the existence of the relationship between diversification and profitability.

2.1.3 Developed countries

After taking a look at developing countries in Africa and especially major studies in South, East and Southeast Asia, it is also interesting to look at studies conducted in developed countries. In Greece, Athanasoglou et al. (2008) tried to bring in a comprehensive approach by looking at bank-specific and macro-economic factors. In agreement with studies from China, Philippines, he finds significant correlation between credit risk, capitalization and operating

efficiency with Profitability. However, size and ownership of bank as well as the concentration of banking sector in Greece do not significantly affect the profitability. Instead of using inflation rate, he uses expected inflation rate which is reflected by the rate of 10-year government bond. Not surprisingly, the expected rate affects the profitability significantly due to the fact the bank usually refer the government bond rate to adjust their lending and borrowing rate.

In 2010, Liu & Wilson examined the profitability of Japanese banks for period after the financial crisis between 1997 and 1998. The research picked up banks with different ownership structure and used indicators such as capitalization, operating efficiency, credit risk and especially income diversification to examine their effects on bank profitability. Again, the findings continue to highlight the impact of diversification and the ability to control expense. Other macro-economic factors such as stock market capitalization to GDP shows negative correlation due to the possibility that a developed financial market will motivate companies to borrow money from other channels than commercial banks. Therefore, banks can face significant competition in a highly developed financial market.

In 2011, Dietrich and Wanzenried collected data of 372 banks in Switzerland to study the banking system profitability during the period from 1999 to 2009. Their main purpose is to see the effect of financial crisis in 2008 so they included internal factors as well as macro-economic factors in their study. Capitalization and size effect is insignificant before 2008 crisis but then turn out to negatively affect the profitability after 2008. This finding proves the overall trade-off between capital and profitability. Big banks with rich capital can keep the bank safe from downturn but it will result in low profitability due to low utilization of capital and asset. As expected, loan loss provisions over total loans ratio, although show no significance before crisis, have become increasingly

significant after 2008 crisis and it negatively impair the profitability. Besides basic bank specific factors, they added loans growth rate, operational efficiency, cost of financing. Again, in agreement with Liu & Wilson (2011) they concluded that a more diversified and efficient banks seem to have higher profitability thanks to the fact that fee-based service earns better profit than lending and borrowing activities. Funding cost have negative relationship with bank profitability while Growth rate of loans has positive relationship. The most interesting contribution of Dietrich and Wanzenried (2011) is the inclusion of bank profile in examination. They take into account the effects of Bank Age, Ownership and Nationality. However, ownership turns out to be irrelevant while banks with foreign identity are less profitable.

Antonio Trujillo-Ponce (2012) analyses factors determining the Spanish banks' profitability during the period from 1999 to 2009. The research structurally classified determinants into external and internal factors. The factor groups are quite comprehensive as they include most fundamental and potential factors that used in previous studies. The results suggested that high level of loans, customer deposits, operating efficiency and low non-performing loans were major drivers for the high bank profitability during these years. Size variable does not show any significant relationship with profitability. Meanwhile, most selected macro-economic factors such as GDP, Inflation, market concentration have positive and significant impacts on Spanish banking sector.

After reviewing some major studies in several developed countries, there are not many differences about the impacts of bank-specific factors on profitability while in developing countries, the results are quite mixed and different. Despite the differences in results, there is strong consensus regarding the significant relationship of diversification, operating efficiency and market concentration with profitability in these studies. Asset quality or credit risk and the capital strength are highly appreciated in developed countries.

2.1.4 Vietnam

One thing should be noticed that currently, there are quite few studies in Vietnam which concentrate on studying the determinants of bank system profitability. One outstanding and well-known research can be mentioned is the study of Dinh (2013). His study examined and compared between local banks and foreign banks in Vietnam. The study pointed out that foreign banks outperformed local banks thanks to their ownership and strong capital. Factor such as equity and macro factor such as GDP significantly affect the local banks' profitability in a positive direction. Besides, the study found that loan loss provision had negative effects on bank profitability. Nevertheless, those are only basic internal factors which were employed in his study while other potential determinants such as income diversification and macro-economic factor like the concentration level of the banking sector were not included. These are potential determinants of profitability which were tested in lots of different research in other countries. Besides, some indicators used in his research does not provide the best measurement. Overhead to total asset variable cannot fully reflect the efficiency of the bank operation. A cost to income ratio would be better option.

Another study was Batten & Vo (2014) which employed bank size, credit risk, operation costs, productivity and other bank industry characteristics in their models to test the impact of those determinants on bank profitability. Although the model was quite simple, it already includes some fundamental indicators which might significantly drive the profitability. The study found out that size of bank, credit risk and bank operation cost can negatively affect the return of the bank while capital adequacy, productivity negatively affect the profitability. Meanwhile, macro-economic and industry related elements such as market concentration are employed to reflect the monopoly level within the industry have different results. Concentration intensity can negatively affect profitability

of the bank. In agreement with Dinh (2013), GDP and inflation do not significantly affect profitability.

Both studies, though has some limitations, has contributed and enriched the existing literature regarding determinants of profitability in the world as well as brought a new light to the field of banking management Vietnam.

2.2 Potential determinants of profitability

According to what has been discussed in previous review, there are mixed results about the influence of different factors on profitability. However, it can be seen that usually determinants of bank profitability are divided into two groups which are the internal or banks specific group and the external or macro-economic group. Internal factors are related to the bank management level and are controllable. The internal factors can be different between different banks. Meanwhile external factors are uncontrollable since they are about the market and economy condition which can have the same effect on every banks. Below is summary of the reviewed literature on this topic so far:

Table 3: Summary of reviewed literature
(Source: author)

Authors	Countries and regions	Period	Assets structure	Asset quality (Credit Risk)	Capitalization	Financing structure	Operating effectiveness	Bank size	Income diversification	GDP	Inflation	Market concentration	Extra varibales		
			TL/TA	*NPL/TL*	*EQU/TA*	*DEP/TLI*	*TOE/TOI*	*logTA*	*NOI/TOI*	*GDP*	*INF*	*CONC*			
Naceur (2003)	**Tunisi**	**1980 - 2000**	Loans to total assets	-	Equity to total asset	-	Overhead to total asset	LogTA	non- interest bearing assets to total assets	GDP per capita growth	Inflation rate	bank assets held by the three largest commercial banks in the country	-	-	-
			No	-	Yes (+)	-	Yes (+)	Yes (+)	No	No	No	No	-	-	-
Flamini et al. (2009)	**41 Sub-Saharan Africa countries**	**1998 - 2006**	-	Loans to deposit	EQU/TA	-	Ln(Overheads)	LogTA	Net Interest income to operating income	GDP per capita growth	Inflation rate	-	Market power	Ownership type	-
			-	Yes (+)	Yes (+)	-	No	Yes (+)	Yes (-)	No	Yes (+)	-	No	Yes	-
Guru et al. (2002).	**Malaysia**	**1985 - 1998**	Loans to total assets	-	Equity to total asset	Current account to total deposit	Expense management	LogTA	-	-	Inflation rate	-	Market power	Market interest	Liquidity (loan to deposit)
			Yes (+)	-	Yes (+)	Yes (+)	Yes (+)	Yes (+)	-	-	Yes (+)	-		Yes (+)	Yes (-)
Sufian & Chong (2008)	**Philippines**	**1990 -2005**	-	Loans loss provision to total loans	Equity to total asset	-	Non-interest expenses to total assets	LogTA	Non-Interest income to operating income	Log of GDP	Inflation rate	-	Stock Market Capitalization	-	-
			-	Yes (-)	Yes (+)	-	Yes (-)	Yes (-)	Yes (+)	Yes (+)	No	-	No	-	-
Sufian & Habibullah (2009)	**Bangladesh**	**1997-2004**	Loans to total assets	Loan loss provisions to total loans	Equity to total assets	-	Non-interest expenses to total assets	LogTA	Non-interest income to total assets	Natural Log of GDP	Inflation rate	-			
			Yes (+)	Yes (+)	No	-	No	Yes (-)	Yes (-)	No	No	-			
Sufian (2012)	**South Asia *(Bangladesh, Sri Lanka, & Pakistan)***	**1997-2008**	Loans to total assets	Loan loss provisions to total loans	Equity to total assets	Deposit to total assets	Non-interest expenses to total assets	LogTA	Non-interest income to total assets	Natural Log of GDP	Inflation rate	-	stock market capitalization to GDP	-	-
			Yes (+)	No	Yes (+)	No	Yes (-)	No	Yes (+)	Yes (+)	No	-	No	-	-
Srilanka			Yes (+)	Yes (+)	Yes (+)	No	Yes (-)	Yes (+)	Yes (+)	Yes (+)	Yes (-)	-	No	-	-
Bangladesh			Yes (+)	Yes (+)	No	Yes (+)	Yes (-)	No	Yes (+)	No	Yes (-)	-	No	-	-
Pakistan			No	No	No	Yes (+)	Yes (-)	Yes (+)	Yes (+)	No	Yes (-)	-	No	-	-
Weersainghe & Perera (2013)	**Sri Lanka**	**2001-2011**	-	Non-performing loans ratio	Total Capital base/ Risk Weighted Assets	-	administrative expenses to total assets	Total asset	-	GDP growth rate	-	-	Liquid assets /Total Assets	Interbank interest (Repo Overnight rate)	
			-	No	No	-	Yes (-)	Yes (+)	-	No	-	-	Yes (-)	Yes (-)	
García-herrero et al. (2009)	**China**	**1997-2004**	-	Non-performing loans ratio	Equity to total assets	Deposit to total assets	X-efficiency (Input vs ouput measure)	-	-	GDP growth rate	Inflation rate	Bank assets held by the five largest commercial banks in the country	Market shares	Ownership type (Dummy varibles)	Listed or not
			-	Yes (-)	Yes (+)	Yes (+)	Yes (-)	-	-	No	Yes (+)	Yes (-)	Yes (-)	Yes (-)	Yes (+)

Authors	Countries and regions	Period	Assets structure	Asset quality (Credit Risk)	Capitalization	Financing structure	Operating effectiveness	Bank size	Income diversification	GDP	Inflation	Market concentration	Extra varibales		
			TL/TA	*NPL/TL*	*EQU/TA*	*DEP/TLI*	*TOE/TOI*	*logTA*	*NOI/TOI*	*GDP*	*INF*	*CONC*			
Athanasoglou et al. (2008)	**Greece**	**1985-2001**	-	Loan loss provisions to total loans	Equity to total assets	-	Non-interest expenses to total assets	LogTA	-	Business cycle	Inflation expectations	Herfindahl-Hirschman index	Productivity growth Rate of change in inflation-adjusted		Ownership
			-	Yes (-)	Yes (+)	-	Yes (-)	No	-	Yes (+)	Yes (+)	No	Yes (+)		No
Liu and Wilson (2010)	**Japan**	**2000-2007**	Loans to total assets	Non-performing loans ratio	Equity to total assets	-	cost-to-income ratio (total operating cost divided by total income)	-	diversification (non-interest income divided by total operating income)	GDP growth	-	Herfindahl-Hirschman index	market share of each bank	stock market capitalization to GDP	-
			No	Yes (-)	Yes (+)	-	Yes (-)	-	Yes (+)	Yes (-)	-	Mixed result	Mixed	Yes (-)	-
Dietrich and Wanzenried (2011)	**Switzerland**	**1999-2009**	-	Loan loss provisions to total loans	Equity to total assets	-	Cost-to-income ratio	Total assets	Non-interest income to total operating income	real GDP growth	-	Herfindahl-Hirschman index/ Effective tax rate	Funding cost of deposits	Difference between bank and market growth of total loans	Bank Age / Ownership/ Nationality
			-	Yes (-) after 2008 crisis	Yes (-) after 2008 crisis	-	Yes (-)	Yes (-) after 2008 crisis	Yes (+)	yes (+)	-	No after 2008 crisis	Yes (-)	Yes (-)	Mixed results
Antonio Trujillo-Ponce (2012)	**Spain**	**1999-2009**	Loans to total assets	Non-performing loans ratio & Loan loss provisions ratio	Equity to total assets	Deposit to total liabilities & annual customer deposit growth rate	Cost-to-income ratio	LogTA	Herfindahl–Hirschman index	real GDP growth	Inflation rate	Herfindahl–Hirschman index	Interest rate on the MRO of the ECB	-	-
			Yes (+)	Yes (-)	Yes (+)	Yes (+)	Yes (-)	No	No	yes (+)	yes (+)	yes (+)	yes (-)	-	-
Dinh (2013)	**Comparision between Vietnamese banks and foreign banks**	**2000-2012**	Loans to total assets	Loan loss provisions to total assets	Equity to total assets	Deposit to total assets	Overhead to total asset	Total assets	-	GDP growth rate	Inflation rate	-	depth of the financial sector	-	-
			Yes(+)	Yes(-)	Yes(+)	No	Yes (+)	No	-	Yes(+)	Yes(+)	-	No	-	-
Vietnam Banks			Yes(+)	Yes(-)	Yes(+)	No	Yes (+)	No	-	No	No	-	No	-	-
Foreign banks			No	No	No	No	Yes (+)	No	-	No	No	-	No	-	-
Batten & Vo (2014)	**Vietnam**	**2006-2014**	-	Loan loss provisions to total assets-	Total Capital base/ Risk Weighted Assets	-	operation expense to total assets	LogTA	-	GDP growth	Inflation	Herfindahl–Hirschman index	Productivity (log of the profit per employee)	-	-
			-	Yes (-)	Yes (-) on ROE and Yes(+) on ROA	-	Yes (-) on ROA and Yes(+) on ROE	Yes(-)	-	No	No (Affect Net interest margin only)	Yes(-)	Yes(+)	-	-

2.3 Literature Gap

This chapter provides a general view of previous addressed studies. These research ranges from developing Asian countries such as Philippines, Sri Lanka, Bangladesh, Malaysia, Chin, Pakistan or developed countries such as Switzerland, Spain, Greece, Japan. Also some regional studies for South Asian or African countries are also taken into consideration.

In Vietnam specifically, there are few research considering the determinants of profitability. However, two major studies could be mentioned are Dinh (2013) and Batten & Vo (2014). They are among few researchers who have quite straight forward ideas about determinant of profitability. Hung (2007), Vu & Turnell (2010) or Vu & Nahm (2013) concentrate more about the efficiency level of local commercial banks rather than profitability.

However, study of Dinh (2013) could not provide a comprehensive approach. In fact, he more focus on the comparison between domestic and foreign banks operating in Vietnam. Besides, the selection of variables is quite limited. Also, it was done 4 years ago. As a result, his study seems to be insufficient compared with other studies abroad and is outdated as well. Review of existing research from other countries has added more valuable direction to the study in Vietnam. Determinants are categorized into specific and macro-economic factors. Besides basic factors such as size, capital, loans loss provision, deposit, GDP, inflation those existing research also study more potential explanatory variables such as the management ability, the concentration level of banking sector and most importantly, the diversification of income. Although there is not consensus regarding their effects in different countries, there is evidence that those factors have certain connection with profitability.

It should be also noticed that in 2014, Batten & Vo had attempted to bring a more comprehensive than Dinh (2013) approach by adding more factors such as

Operation Cost, Productivity to better reflect the management efficiency of the banks. Especially they also mention the importance of the market concentration level in their research as the Vietnam banking system intensity is quite high. There is always the appearance of 5 largest banks which occupy more than 65% total asset of the market. However, they still failed to reflect one of the most important trends in the global banking market which is the diversification of income and business. This element may have a potential role in not only mitigating the concentration risk but also in determining the profitability of different banking markets in the world. In the past, most of what banks earned came from interest. However, the world has been witnessing increasing dependence on noninterest income of the banks. Stiroh (2004) pointed out that in U.S.A, the percentage of Interest income to total operating income has fallen sharply from 75% in 1984 to 57% in 2001. Noninterest income sources is a mean for banks to compensate for the reduced income from interest and also a crucial way to mitigate the risk better. Although there were mixed results regarding the effects of income diversification from empirical studies, it is undeniable that income diversification with more non-interest income source has become a popular trend for modern banks.

Besides, these other studies applied loan loss provision ratio as measure of credit risk but this ratio has some drawbacks. This is due to the fact that loan loss provision is a common requirement for all banks but management ability of each bank can be distinctive so it may not reflect the actual credit risk of banks. Also, loan loss provision can be more possibly subject to manager's manipulation to smooth reported income (Kanagaretnam et al., 2015). This paper modifies credit risk representation to NPLs ratio instead of loan loss provision because of its suitability. Firstly, NPLs ratio is undoubtedly the most commonly measure of credit risk of loan portfolio of financial institutions (Pinto & Vivan, 2013) and also used as basic credit risk for banking sector like the studies of Safakli

(2007), Aggarwal and Jacques (2001), Ahmad and Ahmad (2004). Moreover, according to De Waal et al. (2009), NPLs is a mirror of bank performance as the situation of NPLs deteriorates in conjunction with low performance of banks in recent years. Hence, this thesis replicates NPLs ratio as credit risk measure of banks.

After reviewing carefully those 2 existing research in Vietnam, from the perspective of the author, it would be proper to include those important factors such as Income diversification, Non-performing loans, management efficiency, market concentration together with other common factors into this thesis to investigate more about their potential effects in the situation of Vietnamese banking sector and to fill the gaps of existing literature. Additionally, the periods of studies from literature review are outdated and can be invalid to describe the highly dynamic banking environment at the present.

Besides, the research also extends the time frame of evaluation until 2016 to better reflect any changes during this recent period in Vietnam such as Vietnam's accession to WTO in 2007 and financial crisis in 2008 which hit the local economy significantly.

2.4 Hypothesis development

After a review of existing studies regarding bank profitability determinants, most authors use two major groups of determinants. The first group includes internal factors which are specific to each banks. Commonly, these are controllable factors that can be directed by the bank itself. The other group is composed of uncontrollable factors or external factors which are related to industry, macro-economy.

Besides traditional factors such as size, assets structures, assets quality, capitalization, efficiency, revenue or income diversification is also introduced

recently to internal factors group to fully reflect the determinants of bank profitability.

Internal factors as Independent variables are indicated by:

1) Assets structure (loans level)

TL/TA = Loans to customers to total assets ratio

To evaluate the impact of assets structure on profitability, the researcher uses the total loans Loans (to customers) to total assets ratio. As a main source of income for commercial banks, it is suggested by many existing studies that the higher the loan proportion in the asset portfolio of the bank, the higher the profitability is. Naceur (2003) stated that the commercial most of bank's profit comes solely from interest-bearing assets which are loans and advanced. Guru et al. (2002) share the same idea when doing their research in Malaysian banks stating that other assets such as stocks are of highly risky which make the banks primarily keep loans and advances in their asset portfolio. Banks gain profit on the basis of difference between deposits rate and loans rate which is called Net interest margin. Therefore, when loan increase, the profitability is expected to follow the same direction.

2) Asset quality (credit risk)

NPL/TL = No n-performing loans to total loans ratio

Dinh (2013) as well as Athanasoglou et al. (2008), Sufian & Chong (2008), Sufian & Habibullah (2009), sufian (2012), Weersainghe & Perera (2013) use loan loss provision as an indicator for credit risk. However, it was mentioned above that Loan loss provision may be manipulated by management level to produce a smooth reported income (Kanagaretnam et al., 2003). Besides loan loss provision is more about requirement of SBV rather than a reflection of banks specific credit risk. Therefore, the research proposes asset quality as a measure of credit risk. It is indicated by the ratio of bad loans, usually referred as NPLs to total loans. NPLs are considered as sub-standard or overdue loans

and deemed as loss for bank when the debtors are unable to pay back. According to standards of SBV, NPLs are overdue loans for more than 90 days which includes loans from group 3, 4 and 5 as reported in financial statement.

As the NPLs increases, the commercial banks especially in the case of Vietnam are required to make loan loss provision which will result in costs for the banks and, in turn, will negatively affect the profit. Athanasoglou et al. (2008) as well as Liu & Wilson (2010) proved that credit risk could negatively affect the profitability of banks but in contrast, Weersainghe & Perera (2013) claim that NPLs is not significant. However, this research believes that even if banks dare to take risk and giving enormous loans to customers with bad credit history to earn income, the risk of default loans is so high that it can cause huge loss for the bank in the end. Due to the serious damage that NPLs can cause, this research expects that banks may experience low income when credit risk increases.

After above analysis, this research will exam level of impact that assets quality and assets structures have on Vietnamese bank profitability with 2 hypotheses as below:

Hypothesis 1: There is significant positive relationship between credit risk (TL/TA) and bank profitability (H1)

Hypothesis 2: There is significant negative relationship between credit risk (NPL/TL) and bank profitability (H2)

3) Capitalization (equity level)

TE/TA = Total equity to total assets ratio

Capitalization is measured by the total equity to total assets ratio. Banks equity contains majorly capital and reserves which are the indicators of bank's ability to absorb financial loss and risk. In Vietnam, the SBV demands a certain level of capital to ensure a healthy banking system. The higher the capital is, the better

chance that banks can go through financial crisis. With higher capital, banks do not need to borrow more from external parties with high cost which can negatively affect the bank profitability. There are strong consensus regarding the role of capitalization in many studies over the world such as Guru et al. (2002) in Malaysia, Sufian & Habibullah (2009) in China, Liu & Wilson (2010) in Japan, Pasiouras & Kosmidou (2007) in Europe and Flamini et al. (2009) in Sub-Saharan Africa. They all report the significant support of capitalization that capitalization has on banks. As a result, researcher will employ capitalization as an independent variable with expectation of a positive effect.

Hypothesis 3: There is significant positive relationship between capitalization (EQU/TA) and bank profitability (H3)

4) Financing structure (deposits level)

DEP/TLI= Total customer deposits to total liabilities ratio

Deposit refers to the money that customers keep in the bank with different terms in order to gain interest rate or use payment services of the banks. Although a major number of existing literature do not employ deposits in evaluating determinants of profitability, there is sound ground to believe in a potential effect of deposit level on profitability in the case of Vietnam. In a highly traditional way, the banks make profit by using the deposit from customers and lend it to borrowers. The profit is the difference between deposit interest rate and loans interest rate which is called Net Interest margin. It can be clearly seen that the banks solely rely on deposits to finance their lending business. In Vietnam, this finding is quite true as local banks still heavily rely on customer deposit to finance their activities. According to Claeys & Vander Vennet (2008); Garcia-Herrero et al. (2009), in comparison to other financing sources such as bonds issuance or borrowing from customers, deposit is less costly. Therefore, bank have higher level of deposit might have more resource to invest in many other income earning activities to produce better profitability for the bank. Also,

Sufian (2012) in the research of South Asian countries, also claims that bigger banks with relative higher deposit level compared with smaller banks could earn more return. However, competition between commercial banks to attract deposits from customer may lower down the net interest margin and as a result, make the bank profitability decrease. Therefore, this research will examine if there is significant negative or positive relationship between the percentage of customer deposit and the bank profitability.

Hypothesis 4: There is positive/negative relationship between deposits percentage (DEP/TLI) & bank profitability (H4)

5) Operating efficiency

TOE/TOI = Total operating expense to total operating income ratio

Operating efficiency demonstrates the operating expenses or non-interest expenses as percentage of total income. This variable reflects the management ability of banks to generate income given a certain amount of input cost such as employee salaries, advertising cost, administration costs etc. If this ratio decreases, it may also improve the bank profitability. Many previous studies in both developing and developed countries conclude that operation efficiency significantly affects profitability in a positive direction such as Guru et al. (2002), Garcıa-Herrero et al. (2009) Liu & Wilson (2010), Weersainghe & Perera (2013), and Pasiouras & Kosmidou (2007). Dinh (2013) and Batten & Vo (2014) also followed the same direction by proving that Vietnamese bank profitability has positive connection with Operating efficiency. However, in an increasingly competitive market as in Vietnam, it is not certain about whether or not the banks are going to be the last beneficiary or it will pass this benefit to its customers by decrease borrowing rate and increase deposit rate. Therefore, we should examine this factor as an important variable for further explanation.

Hypothesis 5: There is positive relationship between operating efficiency (TOE/TOI) and bank profitability (H5)

6) Bank size

LogTA = logarithm of total assets

Many researchers agree that a nonlinear relationship between the bank size and bank profitability exists which means at first profitability will increase alongside with bank size but it will decrease beyond a certain point (Athanasoglou et al., 2008). Logarithm of total assets can be employed to reflect this nonlinear relationship (Athanasoglou et al., 2008). Besides, Elsas et al. (2010) conclude that many banks earn the benefit of the economy of scale to increase profitability. However, Dietrich & Wanzenried (2011) suggested that some commercial banks are so extremely huge that they become too complicated for administration. Therefore, the economy of scale disappears as a consequence of agency costs, bureaucratic expenses, and other management expenses. There are also mixed results considering the impact of size on profitability in South and Southeast Asian regions. Sufian & Chong (2008) found size and profitability do not correlate with each other in Philippines' bank while study of Weersainghe & Perera (2013) in Sri Lanka suggests an opposite idea. As a matter of fact, there are different opinions about the relationship between size and profitability so this research will not yet determine the effect of this factors

Hypothesis 6: There is positive/negative relationship between bank size (LogTA) and bank profitability (H6)

7) Income diversification (Non-interest income level)

NII/TOI = Net interest income to total operating income

Traditionally, banks earn a majority of their income from the borrowing and lending activity with interest income as the main source. However, income from other source or non-interest income have gained more and more attention. As the time goes by, modern banks find it crucially to diversify their activity to reduce the risk of too much dependence on interest business. Moreover, according to some studies in developed countries where banking sectors are

quite advanced such as Dietrich & Wanzenried (2011) and Liu & Wilson (2010) in Japan, the return earned from activities other than lending and borrowing is usually more profitable. Non-interest income includes different types of activities such as securities investment, insurance, payments services (Sufian & Chong, 2008). In Vietnam, recently, local banks have been increasingly aware of the new approach with highly innovative technology. Vietnamese interest rate market is quite fluctuant and highly competitive. Therefore, business diversification is increasingly popular to help banks generate more stable and sustainable income. Due to its novelty in Vietnam, there are not any official studies that study income diversification's direct effect on bank profitability except for some studies such as "Income diversification in banking industry and its effect on bank risk" by (Le, 2016), "Risk & Diversification of income in the Vietnam Banking System" (Nguyen & Vo, 2015). Therefore, this research proposed income diversification as an important variable and examine its effect on profitability. Following the study of Sufian & Chong (2008) non-interest income to total assets ratio (NII) will be used as an indicator.

However, it can be seen from previous studies that the impact of Income diversification is still unclear. Liu & Wilson (2010) in Japan and Dietrich and Wanzenried (2011) in Switzerland and Sufian (2012) in South Asia claims that income diversification helps improve the bank profitability as non-interest businesses can produce higher return. In contrast, some previous studies suggested different ideas such as Sufian & Habibullah (2009) in Bangladesh, Naceur (2003) in Tunisi, Stiroh & Rumble (2006), Lepetit et al. (2008), They prove that a higher level of diversification does not always lead to an improvement of the bank's profitability.

As can be seen, the idea about role of diversification of income is not conclusive. Hence, this research proposes an undetermined effect of Income diversification in the hypothesis

*Hypothesis 7: There is a positive/negative relationship between the Income diversification of a bank (*NII/TOI*) and the bank's profitability (H7)*

External factors as Independent variables are indicated by:

8) Annual growth of GDP

There are mixed results regarding the effect of economic growth which is measured by GDP growth on profitability. Nevertheless, it is believed that the loan portfolio as a majority of bank assets can be negatively affected by the bad economic conditions. A low asset quality can force the bank the make banks increase the provision that reduces the bank reported income. On the other hand, when the economy experiences positive growth, banks can benefit from the improvement of customers' business and credit solvency (Athanasoglou et al., 2008). This research chooses annual growth of GDP as indicator to test the hypothesis

Hypothesis 8: There is a positive relationship between GDP growth and bank profitability (H8)

9) Annual growth of consumer price index (CPI) or inflation rate (INF)

Recent studies such as Flamini et al.(2009), Guru et al. (2002), Sufian & Chong (2008), Sufian & Habibullah (2009), Alexiou & Sofoklis (2009) all suggested that inflation rate has a positive relationship to banks' returns. According to Antonio Trujillo-Ponce (2012), when the inflation rate is high which lead to higher risk, the bank's management level anticipates inflation expectations and adjust interest rates of lending and borrowing to achieve higher profits. Dinh (2013) in the context of Vietnam also support the positive effect of inflation. However, his data was collected before 2013 and was out of date. Therefore, this research still proposes inflation rate as a variable to test the hypothesis

Hypothesis 9: There is a positive association between inflation (INF) and bank profitability (H9)

10) Market concentration

CONC = the total assets of top 5 largest banks to the whole market

Market concentration is the proportion of total assets of top 5 largest banks in Vietnam compared with assets of the whole market. A higher ratio implies the concentrated market power of a small group of banks. According to Abbasoglu et al. (2007), the concentration level of the market can indicate the level of competition within it and it can affect the performance of firms within a highly concentrated market.

The existing evidence about the effect of market concentration are not conclusive. Athanasoglou et al. (2008) in Greece found significant negative relationship between the performance of the banks and level of concentration. In Chinese banking system where there is the existence of many giant state-owned banks, García-Herrero et al. (2009) concluded that a more concentrated banking sector may decrease bank profitability. Meanwhile, Naceur (2013) in Tunisia found this factor neutral and irrelevant. Antonio Trujillo-Ponce (2012) in Spain and Claeys & Vander Vennet (2008) in Eastern Europe both find out evidence about the positive relationship between concentration and profitability.

Antonio Trujillo-Ponce (2012) mentioned the theory of market-power hypothesis or also known as structure-conduct-performance hypothesis which claims that in a more concentrated banking market, the banks can benefit from the market power which allows the banks to price their products and service unfavorable for the customer.

Due to the fact that Vietnam's banking market is heavily concentrated with more than 70% of total market assets belong to only 5 banks, the competition is quite low and bank might possibly benefit from the monopoly power. As a result, the relationship of market concentration with profitability is expected to be positive.

Hypothesis 10: There is a positive association between market concentration (CONC) and bank profitability (H10)

In summary, variables and expected signs used to build regression model are presented in table 4 below:

Variables			**Symbol**	**Hypothesis**	**Expected effect**
Dependent variables		Return on Asset	ROA		
		Return on equity	ROE		
Dependent variables	Internal	Assets structure	TL/TA	H1	+
		Asset quality (Credit Risk)	NPL/TL	H2	-
		Capitalization	EQU/TA	H3	+
		Financing structure	DEP/TLI	H4	+/-
		Operating efficiency	TOE/TOI	H5	+
		Bank size	logTA	H6	+/-
		Income diversification	NOI/TOI	H7	+/-
	External	GDP	GDP	H8	+
		Inflation	INF	H9	+
		Market concentration	CONC	H10	-

Table 4: Summary of proposed hypotheses
(Source: author)

RESEARCH METHODOLOGY

This chapter aims to give a thorough explanation for the method selection and the use of research theories to achieve the proposed objectives of the research

3.1 Research philosophy, approach and strategy

3.1.1 Research philosophy

Research philosophy is considered as one the most crucial element during the knowledge development process in a certain field. Saunders et. al. (2009) concluded that: “The research philosophy you adopt contains important assumption about the way in which you view the world”. Those assumptions will place a great impact on the way we form the strategy and methods for the research.

Interpretivism and positivism are the 2 most popular philosophies which have been widely used by academic researchers. While interpretivists give prominence to humanistic qualitative methods, positivist choose scientific quantitative methods for their studies.

The researcher with a positivist view believes that the reality does not depend on the observer and deemed to be objective. Therefore, that reality is measurable and predictable (Orlikowski and Baroudi (1991); Remenyi et al. (1998)). Positivist studies are deemed to be not subject to the variable behaviour of human beings and therefore, results from these studies are believed to be more creditable. Consequently, this type of research is mostly linked to science and significantly less connected to arts-based research which usually involves the participation and observation of humans. The adoption of positivist view will have the researcher work more with facts and figures which make their studies to be considered quantitative studies.

This research “Determinants of Vietnamese banking system profitability: case of Vietnam” mainly employed data exported from the audited reports of the chosen commercial banks to test the hypotheses developed in previous chapter. Analysis and conclusion are solely based on facts and figures which introduces few subjectivities in the research. Therefore, a positivism view should be employed.

3.1.2 Research approach

The approach chosen for a research reflects the range of logics behind its construction and are usually determined by the selected philosophy. There are commonly 2 types of approaches which are inductive approach and deductive approach. While inductive approach is backed by interpretivism philosophy, deductive approach is based on positivism philosophy. Deductive approach usually applies “top down” analysis which implies the process of going from general ideas or theories to a specific confirmation. This process is based mostly on facts & figures which involve few subjectivities. In contrast, inductive approach usually applies “bottom up” process which goes from specific observations to general theories. Therefore, it involved quite significant amount of uncertainty (Saunders et. al. 2009).

The research “Determinants of Vietnamese Banking System Profitability”, as the name implied, was carried out using regression model to test some hypotheses and confirm some relationship of studied factors with the profitability. Therefore, the deductive approach will be the key approach in this research.

3.1.3 Research strategy

After identifying the philosophical stance and suitable approach, a researcher has to think of plan of how to answer the research question. This plan is

assumed to be the research strategy. There are different types of research strategy in which four types are quite popular namely experiments, surveys, case Studies, archival research (Saunders et al. 2009).

As stated above, this research is looking to evaluate the determinants of bank profitability using regression analysis and hypotheses testing. Accordingly, experimental research strategy should best fit with this idea as experimental research aims to examine relationship between variables using the collected data available.

3.2 Data collection & sampling criteria

The research uses primary data collected from annual reports of 16 selected sample banks in Vietnam during the period from 2007 to 2016. These are already audited which could highly ensure the creditability of data source. Numbers and figures extracted from the annual report are usually deemed for administrative purpose because they reflected the past activities and performance. Therefore, they are considered as secondary data source (Saunders et al., 2009)

As mentioned above, there are 16 commercial banks selected as samples for the research. The selected process based on different criteria and considerations. The first criteria is the availability and sufficiency of the data during period 2007 to 20016. Only banks with audited and published annual report would be selected. Secondly, the research will not take into consideration of those banks with M&A history during the targeted period. The last and also the most important criteria is the sample representativeness. The number of banks would be selected so that their total assets at the end of 2016 making up to more than 83% of the whole banks market assets (See Appendix 1). According to those criteria mentioned, there are 16 banks are selected (See Appendix 1).

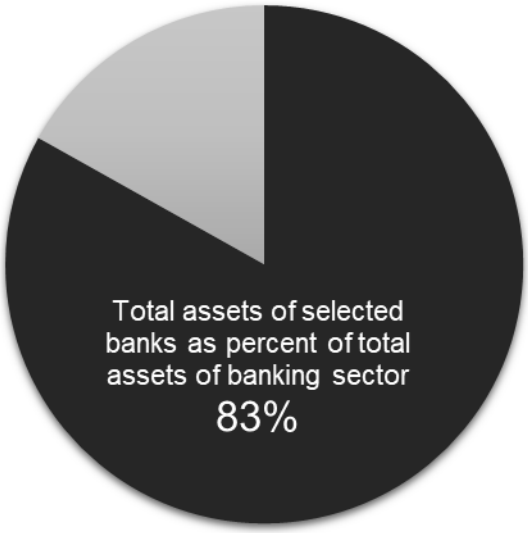


Figure 4: Assets of selected banks as percent of assets of banking sector

According to figures published by SBV, at the end of 2016, the total assets of both state-owned banks and join stock commercial banks are around 7,284,771,135 billion VND. As a result, the total assets of those selected banks occupy for around 83% total asset of the market (Figure 4). So these sample banks can be considered as significantly representative of the bank system in Vietnam.

3.3. Research design

3.3.1 Analytical Framework for data analysis

After review different existing literature, results from empirical experiments suggested different factors as the determinants of bank profitability. Those determinants were categorized into internal (bank-characteristics) and external determinants (industry-related, macro-economic indicators). Using the regression analysis, this research will investigate the relationship between those determinants with the profitability of the selected banks during the period from 2007 to 2016. The conceptual framework is illustrated in Figure 5 below:

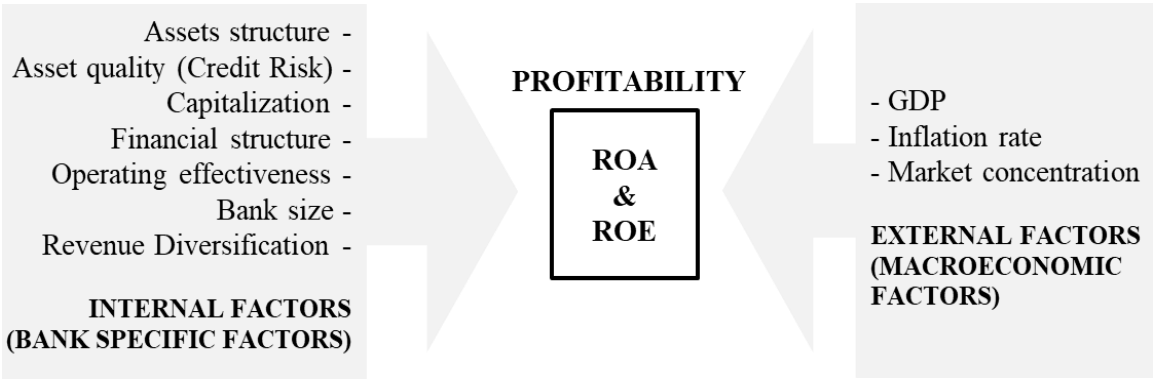


Figure 5: Analytical framework
(Source: author)

3.3.2 Profitability indicators as dependent variables

According to previous studies, return on assets (ROA), return on equity (ROE) and net interest margin (NIM) are usually employed to reflect the profitability of commercial bank (García-Herrero et al., 2009) (Athanasoglou et al., 2008).

According to García-Herrero et al. (2009), net interest margin should be a good indicator of banks profitability if the deposit and borrowing interest rate can reflect closely the bank's autonomy not the imposed rules from the government. However, in Vietnamese market, due to the heavy intervention into the market of SBV, local banks always have to follow a certain level of interest rate ceiling which does not make up a good market economy. Therefore, researchers believe net interest margin is not a good indicator of for profitability in this research.

Therefore, ROA and ROE are considered to better fit with the context of Vietnam. ROA is calculated by dividing Net income by total assets while ROE is calculated by diving Net income by total equity. They have been widely used in previous studies (Athanasoglou et al., 2008; Dietrich & Wanzenried, 2011; Gul et al., 2011; Sufian & Habibullah, 2009; Tan & Floros, 2012). Moreover, ROA and ROE are more comprehensive indicators as it reflects different sources of earning not only profit from lending and borrowing activities. This is quite

important in the context of new business landscape where income diversification becomes more and more vital.

3.3.3 Internal & external factors as independent variables

Internal and external determinants of bank profitability are set as independent variable for regression model. According to previous research, there are various Internal & external factors employed as independent variables. However, only a selective range of variables will be employed for this research based on their suitability in the context of Vietnam.

The variables as well as their measurement are presented below:

- Assets structure variable is measured by total loans (to customers) to total assets ratio (TL/TA)
- Asset quality or credit risk is measured by amount of NPLs to total loans ratio (NPL/TL)
- Capitalization is measured by total equity to total assets ratio (EQU/TA)
- Financial structure is measured by total customer deposits to total liabilities ratio (DEP/TLI)
- Operating efficiency is measure by total operating expense to total operating income ratio (TOE/TOI)
- Bank size is measured by logarithm of total assets (logTA)
- Income diversification is measured by Net-interest income to total income (NII/TOI)
- GDP is measured by Annual growth of GDP (GDP)
- Inflation is the Annual inflation rate or the annual growth of CPI (INF)

- Market concentration is the total assets of top 5 largest banks to the whole market (CONC)

3.4. Regression Model

The researcher chooses panel data regression estimators approach for this study in order to analyse the cross-sectional data and time series data. The panel data also called longitudinal data of this research will be collected over a time period and also over the same banks which makes up a tow-dimensions data set for regression purpose. In particularly, the panel data set employed in this research will include 160 observations from 16 selected banks during the period from 2007 to 2016. Panel data analysis approach is deemed to best fit the research's purpose as it will provide more information and less biased results than traditional cross-section and time series analyses alone. According to Baltagi (2008, p.7): "Panel data give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency". It also treats individuals, firms, states or countries as heterogeneous or different entities which help bring a better reliable result.

To analyse the panel data, the multiple linear regression technique will be employed to examine the effects of internal and external determinants as explanatory variables on banks profitability as dependent variables.

The expected regression models are described as below:

$$ROA_{it} = \beta_0 + \beta_1(TL/TA)_{it} + \beta_2(NPL/TL)_{it} + \beta_3(EQU/TA)_{it} + \beta_4(DEP/TLI)_{it} + \beta_5(TOE/TI)_{it} + \beta_6(LogTA)_{it} + \beta_7(NII/TI)_{it} + \beta_8(GDP)_{it} + \beta_9(INF)_{it} + \beta_{10}(CONC)_{it} + \varepsilon_{it}$$

$$ROE_{it} = \beta_0 + \beta_1(TL/TA)_{it} + \beta_2(NPL/TL)_{it} + \beta_3(EQU/TA)_{it} + \beta_4(DEP/TLI)_{it} + \beta_5(TOE/TI)_{it} + \beta_6(LogTA)_{it} + \beta_7(NII/TI)_{it} + \beta_8(GDP)_{it} + \beta_9(INF)_{it} + \beta_{10}(CONC)_{it} + \varepsilon_{it}$$

Where:

- ROA is return on assets or after-tax income to total assets
- ROE is return on equit or after-tax income to total equity
- TL/TA is total loans (to customers) to total assets ratio
- NPL/TL is NPLs (bad loans) to total loans (to customer) ratio
- EQU/TA is total equity to total assets ratio
- DEP/TLI is customer ceposits to total liabilities ratio
- TOE/TOI is Total operating expense to total operating income ratio
- LogTA: Logarit of total assets
- NOI/TOI is Net-interest income to total operating income ratio
- GDP is annual growth of GDP
- INF is annual inflation rate (annual growth of CPI)
- CONC is the total assets of top 5 largest banks to the whole market

3.5 Estimation method

In order to properly employ the multiple linear regression for analysis of longitudinal data or panel data, careful diagnostic of regression model should be well taken care of. As the research use panel data, there are two fundamental models of panel data which are fixed effects model (FEM) or random effects model (REM) (Schmidheiny, 2016).

Before going deep to deciding between REM and FEM, a range of diagnostic tests will be performed to ensure the appropriation and validity of the model. Some major tests need to be performed especially in the case of Panel data include multi-collinearity, autocorrelation (also known as serial correlation) and heteroscedasticity.

In statistics, the multi-collinearity also known as collinearity is a phenomenon in multiple-regression model in which one explanatory variable is highly correlated with other explanatory variables. According to O'brien (2007, p.673): "Collinearity can increase estimates of parameter variance; yield models in which no variable is statistically significant even though R^2_y is large". This is a huge threat to the linear regression model because it can impair statistical significance of an explanatory variable. The outcome regression model can be significant but there might be all insignificant coefficients due to the existence of multi-collinearity. In order to test for this multi-collinearity, this research use Variance Inflation Factor (VIF) test using commands in Stata software. Variance inflation factor (VIF) help quantify the level of multi-collinearity within an ordinary least squares regression. It indicates how much the variance of an estimated regression coefficient is escalated due to the (Akinwande et al. 2015). In case VIF is equal to 1, multi-collinearity does not exist among independent variables. A VIF between 1 and 5 signifies that independent variables could be correlated with each other at an acceptable level. However, if VIF is more than 5, multi-collinearity become a serious problem for the model (Akinwande et al. 2015). According to the result from Stata presented in table 5 below, all variables are between 1.26 and 3.07 which is below 5. Therefore, the problem of multi-collinearity can be ignored in this research.

Variable	**VIF**	**1/VIF**
TL/TA	3.070	0.325
NPL/TL	2.000	0.501
TE/TA	1.900	0.527
DEP/TLI	1.890	0.528
TOE/TOI	1.890	0.530
LOGTA	1.840	0.544
NOI/TOI	1.720	0.581

GDP	1.350	0.741
INFL	1.300	0.767
CONC	1.260	0.796
Mean VIF	1.82	

Table 5: Variance Inflation Factor Test
(Source: computed by author using Stata command)

Another way to examine the existence of multi-collinearity is the use of correlation matrix, as presented in table 6 to see how much each variable is correlated with each other.

	ROA	**ROE**	**TL/TA**	**NPL/TL**	**TE/TA**	**DEP/TLI**	**TOE/TOI**
ROA	1.00						
ROE	0.80	1.00					
TL/TA	-0.30	-0.14	1.00				
NPL/TL	-0.37	-0.33	0.07	1.00			
TE/TA	0.20	-0.28	-0.27	0.03	1.00		
DEP/TLI	-0.24	-0.23	0.53	0.10	-0.08	1.00	
TOE/TOI	-0.75	-0.64	0.24	0.29	-0.03	0.25	1.00
LOGTA	-0.10	0.23	0.48	0.04	-0.63	0.33	-0.09
NOI/TOI	0.32	0.21	-0.21	-0.06	0.14	-0.04	-0.43
GDP	0.12	0.13	0.03	-0.24	-0.07	-0.02	-0.27
INFL	0.33	0.27	-0.25	0.10	0.27	-0.32	-0.15
CONC	0.14	0.07	0.08	-0.22	0.17	0.24	-0.11
	LOGTA	**NOI/TOI**	**GDP**	**INFL**	**CONC**		
LOGTA	1.00						
NOI/TOI	-0.17	1.0000					
GDP	-0.05	0.1598	1.0000				
INFL	-0.28	0.0154	-0.1974	1.0000			

CONC	-0.29	0.4609	0.2724	0.0017	1.0000

Table 6: Correlation matrix
(Source: computed by author using Stata command)

According to Habshah Midi , S.K. Sarkar & Sohel Rana (2010), the threshold to accept a correlation coefficient is under 0.8. Otherwise, the multi-collinearity is considered as a serious problem. From the result extracted from Stata, not any correlation coefficients are above 0.8. Therefore, it can be confirmed that the problem of multi-collinearity does not exist in this regression.

To better ensure the validity of regression model, the research will test for heteroscedasticity and autocorrelation also known as serial correlation, the two most significant problems that can violate the assumptions of linear regression model if they occur (Schmidheiny, 2016). When the assumptions of linear regression model are violated, the linear regression model is no longer a trustworthy estimator.

First of all, autocorrelation or serial correlation is a phenomenon usually seen in time series analysis when the error terms of one period are transferred to future periods, in other words, the error terms from different time interval correlated with each other. Taking a look at panel data, it is also a group of observations over time and therefore, have the potential to face serial Correlation problem. It is said to be a problem because an overestimate or underestimate in the past can cause overestimate or underestimate in the future. However, the magnitude of serial Correlation also relies on what type of research and data are being used. For this research, as the length of time is only 10 years which is not significantly long so the serial Correlation can possibly be a minor problem. However, the author still tests for the existence of serial Correlation by using Wooldridge test (Drukker, 2003)

With ROA
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F(1, 16)= 2.624
Prob> F = 0.1261

With ROE
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F(1, 16)= 6.659
Prob> F = 0.0209

Table 7: Results of Wooldridge test
(Source: computed by author using Stata command)

According to the result in Table 7, test on ROA and ROE introduces p-value greater than significance level 1%. Therefore, there is not enough evidence to reject the null hypothesis which states that there is not first order auto-correlation at 1% significance level.

Secondly, the research carries out test for heteroscedasticity. One of the fundamental assumptions of linear regression is the homoscedasticity which implies that the error terms in a linear regression have equal variance with whatever value of the explanatory variables. Meanwhile, Heteroscedasticity represents the opposite case when variance value of errors term is not the same across different value of explanatory variables. Because the existence of heteroscedasticity will violate the very basic assumption of linear regression so it is crucial to test for it. The research uses the Breusch-Pagan / Cook-Weisberg test to examine the heteroscedasticity (Breusch & Pagan, 1979). The result is presented in Table 8 below:

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of ROA
Chi2(1) = 0.33
Prob> chi2 = 0.5673
Ho: Constant variance
Variables: fitted values of ROE
Chi2(1) = 2.42
Prob > chi2 = 0.1195

Table 8: Breusch-Pagan / Cook-Weisberg test
(Source: computed by author using Stata command)

The result in Table 8 shows that both p-values in two tests are greater than 1% significance level. Therefore, the research rejects the null hypothesis which is constant variance of error term. As a result, the research can firmly state that there is not heteroscedasticity in the regression model at 1% significant level.

After performing a range of major diagnostic tests, the final step is to decide between fixed effects model (FEM) and random effects model (REM). In FEM, the model accepts heterogeneity or individuality among different studied samples by allowing different intercepts for different cross-sectional units in the regression model. This means the model in this research will treat different banks as different units. Although the intercept may vary among individuals, it does not vary over time which, as a result, make up the term “fixed effects”. Meanwhile, in REM, there is an assumption that the intercept of an individual is a random unit which is equal to a constant mean value of a larger population (Baltagi, 2008). To decide between FEM and REM, Hausman test will be

performed using Stata software command (Schmidheiny, 2012) (See Appendix 2)

According to the results of Hausman tests for model with ROA and model ROE which are presented in Appendix 2, both tests show p-value smaller than significance level 1%. Therefore, there is enough evidence to reject the null hypothesis which states that the difference in coefficients is not systematic. In other words, fixed model will be employed for regression in this research.

RESULTS AND DISCUSSION

This chapter will present the result of the regression to decide if the proposed hypotheses should be accepted or rejected. Besides, comparison with other existing studies is also included together with analysis of possible reasons behind.

4.1 Descriptive Statistics

Before analysing the regression result, it is highly advised to take a look at the summary statistics of the data in order to understand the pattern of the dataset's variables and interpret them in a meaningful way.

Variable	Mean	Std. Dev.	Min	Max
ROA	0.8%	0.5%	0.0%	2.2%
ROE	10.3%	6.7%	0.0%	30.9%
TA (*)	209,000,000	223,000,000	5,240,389	1,010,000,000
TL/TA	54.6%	11.5%	32.5%	78.6%
NPL/TL	2.3%	1.6%	0.1%	11.7%
TE/TA	8.8%	3.9%	3.6%	29.3%
DEP/TLI	69.9%	13.2%	27.5%	96.7%
TOE/TOI	49.9%	14.2%	26.6%	92.7%
NOI/TOI	21.0%	13.6%	-17.8%	69.6%
GDP	6.0%	0.6%	5.3%	7.1%
INFL	8.9%	6.6%	0.9%	23.1%
CONC	68.9%	4.0%	61.5%	75.9%

**Note:* *TA is Total Assets with unit:Millions VND*

Table 9: Descriptive Statistics of Variables
(Source: computed by author using Stata command)

From descriptive analysis in table 9 above, there are several interesting points should be mentioned.

Mean of ROA and ROE is around 0.8% and 10.3%. The banking sector seems to have positive profitability during the research period. However, the mean values of ROA and ROA tend to be close the min value which indicates a fact that there are more low-profit banks in the market. The result is quite close to that of Batten & Vo (2014). The difference between Min and Max value of ROA and ROE also signifies the high volatility of the banks during 2007 and 2016.

Another interesting figure is the standard deviation of ROA and ROE which is 0.5% and 6.7%. These numbers are smaller than that of Chinese banks in García-Herrero, Gavilá, and Santabárbara (2009), Philippines Banks in Sufian & Chong (2008) and Sri Lanka Banks in Weersainghe & Perera (2013) which can somehow indicate that the profitability of Vietnamese banks is generally less volatile than countries in same region.

Regarding the TA or total assets of banks, it can be seen there is a huge difference between the Min and Max values. Besides, the mean value which tends to be significantly closer to the Min value. Therefore, it can be claimed that there are a majority of small-sized and medium-sized banks while the number of giant banks is quite small in the banking market. However, these giant banks can occupy more than 50% of the market with their size many times bigger than small and medium-sized banks.

Looking at the total loans over total asset ratio which is denoted as “tlta” in Stata Software, the mean value is around 54.6%. Hence, Loans still plays as a major asset in the banks business. This is in line with the situation of Chinese banking sector when García-Herrero et al. (2009) calculate, on average, the loans percentage in Chinese banks are around 50%.

Similar to loans given to customers, the customer deposit besides equity undeniably still plays the key role as the most important financing medium for Vietnamese banks during the research period. On average, 69.9% of total liabilities of banks are from customer deposits which is denoted as “deptli” in Stata software. Local Commercial banks in Vietnam generally strictly preserve their traditional role when most of them solely provide lending and borrowing activities while modern banking model should provide more diversified business activities for customers.

Noticeably the credit risk which is measured by the total NPLs (NPLs) to total loans given to customer (denoted as “npltli” in Stata) is a problem during this period. The mean value for NPLs is around 2.3% which is lower than 5.1% of European Banks but still higher than 1.5% of mature and stable markets such as Japan and America in the end of 2016 (European Systemic Risk Board, 2017). With the maximum NPLs ratio around 10%, several banks in Vietnam are having significant trouble with bad borrowers.

Income from sources other than interest rate is still limited when closely looking at the non-interest income over total operating income denoted as “noitoi” in Stata software. The mean value of non-interest income over total operating income is rather low at around 21% while the minimum values in some sample banks even go below 0%. This reveals the fact that commercial banks rely solely on interest rate income while in some exceptional banks, the net interest income may cover the losses in other non-interest income business of the banks.

The operation efficiency (“toetoi in Stata) which is measured by total operating expense to total operating income on average is around 49.9% with relative higher standard deviation than other explanatory variables. Higher standard deviation implies big difference in how effectively each bank manages their businesses.

As for external factors, the growth rate of GDP is on average around 6% per year while standard deviation is quite low at 0.5%. The economy in Vietnam have been quite stable due to the closely regulation by local government. However, the inflation rate is quite high and fluctuating. Inflation rate on average is almost 9% during 10 years while most countries in South East Asia have much lower inflation rate. In 2011 the inflation rate is more than 18% while the most recent year 2016 is only 2.7%. Fluctuating inflation rate can be a potential determinant of profitability due to the fact that Vietnamese commercial bank income relies solely on interest rate income. More important, the concentration in banking industry is quite intensive with top 5 largest banks on average during the past 10 years occupying more than 65% of the total market asset. It might give the top banks market power to create monopoly and affect the profitability.

4.2 Regression result

	ROE			**ROA**		
	Fixed effects model			**Fixed effects model**		
Variables	**Coef.**	**Std. Err.**	**P>|t|**	**Coef.**	**Std. Err.**	**P>|t|**
TL/TA	0.077	0.0519	0.140	0.004	0.003	0.271
NPL/TL	-0.390***	0.2204	0.079	-0.039*	0.015	0.009
TE/TA	-0.430*	0.1270	0.010	0.013	0.008	0.115
DEP/TLI	-0.120*	0.0404	0.003	-0.004	0.003	0.106
TOE/TOI	-0.245*	0.0364	0.000	-0.024*	0.002	0.000
LOGTA	0.026	0.0210	0.220	-0.001	0.001	0.563
NOI/TOI	-0.035	0.0330	0.916	0.000	0.002	0.843
GDP	-0.458	0.5920	0.440	-0.066***	0.039	0.096

INFL	0.277*	0.0646	0.000	0.013*	0.004	0.004
CONC	0.238**	0.1197	0.048	0.006	0.008	0.488
R-squared overall		58%			64%	
Number of observations		160			160	
Prob>(test statistic)		0.000			0.000	

Note: *t-statistics in parentheses; *** p<0.1, ** p<0.05, * p<0.01*

Table 10: Regression results
(Source: computed and briefed by author)

The table 10 above presents the regression result for ROA and ROE using Fixed effects model. There are 160 observations including 16 commercial banks over 10 years employed to run the models. The R-squared reflects the percentage of variance of dependent variables that can be explained by the independent variables of model. R-squared for ROA and ROE models are both high at 63% and 58% respectively. The P-values for F-test of 2 models, which are the probability that all coefficients in models are zero, is equal to 0.0000. It is smaller than the significant level 1% so the models can be confirmed to be statistically significant enough.

Based on the result of the regression, a summary of the acceptance of rejection of the proposed hypothesis is presented in table 11 below:

Description	**Symbol**	**Hypothesis**	**Expected effect**	**Result**
Assets structure	TL/TA	H1	+	Rejected
Asset quality (Credit Risk)	NPL/TL	H2	-	Accepted
Capitalization	EQU/TA	H3	+	Partly Accepted (-)
Financing structure	DEP/TLI	H4	+/-	Partly Accepted (-)

Operating efficiency	TOE/TOI	H5	+	Accepted
Bank size	logTA	H6	+/-	Rejected
Income diversification	NOI/TOI	H7	+/-	Rejected
GDP	GDP	H8	+	Partly Accepted
Inflation	INF	H9	+	Accepted
Market concentration	CONC	H10	-	Partly Accepted

Table 11: Summary of results
(Source: prepared by author)

4.3 Internal factors

4.3.1 Assets structure (loans level)

Since total assets of a commercial bank are majorly comprised of loans given to customer, the assets structure will be indicated the proportion of loans given to customers over the total asset. Loans are major source of income as can be seen from its mean value during examined period which was always above 50%. However, opposite with the expectation, the result shows insignificant relationship between the customer loans and profitability even at 10% significance level. Therefore, the null hypothesis is rejected.

The result is quite surprised as it is obviously against most existing literature on the role of loans over a commercial banks profitability such as Naceur (2003) in Tunisia and Guru et al. (2002) in Malaysia. In Vietnam, while the study of Batten & Vo (2014) does not include loans into their research, Dinh (2013) suggests that loans have can significantly motivate the profitability. However, it should be noticed that the magnitude of coefficients in research of Dinh (2013) is rather small at 0.005 which is much smaller than other variables' coefficients. As a result, it could be interpreted in a way that the level of loans can possibly

explain the change in profitability but it is not statistically meaningful or at a very considerably small extent. In this research, there is extension in the period compared to the research of Batten & Vo (2014) who only covers the period until 2012. There might be certain change in the environment that led to the slight difference in result. Besides, it can be inferred from this research that factors other than loan could have better power in explaining the change of commercial banks profitability during the period from 2007 to 2016 in Vietnam.

4.3.2 Asset quality (Non-performing loans)

To evaluate the credit risk, the research uses quality of loans given to customer rather than loans loss provision used by Batten & Vo (2014) and Dinh (2013). Most of banks assets are loans given to their customers which make loans quality become the most important indicator of the bank assets quality. While the result does not imply any significant relationship between the asset structure, the quality of the asset seems to have significant effect on profitability especially in term of ROE. Coefficients in ROE and ROA models are negative and significant at 10% and 1% respectively.

The result goes along with other existing empirical studies such as Liu & Wilson (2010) in Japan, Athanasoglou et al. (2008) in Greece or Sufian & Chong (2008) in Philippines who also found a negative relationship between credit risk and profitability despite the fact that they used different indicator which is Loan loss provision over total loans. This research's result is considered sound and appropriate as higher NPLs ratio means higher rate of bad borrower which can erode a bank's interest income. The case can be worse when banks have to consider writing off the default loans which mean the bank have to declare the loan to be non-collectible and record it as a loss in income statement. Moreover, high number of NPLs will make bank management level to endure higher costs

in order to supervise those loans. As a result, that will lead to erosion in the annual return of banks.

However, there is one point should be noticed that the NPLs classification standard in Vietnam does not always correctly reflect the actual situation of the banks due to poor execution in reporting and data manipulation from management level. In order to achieve a short-term profit, managers can attempt to bypass important standards issued by SBV and hide the banks' real status. Therefore, the actual setback can be worse than measured.

4.3.3 Capitalization (Equity level)

The level of equity is expected to have potential effects on banks' profitability. As per the outcome of regression model, it could be noticed that the capitalization is strongly significant at 1% for ROE fixed-effects model while different result is presented for ROA as the p-value is now quite high in order to accept the null hypothesis. However, interestingly, the direction of effect is not as expected when it produces a negative coefficient which reflects the negative affect of capitalization of a bank on ROE.

This mixed results can be easily perceived due to the fact the ROE is calculated on the basis of net income over the equity amount. Therefore, the more equity is invested, the lower the ratio of ROE is. More important, the difference results between ROA and ROE can also imply a potential side effects of raising higher capital in the banks which can slow down the profitability.

This mixed results of capitalization on ROA and ROE are in agreement with the research of Guru et al. (2002) Malaysia. They also experience the negatively significant relationship of capitalization on ROE while rejecting the connection of capital and equity level with ROA. In many occasions, commercial banks use debts to leverage the return for shareholders. However, this behaviour carries a potential risk of financial distress or bankruptcy of a bank during financial

difficulties. It can even lead to the collapse of a bank. Looking back at the US bank history, the collapse of Lehman Brother bank in 2008 has put US economy and banking system in a serious crisis also known as debt crisis where many borrowing banks fail to repay their debts. Therefore, Guru et al. (2002) present the idea of trade-off between risk and profitability as capital help to reduce the bank's dependence on borrowing sources and hence, lower the risk of bankruptcy.

During the period after the financial crisis in 2008, difficulties in financial market and economy have forced many Vietnamese banks to scale down their sizes while enriching their capital as a safety requirement from the SBV. This is to ensure a healthy banking system to avoid the risk of bankruptcy in commercial banks since a significant level of capitalization can be used as a shield against the credit risk. Therefore, there have been great injection of capital to the banks for the reason of safety requirement rather than for the purpose of business expansion during this sensitive period from 2007 to 2016. It could be seen from the data that each year, there are always significant raise in capital on each bank.

4.3.4 Financing structure (Deposits level)

Although most reviewed literature does not pay attention to the role of deposit, the finding of this research suggested that in the Vietnamese banking system context, deposits could be a significantly influential factor to determine the profitability. It is quite obviously when descriptive result shows a high mean value at around 70%. That means on average more than 70% of liabilities are customer deposits.

The result from regression shows that the level of deposit is statistically significant in fixed effects model of ROE at 1% while there is no significant result for ROA model. The direction of impact is negative which support the

claim of Dinh (2013) about the impact of deposit on profitability. However, it contradicts the findings of Sufian (2012) in South Asian countries who claim that bigger banks with relative higher deposit level compared with smaller banks could earn more return. This claim implicitly implies the role the size of banks. He assumes the connection between deposit ratio and the branches network of the banks which is believed to have a certain economy of scale effect on the profitability. The larger the branch network is, the more chances a bank have to attract more depositors.

However, Sufian (2012)'s theory might not be the main driver in case of Vietnam. The negative effect of deposits in Vietnam banking system could be explained by the mainly traditional business of banks. It is common to hear about the term "Interest rate competition" in Vietnam according to many bankers who are working in the field. Instead service & product quality, the fact is that local banks mostly compete with each other using higher deposit interest rate to customers which sometimes lead to a so-called "interest rate war". It signifies the fact that banking sector in Vietnam has not passed the primitive development stage yet. Besides this explanation, it also implies that extending fund raising without a proper and effective U.S.Age can cause the waste of fund and result in low profit.

4.3.5 Operating efficiency

As for the efficiency in operation, P-values are at 0.000 in both models of ROA and ROE suggest the result is strongly statistically significant at 1% level. The negative coefficient of variable total operating expense over total operating income implies that the lower the ratio or the higher of the efficiency will enhance the profitability. The result is strongly supported by the results of other research especially Weersainghe & Perera (2013) in Sri Lanka who also use cost over income ratio to reflect the efficiency of the banks. A low cost to income

ratio indicates the good management from the banks when dealing with bank administration. Although other reviewed literature uses different indicators to evaluate the operating efficiency such as expense over total asset, the supporting ideas are quite the same by calculating the balance between the input needed to produce a certain amount of income or assets.

4.3.6 Bank size

Opposite with what was expected in the hypothesis development section, bank size indicated by logarithm of total asset is not statistically significant in both ROE and ROA model. Although there are mixed finding regarding effect of bank size in existing literature, the result is consistent with findings from Dinh (2013) in Vietnam context. He found the size of bank have significant impacts on profitability of foreign banks but size variable does not turn out to be important in the local commercial banks in Vietnam. Both results of this research and Dinh (2013) contradicts the result of Batten & Vo (2014) as they claim the existence of a relationship between size and profitability. However, the magnitude of their outcome for variable Size's coefficient is quite small. This research's result is also supported by the findings of Athanasoglou et al. (2008) in Greek banks. Therefore, they altogether might hint a message that the size of the bank does not necessarily bring in neither competitive advantage or disadvantages for the banks in the case of Vietnam. The profitability of Vietnamese bank depends more on other factors such as administration, strategy, vision and skills of management level or operational efficiency.

4.3.7 Income diversification (Non-interest income level)

Within the scope of this research, Diversification is indicated by percent of non-interest income over total operating income. The higher the level of diversification is indicated by a high level of non-interest income . In a modern and dynamic business environment, banks tend to diversify their business by not

only relying on lending and borrowing activities but also extensively stretch their businesses into other services to earn fees and premiums or service charges. As mentioned above, the idea of income diversification is expected to have a certain role in determining the profitability of banks in Vietnam due to the increasingly important role of commercial banks in the economy. However, surprisingly, in Vietnam's context, the outcome shows that there is statistically significant negative relationship between diversification and profitability in both ROA and ROE models. The coefficient for ROE model is negative which means more earnings from Non-interest activities would be likely to slow dow the profitability. While in ROA model, the coefficient is equal zero. In other words, there is no evidence that a more diversified business help motivate the profitability of the bank. The negative coefficient in ROE model could also imply an erosion in profitability if the business is diversified. The result contradicts many findings of other existing research such as Sufian & Chong (2008), Liu & Wilson (2010), Sufian (2012) in Asian region. However, this difference can be properly explained due to the fact that in Vietnam, most of the banks have more than 70% of the operating income resulted from net interest margin. In some banks, income from Interest even helps to cover the loss of other businesses. Interest is clearly the main driver of their profit. As Liu & Wilson (2010) described in their research in Japan: "banks with higher product diversification (higher non-operating-income weight) exhibit lower interest margins". Diversification can improve profitability which are ROA and ROE in some studies. However, it is not necessarily true especially when banks reply heavily on the income from net interest margin. This interpretation is quite true in Vietnam's local banks.

4.4 External factors

4.4.1 GDP growth rate

Surprisingly, GDP growth rate shows negative effects on profitability in both ROA and ROE model. However, the result is only statistically significant in ROA at 10% significance level with very low coefficient at -0.066. The result supports the finding of Dinh (2013) but it is inconsistent with the finding of Batten & Vo (2014). Overall, this is interesting because the result contradicts findings of most previous research who claim the existence of cyclical movements in profitability. GDP growth rate is believed to have certain significant impact as stated by most existing researchers. While Athanasoglou et al. (2008), Sufian & Chong (2008), Sufian (2012) findings suggest an association between economic growth and profitability. Liu & Wilson (2010) in Japan prove that this relationship is negative in Japanese banks. The result is only in line with Naceur (2003) and Weersainghe & Perera (2013) about the irrelevance of economic growth. This is might be because economic growth does not necessarily reflect the improvement in banking environment. A growing economy might benefit different sectors from which the bank's customers is coming from. However, factors such as regulation in banking sector, technology advance may be the constrains to prevent banks from enjoy the economic growth.

4.4.2 Inflation

In contrast with GDP growth rate, inflation variable turns out to be significant in both model of ROA and ROE at 1% significance level with a positive effect as expected in the hypothesis development section. The result is in line with Batten & Vo (2014) but contradicts the result of Dinh (2013) as he proved that inflation should erode the banks' profitability. However, this research and Batten & Vo (2014) is strongly supported by different studies such as Guru et al (2002),

García-herrero et al. (2009), Athanasoglou et al. (2006), Athanasoglou et al. (2008). The result can be easily explained by the fact that inflation directly affects the interesting rate settings of commercial bank while interest rate is still the major income source of Vietnamese commercial banks. The result reveals the ability of banks in Vietnam in forecasting the change of inflation rate to better adjust the nominal interest rate used for lending and borrowing activities and achieve better return. Therefore, banks could actually benefit from the movement of inflation rate.

4.4.3 Market concentration

Market concentration is the total assets of top 5 largest banks to the whole market (CONC) which help measure the monopoly and competition situation within the market. The outcome suggests a significant association between ROE with the concentration level at 10%. However, the positive finding in this research is not consistent with finding with research in China of García-herrero et al. (2009) who find out the evidence to support the theory that a less concentrated banking industry may support the bank profitability. As a matter of fact, the banking market in Vietnam has been dominated by state-owned banks for long time. The market is not competitive which make the bank to be able to price their services unfavourable for customers. The profitability is mainly supported by manipulated market rather than the competitive efficiency. During the downtrend from 2007 to 2016, a deconcentrated market and stronger competition have played a key role which lower down the level of profitability. The research's result is consistent with findings from Antonio Trujillo-Ponce (2012) in Spain and Claeys and Vander Vennet (2008) in Eastern Europe who emphasize the effect of market-power hypothesis or also known as structure-conduct-performance hypothesis. It is said that the banks in a concentrated market like Vietnam, can actually benefit from the market power which allows the banks to price their products and service unfavourable for the customer.

Most market shares belong to a small group of bank with the power to affect the market. Therefore, they can intervene the market with the power to manipulate the price setting of market interest rate. However, when this market-power hypothesis loses its effect and competition increases, banks can suffer from the slowdown of profitability.

CONCLUSIONS

Following the analysis chapter, the last chapter will be used to present the conclusion on what have been discussed so far. This chapter also takes a look at the existing limitations as well as provides some suggestion for practitioner

5.1 Conclusion

The overall purpose of the research is to examine which factors could significantly drive the profitability of the commercial banks in Vietnam. Different research questions have to be addressed in order to achieve the stated purpose including:

- *What are the potential factors that can drive or determine profitability of local commercial banks in Vietnam?*
- *In which way do these factors affect the bank profitability?*
- *Are there any significant relationships between those factors and the bank profitability?*

After reviewing existing studies on this topic in some major developing countries which have similar economic conditions to Vietnam, the research picks up potential variables that were used in prior studies and carries out an empirical study in Vietnam to examine possible impacts of those variables. There are two groups of variable which are the external variable or macro-economic variables and internal variables. The top 16 largest commercial banks in Vietnam whose market shares cover more than 80% of the total market assets from 2007 to 2016 are selected accordingly to properly represent the banking sector in Vietnam. Multiple linear regression analysis for panel data is employed to achieve the purpose of the research.

The final result points out that capitalization, asset quality as well as ability to maintain operating efficiency play the most vital roles in explaining the change in profitability of Vietnam's local commercial banks. Besides, macro-economic factors such as inflation and also the concentration level of banking sector could also significantly impact profitability.

Several key findings are presented as below:

(1) *Profitability of banking sector is following a downtrend recently*

(2) *The structure of assets, bank size and the diversification is not significant in explaining the change in profitability*

(3) *The quality of asset and the ability to control administration expense are among the most major important drivers of profit during the examined period*

(4) *Banks with more invested capital tend to earn lower profit than those who use higher leverage*

(5) *Financing the activities by customer deposits can result in lower profitability*

(6) *Banking sector performance can be significantly correlated with macro-economic factors such as economic cycle or inflation rate*

(7) *Less market concentration level seems to decrease the profitability of banking sector*

From the data collected from sample banks, a down trend from 2007 until 2016 can be clearly observed. Different drivers for this trend are analysed on the basis of the key findings of this research.

While assets structure does not provide a clear and significant impact on profitability, the quality of the assets turns out to be an important factor that could determine the change of profitability. On average, more than 50% of bank's asset in Vietnam are loans to customers. They are the most majority

earning assets of commercial banks. Therefore, loans quality reflects clearly the quality of bank's assets. A high proportion of non-performing loans raise the possibility of credit risk. During the economic downturn, high level of non-performing loans will require banks to spend extra resource to supervise those bad loans. Besides, loan loss provision will hit the bottom line of the bank directly. Therefore, most of Profit earned will decrease along with the surge in the percentage of non-performing loans.

It is interesting to figure out that in Vietnam context, both bank size and income diversification are not relevant in the context of Vietnam. Usually, when an ordinary business getting bigger in scale, it will earn the benefit of economies of scale which is the cost advantage while sales increases. However, it seems like due to the distinction of banking sector in Vietnam, the theory of economies of scale does not apply. As a part of a developing economy, commercial banks in Vietnam is still underdeveloped. The skills and administration knowledge of management level are still limited. When the economy goes to further development, bigger and more extensive operation reveals the limitation of poor management skills. As a result, commercial banks in Vietnam fail to take advantage of economies of scale. While diversification is a popular trend in modern banking sector, commercial bank system in Vietnam is still reluctant to follow it. Vietnam's commercial banks gain the most characteristics of a developing economy which is heavy reliance on income from interest rate and poor range of fee-based services. They have to earn most of income from lending and borrowing activities. Therefore, if a bank tries to extend its business further, it surely will have to give up parts of its common profit from interest-based activities which reduce the profitability in the end of the day.

The final results also highlight the importance of operating efficiency or the bank's ability to control administration cost. A high cost to income ratio will highly likely to erode the return of banks. During the examined period, the

average ratio of total operating expense to total operating income tend to increase gradually while ROE and ROA tend to slowly decrease as can be seen in Figure 6 below:

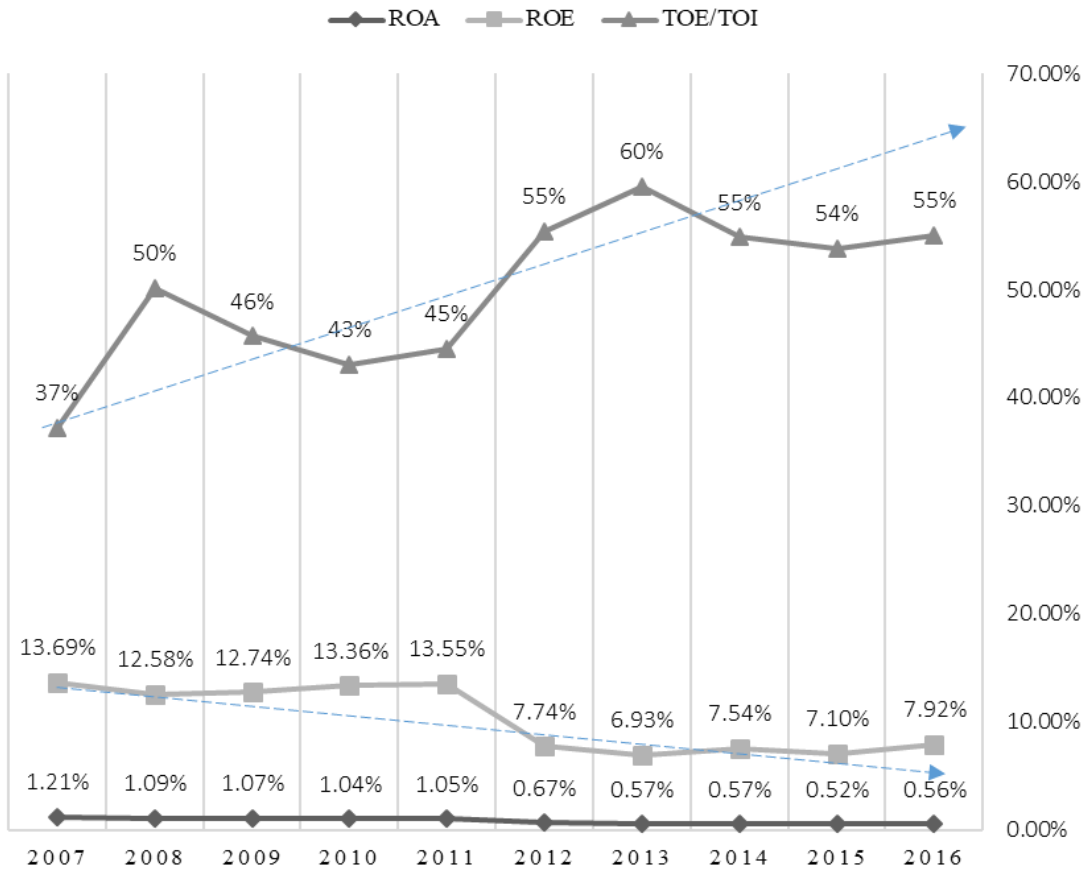


Figure 6: Operating efficiency vs profitability
(source: author)

The average ratio of total operating expense to total operating income from 15 selected banks was 37% in 2007 but it reached 55% in 2006. This means it required much more resource to produce the same amount of value in 2016 than in 2007. These facts and figures were proved to be the key driver of bank's profitability in this research.

Capitalization is proved to have different effects on 2 models or ROA and ROE. High level of equity tend to support the increase in ROA but the relationship is not statistically significant. Its relationship with ROE is considerably significant

but with a negative effect. The increase in equity level during the research period seems to be more about safety requirement rather than expansion in business. It seems that banks with more invested capital tend to earn lower profit than those who use higher leverage. During the period from 2007 to 2016, SBV has strongly demanded local banks to raise the level of capital to fully comply with Basel 2, an international banking regulatory accord which is proposed by the Basel Committee on Banking Supervision. The main point of Basel 2 is capital standard to ensure that bank have an emergency reserve to absorb different risk. Application of Basel 2 standards is part of the plan to restructure and empower the banking sector of SBV with aims to operate safely and effectively especially after the financial economic crisis in 2008. Therefore, the raise of capital during this period is to serve the safety purpose rather the business expansion purpose. More invested capital also creates a challenge for banks which is how to utilize the additional capital to earn profit. As a result, the raise in capital could reduce the profitability level of the banks.

Beside capitalization, the financing structure in liability of banks is also taken into consideration. However, it is only significant in association with ROE. A negative effect implies that a heavy reliance on deposits from customer could decrease the profitability. Financing by deposit may be an unstable source especially in period of interest rate fluctuation. It should be noticed that most of the banks in Vietnam are small and medium-sized banks. Their business relies mainly on interest-based activities. So in order to compete, they usually compete on basis of interest rates to attract customer. Pricing competition becomes fierce in the time of crisis which make the banks have to pay higher for customer in order to maintain a strong customer base. This, in turn, reduces the profitability of the banks.

Meanwhile, macro-economic factor shows different results between ROA and ROE models. The economic growth indicated by GDP growth rate is not

relevant in Vietnamese context but the newly introduced factor, market concentration turns out to be highly significant as it strongly affects the profitability in positive direction. The affect can be visualized via figure 7.

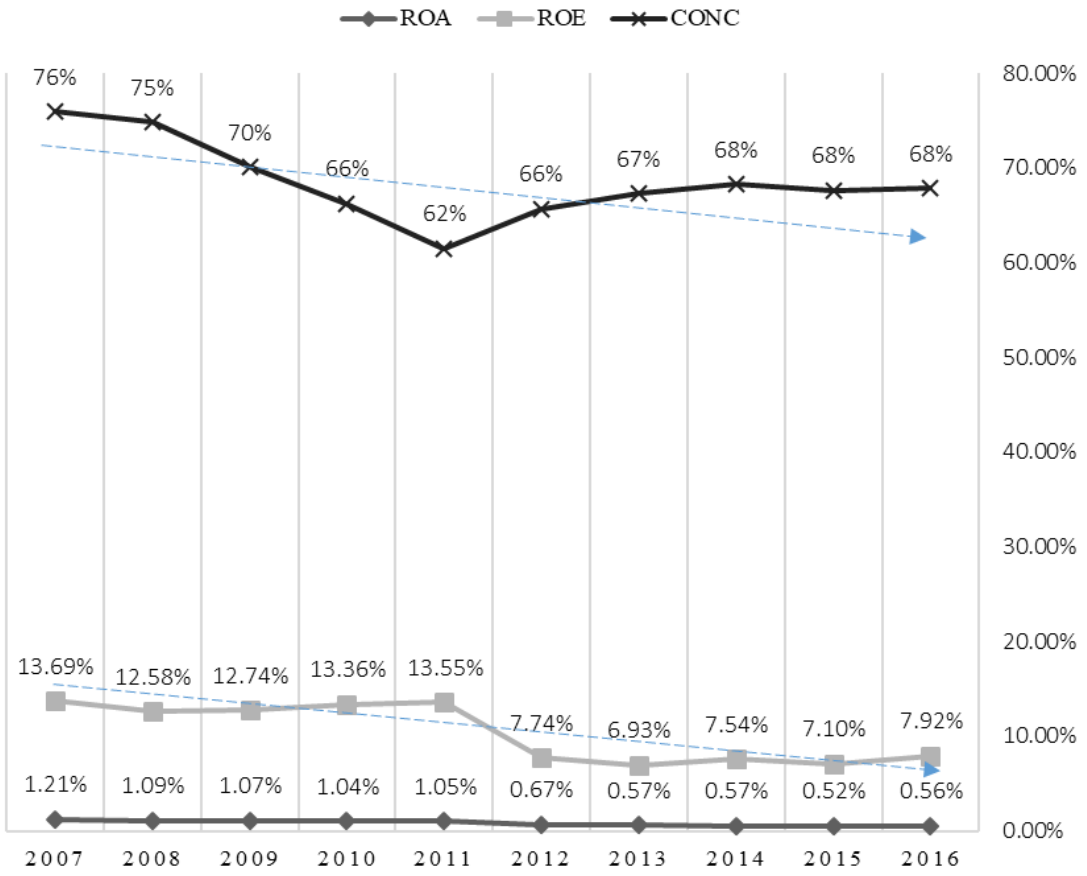


Figure7: Concentration vs profitability
(source: author)

The result supports the findings in Spain but challenges findings from China of García-herrero et al. (2009) and Batten & Vo (2014). The more concentrated the market indicate more power for the banks to manipulate the market and set the rate which is unfavourable for customers. Banking sector in Vietnam has earned profit from the low competitiveness of the market for a long time. However, when the market is deregulated and open up to the world, local banks began to feel the competition. The profitability is significantly hit by a low level of concentration and high level of competition.

When it comes to inflation, this variable is positively correlated with ROE which implies that local banks could possibly benefit from the inflationary economy in Vietnam.

This research contributes to the existing research on this topic in Vietnam situation by making a comprehensive approach and adding more potentially significant variables which are financing structure, operating efficiency and especially income diversification and market concentration. While Loan loss provision is commonly used in 2 existing studies of Dinh (2013), Batten & Vo (2014) in Vietnam and many other studies in the region, this research choose to replace it with a less biased indicator which is the percentage of NPLs over total loans. Besides, the research extends the time frame of evaluation until 2016 to better reflect any changes during this recent period such as accession to WTO in 2007 and financial crisis in 2008.

5.2 Managerial implications

From the key findings discussed above, several managerial implications are presented:

For the SBV and the government, asset quality, among the most important factors that have influence on profitability, should be carefully reviewed. The increase of NPLs in recent years have resulted in the erosion of profitability. Despite the fact the national banking sector authority has been actively following Basel Accord, and international regulatory framework for banks, there is still a lot of efforts needed to improve from within the banking sector. Poor assets quality is mostly coming from the risky business of the banks. Some banks do not hesitate to put money in risky projects such as real estate properties or gambling stock investment. Competition to acquire bigger customer bases also leads to unhealthy business of the banks. More important, the poor asset quality reported in the documents of the banks may not reflect the actual

situation due to the little transparency in operation of Vietnamese banks and the gap in reporting standards which can be manipulated by the banks. Therefore, it is highly suggested that the authority should review the reporting standard to help better reflect the actual situation while strictly enforcing policies to control the non-performing loans level. For example, credit expansion can only be done if the banks can maintain a certain safety level of Non-performing loans.

Besides, requirement for higher capitalization is also a result from the fact that NPLs is becoming a real issue in Vietnam. Higher invested capital to ensure the controlled solvency risk can result in lower profitability. However, it is understandable and acceptable especially in the period of economic difficulty. Banking authority should consider a trade-off between profitability and safety of financial system. A low but sustainable profitability is more appreciated than a high but risky profitability. The decision to follow Basel Accord of the government is strongly appreciated. This is a wise move to reshape the banking industry in Vietnam. In 2014, SBV also released the circular 36 which set the limitation for activities of banks on the basis of available capital. This research suggests that the government stick with strong and aggressive capital policy. It will be a strong base for further expansion of commercial banks in near future.

As pointed out in this research, the high fragmentation and concentration of the banking sector have brought some challenges for its development. The number of smalls banks is huge but their performances are not good enough. Meanwhile, few large banks have dominated the market for a long time which negatively affects the competition. The research suggests the authority in banking sector should motivate the M&A activities between small banks to make up fewer players in the market but with a better financial strength to compete with local and foreign banks. It is better to focus on quality than quantity. Moreover, a market with a fair number of strong players is much easier to administrate.

Regarding diversification which is indicated by percent of net interest income over total asset, the lower the percentage is, the higher the level of diversification is. Surprisingly, the effect is negative. It is considered as the most important factor in determining profitability of the bank. Although borrowing and lending activity still the driver to bring the major part of income to the bank, they are not steady and stable source as proved in previous studies. Non-interest income such as payment service, investment, fee-based services can bring better and more stable profit for the banks in long term. As result, similar to capitalization, despite the fact the result is not as expected, the bank management level should be always aware of the need for a diversified business. This research suggests banks should gradually extend the business to more feed-based serviced to better diversify the activity. Solely reliance on lending and borrowing activities can easily become highly risky during economic downturn. Moreover, when the competition in the market is high, the quality and diversification in services would be a key to competitive advantage.

Although GPD growth rate seems unlikely to affect the profitability in Vietnam context, it is highly advised the variable should be closely followed since it has indirect linkage to different sectors in the economy. Role of banks is to cater the need for funding and savings for customers in those sectors so they could indirectly affect the banking sector if other sectors have unhealthy status.

5.3 Limitation & direction for future research

Although this research provides a more comprehensive approach to supplement the previous studies in Vietnam, there are still several limitations regarding the construction of the research. First of all, the selection of variables is still limited at certain extent. Several potential factors such as interest rate, financial standard requirement (Basel Accord), ownership type, banks' history, market shares are not included due to the complex analysis needed and the unavailability of data.

Second of all, the data collected from different banks can follow different accounting standards which makes it quite difficult to deal with analysis. Finally, due to the scope of the research, indicators chosen for each selected variables are quite simple. Most of them are simple ratio based indicators. Therefore, they might not be able to reflect the full scale of the mentioned issues.

Further research can involve more relevant factors to better reflect the important determinants of profitability. Distinction in the ownership in the banking market of Vietnam should also be incorporated to provide an outcome that better reflect the context of Vietnam.

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APPENDIX

Appendix 1: Selected sample banks with total assets (Unit: billion VND)

	Name of Bank	Symbol	Total Asset
1	Vietnam Bank for Agriculture and Rural Development	AGR	1,011,204
2	Bank for Investment and Development of Vietnam	BID	1,006,404
3	Vietnam Joint-stock Commercial Bank for Industry and Trade	CTG	948,699
4	Joint-stock Commercial Bank for Foreign Trade of Vietnam	VCB	787,906
5	Saigon Joint-stock Commercial Bank	SCB	361,682
6	Saigon Thuong Tin Commercial Joint-stock Bank	STB	332,023
7	Military Commercial Joint Bank	MBB	256,258
8	Vietnam Technological and Commercial Joint-stock Bank	TCB	235,363
9	Saigon-Hanoi Commercial Joint-stock Bank	SHB	233,947
10	Asia Commercial Bank	ACB	233,680
11	Vietnam Prosperity Commercial Joint-stock Bank	VPB	228,770
12	Vietnam Export Import Commercial Joint-stock Bank	EIB	128,801
13	Vietnam International Commercial Joint-stock Bank	VIB	104,516
14	An Binh Commercial Joint-stock Bank	ABB	74,171
15	National Citizen Commercial Joint-stock Bank	NCB	69,011
16	Nam A Commercial Joint-stock Bank	NAB	42,851

Total assets as of 31/12/2016: **6,055,293,987**

Total assets of the banking sector as of 31/12/2016 **7,284,771,000**

(Source: SBV)

Percentage of selected banks over banking sector : 83%

Appendix 2: Hausman test with ROA & ROE

Hausman test with ROA

Coefficients	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B))
TL/TA	0.004	0.001	0.003	0.002
NPL/TL	-0.039	-0.046	0.007	.
TE/TA	0.013	0.012	0.001	0.002
DEP/TLI	-0.004	-0.002	-0.003	0.001
TOE/TOI	-0.024	-0.025	0.001	0.001
LOGTA	-0.001	-0.001	-0.000	0.001
NOI/TOI	-0.000	-0.001	0.000	0.001
GDP	-0.066	-0.067	0.001	.
INFL	0.013	0.014	-0.001	0.002
CONC	0.006	0.005	0.001	0.003

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 127.95

Prob>chi2 = 0.0000

(V_b-V_B is not positive definite)

Hausman test with ROA

Coefficients	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B))
TL/TA	0.077	0.018	0.059	0.030
NPL/TL	-0.390	-0.516	0.126	0.030
TE/TA	-0.430	-0.482	0.052	0.042
DEP/TLI	-0.120	-0.076	-0.045	0.018
TOE/TOI	-0.246	-0.250	0.004	0.015
LOGTA	0.026	0.019	0.007	0.016
NOI/TOI	0.003	-0.005	0.008	0.010
GDP	-0.458	-0.472	0.014	.
INFL	0.277	0.274	0.002	0.031
CONC	0.239	0.199	0.039	0.046

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 29.38

Prob>chi2 = 0.0011

(V_b-V_B is not positive definite)