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Factors Affecting Bad Debt in the Vietnam Commercial Banks

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Abstract

The paper examines the factors affecting bad debts of Vietnamese commercial banks in the period of 2012-2018. On the basis of theory and previous empirical studies on the factors affecting NPLs, in combination with the use of GMM method, the author has built a model of eight variables affecting NPLs. However, the research results show that there are five variables affecting bad debt. Statistically significant variables are business performance, bank size, credit growth, gross domestic product growth and inflation rate. The final estimation model is effective because the defects have been tested so there is not any deficiencies in the model. Based on the research results, the author proposes a number of related recommendations to manage and control bad debts and improve business performance of Vietnamese commercial banks.

Keywords: Bad Debts, Business Performance, Bank Size, Credit Growth, Commercial Banks

1. Introduction

Credit growth in recent years has also led to a rapid increase in the NPL ratio at banks. When the bad debt increases will adversely affect many entities in the economy, firstly the banks themselves and the borrowers, then affect the whole economy. Banks can assess, measure, and understand bad debt first of all to understand what factors will affect bad debt. With the purpose of understanding as well as contributing theoretical and practical contributions, the authors studied the factors affecting NPLs at Vietnamese commercial banks.

Regarding the bad debt settlement results determined under Resolution 42, from 2012 to the end of March 2019, the entire credit institution system has handled VND 907.33 trillion of bad debts, of which in 2018, the whole credit institution system has handled VND 163.14 trillion of bad debts, the ratio of bad debts in the balance sheet to the end of March 2019 was 2.02%. Accumulated from August 15, 2017 to the end of March 2019, the whole credit institution system handled VND 227.86 trillion of bad debt determined in accordance with Resolution 42, of which the settlement NPLs off balance sheet is 117, 8 trillion. (Vietnam State Bank Information Page, Results of operating monetary policy and banking activities in the first months of 2019, orientation for the last months of 2019, visit <https://sbv.gov.vn>). Thereby we see Vietnam's efforts to resolve and limit the rise of bad debts, but the rate is still relatively high compared to the world.

Determining the factors affecting bad debt in banks as well as the level of impact of each factor will help banks' administrators to make effective decisions to maintain bad debt ratio at low, ensure the stable economic development.

2. Theoretical basis and experimental researches

Shrieves and Dahl (1991), two authors conducted a study of 1800 bank data sets in the US between 1984 and 1986. The authors studied the relationship between equity and bad debt, empirical evidence showed a positive relationship between the ratio of equity to total assets and non-performing loans. Keeton (1999), using data from commercial banks in the US from 1982 to 1996, authored a study on the relationship between credit growth and bad debt. The study shows a strong relationship between credit growth and non-performing loans. Specifically, Keeton said that rapid credit growth but low credit standards will contribute to higher bad debt in some states in the United States.

Hu et al (2006) through a table data set with 40 Taiwanese commercial banks during 1996-1999 to empirically analyze the factors affecting bad debt. In 1991, 18 Taiwanese governments issued a decree to promote the establishment of a commercial bank to reduce legal barriers to penetrate its banking market. Banks established after 1991 have a different culture and / or business strategy than those established before 1991. Moreover, the older the bank, the more bad debt accumulates over the years. Therefore, this study includes a dummy variable to show whether the bank was established before or after 1991. Based on the Hausman test, the random effect model has been shown to be better than the fixed effect model. The main empirical findings in this paper are: (1) the ratio of non-performing loans decreases as the government's share in a bank increases (up to 63.51%), when the share of government shares exceeds the upper level will start to increase bad debts; (2) bank size is negatively related to the bad debt ratio; (3) diversifying revenue sources can significantly reduce the ratio of bad debts; (4) NPL ratio increased steadily from 1996 to 1999; and (5) banks established after deregulation, on average, have lower NPL ratios than banks established before deregulation.

Khemraj and Pasha (2009) studied the determinants of NPL ratios for banks in Guyana, research conducted on Guyana commercial banks in the period 1994 - 2004 using FEM model to show factors affecting bad debt. The two authors have pointed out that the real exchange rate has a positive effect on bad debts, meaning that when the local currency appreciates, the portfolio of commercial banks may be higher. Meanwhile, GDP growth has a negative relationship with bad debts, which shows that improving the economy will reduce the bad debt ratio.

Misra and Dhal (2010): based on a sample of 27 banks in India from 1996 to 2008, they conducted a periodic analysis of the banking indicators, focusing on bad debts of banks. Indian public sector goods. Empirical analysis proves that interest rates, bank size, bad debts of the previous year were positively affected with bad debts. The loan term is opposite to the bad debt, the reason explained by the author is that the parties believe in each other more, so they can lend for a long time, leading to less bad debt. The ratio of 19 credits to mobilized capital is higher than the industry average, which will increase bad debt.

Louzis et al. (2011) conducted research on the factors affecting NPLs of the Greek banking system through 9 largest banks of Greece in the period from Q1 2003 to Q3 2009. The impact of macro and internal factors on the bank's bad debt. From studying the data collected by the GMM estimation method, the author shows that the GDP growth rate is negatively correlated with the bad debt ratio, while the unemployment rate and real interest rate RIR has a positive correlation with bad debt ratio. In addition, empirical results indicate that the quantitative effects of various NPL determinants vary depending on the type of loan. In particular, consumer lending is most sensitive to changes in lending rates, business loans fluctuate much with real GDP growth, while mortgages are least affected by the macroeconomic development. From the results, the authors provide some policy and regulatory implications. In particular, there is evidence that ineffective implementation measures may be the leading cause of problem loans in the future. This suggests that regulators should focus on management performance to detect banks with increased NPL ratios. Furthermore, regulators should focus on the relevant risk management systems and processes to avoid future financial instability.

Makri et al. (2014) studied the factors affecting bad debts of 17 European countries in the period of 2000-2008. The study identified a negative relationship between the ratio of bad debts to GDP growth, ROE and credit risk provision; positive relationship with unemployment rate, previous year bad debt and public debt. The negative correlation between public debt and bad debt is explained by the problematic fiscal policies of the countries that lead to an increase in bank bad debts.

Ekanayake (2015) conducted a study on the determinants of NPLs in Sri Lanka commercial banks on the data set of 9 commercial banks in Sri Lanka from 1999 to 2012. The study shows that NPLs are due to the impact of both macro factors and specific factors within the bank. Two indicators, the loan-to-asset ratio and loan loss ratios used to measure banks' exposure, show a positive correlation with non-performing loans. Contrary to expectations, high credit growth is negatively correlated with bad debt. This inverse relationship indicates that banks that are more active in the credit market are less likely to suffer from bad debt. In addition, the bank's business performance and size have the opposite effect on bad debts. Among the macro factors, GDP and inflation have the opposite effect of 21 to non-performing loans (according to this study, in the situation of high inflation, the bad debt ratio is lower than other times) and interest rates. Lending has the same effect as bad debt. Nguyen Thi Hong Vinh (2015), the author studies the factors affecting bad debts of Vietnamese commercial banks, research sample: 22 Vietnamese commercial banks in the 2007-2014 period. Experimental results show the specific factors effecting bad debts such as bank efficiency, equity, credit growth are the main factors that have the opposite effect on the bad debts of the Vietnamese commercial banking system. Meanwhile, bad debt in the past, bank size, outstanding loans on mobilized capital have positively impacted on bad debts. Macro factors such as economic growth, inflation rates, interest rates, exchange rates, real estate prices also have a significant impact on bad debt.

In the world, there have been many studies on the factors affecting bad debts of commercial banks. Specifically, Fofack (2005) analyzes causality based on dynamic table data using GMM method to find out the factors that cause bad debt in Sahara countries. The results of the study show that real interest rate, GDP growth rate, inflation index, total assets income (ROA), and marginal interest income (NIM) affect bad debt.

Argaw (2016) studies the factors affecting bad debt: cases at commercial banks of Ethiopia. The author used the mixed research that was applied to carry out this study. Secondary time series data are collected from audited annual reports and bank performance reports; and the required ratios have been calculated. In addition, 12 credit experts from related departments and functional departments responsible for lending issues in the bank were interviewed. The results obtained from the regression output indicate that of the variables studied, the loan / deposit ratio; Financial performance is measured on return on equity; and capital adequacy is determined to be a statistically significant determinant of bad debt. On the other hand, loan growth, cost effectiveness and bank size are not statistically significant in affecting bad debt. The results from the interview show that the variables such as credit risk assessment are poor, focusing on lending based on collateral, poor loan monitoring, and debt handling skills of banks, poor lending products, short loan periods and lack of credit advisory practices are also specific factors affecting bad debt. Research shows that focusing on these bad debt ratios can further reduce the likelihood of defaulting while expanding credit in the future. Further studies are recommended by including macroeconomic and other bank-specific variables and increasing sampling time.

Do Quynh Anh and Nguyen Duc Hung (2013) studied the factors affecting the bad debt of Vietnamese commercial banks in the period 2005–2011. The research results show that inflation and GDP growth have an impact on bad debt and bad debt affects bad debt of the following year and bank size has a positive relationship with bad debt. Nguyen Thi Hong Vinh (2015) conducted a study on the factors affecting bad debts of Vietnamese commercial banks in the period of 2007–2014, the study results showed that both specific and macro factors have an impact to bad debts of Vietnam commercial banking system. In which profitability and economic growth are the main factors that negatively impact on NPLs, NPLs in the past, bank size, credit growth have a positive effect with NPLs, only evidence of equity and inflation have a significant impact on the bad debt ratio of commercial banks.

Nguyen Duy Tung and Dang Thi Bach Van (2015) analyze the impact of intrinsic factors on bad debts of Vietnamese commercial banks by the data of table and analysis method in the period of 2004-2014. Research

results show that bad debts of Vietnamese commercial banks are affected by internal factors such as quality of governance, moral hazard, and there is no evidence to show that diversification of operations can reduce NPL ratio.

From studies in the world and in Vietnam, the author found that there have been many studies on bad debts and factors affecting bad debts in banks. Each study has produced different results and relationships between the factors and bad debt. Most studies have used macro and micro factors to examine the influence of these factors on the bad debts of commercial banks. In the context and scope of the study, the author finds that depending on the characteristics of each bank, each country, the research model will have different factors affecting the bad debt and the correlation among variables to bad debt.

3. Research methods and research models

3.1. Research model and research hypotheses

3.1.1. General model

$$Y_{it} = \alpha + \beta_k X_{kit} + u_{it}$$

In which:

Y_{it} The value of the dependent variable corresponding to the business i at time t .

X_{kit} The value of the independent variable k represents the factors that affect the dependent variable of firm i at time t .

u_{it} The random error of business i at time t .

3.1.2. Research hypotheses

Hypothesis H1: Profitability (ROA) negatively impacts on NPLs

Some financial indicators show the profitability of the bank used in previous studies such as: ROA - profitability over total assets, the author uses ROA as the index representing bank profit because this index shows the ability to create bank profits on the overall capital source, regardless of which capital source that has a more comprehensive view. Besides, based on ROA, it is possible to compare the performance of banks with the same risk level, because this index eliminates the difference in tax policy as well as the financial leverage that the bank is using (Kupiec & Lee, 2012), as well as Messai and Jouini (2013).

Hypothesis H2: The rate of credit growth (CRE) has a positive effect on bad debt

Fast credit growth is often associated with low credit quality due to loosening loan conditions. This index is used to compare the growth of outstanding loans over the years, to assess the bank's lending situation. The competition in the lending market makes banks racing for credit growth and high credit growth which often lead to economy crisis, banks are at risk of bad loans. Keeton (1999) studied the impact of credit growth on overdue debt in the United States from 1982 to 1996. The study showed a close relationship between credit growth and bad debt, credit growth is associated with lower credit standards, contributing to higher NPLs in some states in the United States. As the same result, Salas and Saurina (2002), through a study of NPLs of Spanish banks between 1985 - 1997, showed that credit growth was significantly positively associated with non-performing loans.

Hypothesis H3: Provision for credit losses (LLR) has a positive effect on non-performing loans

To ensure safety in credit operations of commercial banks, international accounting standards stipulate the following specific measurement indicators: (i) Measuring liquidity by the ratio of loans / mobilized capital; (ii) Measuring capital adequacy by equity / total risk weighted assets (CAR) and (iii) Measuring the ability to offset loan losses: Proportion of risk provision / total debt. When commercial banks incur bad debts, to ensure safety in credit activities, managers must increase costs related to managing bad debts while accounting for high-risk assets. This makes the risk provisioning ratio to total outstanding loans increase when bad debt increases. Messai and Jouini (2013) reported that non-performing loans (NPLs) had a positive impact on the provision for credit

losses. However, in the opposite direction, through empirical research on the factors affecting bad debts of 17 European countries in the period of 2000-2008, Makri et al. (2014) showed that provision for credit losses had a negative impact on bad debt.

Hypothesis H4: The ratio of equity to total assets (ETA) has a positive effect on bad debt

The ratio of equity to total assets shows the sufficient capital status as well as the safety and health of a bank. This low ratio proves that the bank uses high financial leverage, which contains a lot of risks and can make bank profits lower when loan costs are high. Nguyen Thi Hong Vinh (2015) uses three estimation models: FEM, GMM and the systematic GMM to study the topic: Factors affecting NPLs in commercial banks during 2007-2014. By GMM system, the results showed that equity had an opposite effect on the bad debt ratio. In the opposite direction, Shrieves and Dahl (1991) through empirical research of nearly 1800 banks in the US from 1984 to 1986, the two authors concluded that the ratio of equity to total assets had positive relationship with bad debt. The above correlation is explained by the fact that banks are subject to the government's control mechanism on the ratio of capital and the allowed level of risk, so usually the higher the capital rate, the higher the allowed risk. Another reason to mention that the high ratio of equity to total assets proves that the bank is using low leverage, but the use of low leverage equals less risk and will not be able to achieve the desired returns. Therefore, to achieve the desired profits, banks tend to increase leverage, access to more risky sources of loans, leading to bad debt ratios higher. Another basis for explaining the positive relationship mentioned by the author is that when the bank receives high risk investment, it will want to increase the capital ratio to reduce bankruptcy costs. Therefore, when taking high risks to increase the bankruptcy fee, the bank wants to increase the capital ratio to reduce this expense. In addition, the motivation of the bank's management is that not want the bank to go bankrupt, the risk level is lower than that of the shareholders, so when the bank is at high risk, the management will want to increase the capital ratio.

Hypothesis H5: Bank size (SIZE) has a positive effect on bad debt

Total assets will represent the size of that bank. According to the regulations of the State Bank, when the size of commercial banks increases, banks must increase equity. Therefore, the increase in total assets will increase the ability of commercial banks to provide credit. On the other hand, large scale commercial banks will have a strict credit process and customers are often large, reputable and stable enterprises, so this debt asset management is usually better than small commercial banks. Thus, the size of a commercial bank can positively or negatively affect the NPL ratio, depending on the choice of asset structure and the bank's ability to manage assets. According to the 'scale effect' hypothesis, Salas and Saurina (2002) suggest that large-scale banks allow more diversification opportunities, the author provides empirical evidence showing that the size of bank is bigger, the bad debt ratio is bigger. Contrary to the above hypothesis, the "too large for bankruptcy" hypothesis that large banks accept excessive risk by increasing the use of loan capital so there is more bad debt. Through empirical evidences on 27 banks in India from 1996 to 2008, Misra and Dhal (2010) have shown that bank size has a positive impact on bad debt. This same relationship is also explained by small banks have higher management efficiency leading to better loan approval and better loan management, resulting in lower NPLs.

Hypothesis H6: Economic growth (GDP) has the opposite effect on bad debts

The relationship between GDP and bank bad debt is considered in specific conditions of the economy. Louzis et al. (2011) explained that when the economic crisis occurred, the financial situation of companies, business households and individuals in the economy were in difficulty, thus increasing the bad debt ratio. On the contrary, when the economy is growing strongly, the bad debt ratio is reduced due to the improvement of income of companies and households. Salas and Saurina (2002) show a significant negative effect of GDP growth on NPLs and infer the rapid spread of macroeconomic factors to the ability of economic actors to lend. Khemraj and Pasha (2009) used table data and FEM model to conduct research on factors affecting NPLs of Guyana's commercial banks between 1994 and 2004. The two authors also has same result as previous studies, GDP growth has a significant negative relationship with non-performing loans.

Hypothesis H7: Unemployment rate (UER) has a positive effect on bad debt

Unemployment rate is a direct impact on individual credit channels of commercial banks. It is easy to realize when the rising unemployment rate means the number of unemployed people increases, fewer jobs lead to lower

income of workers. This affects the ability to repay loans at commercial banks, leading to high probability of credit risk and high risk of bad debts, especially in consumer loans. According to Louzis et al. (2011) conducted research on factors affecting NPLs of the Greek banking system through 9 largest Greek banks in the first quarter of 2003 to the third quarter of 2009. The study showed the impact of macro factors and banking characteristics on bad debt. From studying the data collected by the GMM estimation method, the author showed that the GDP growth rate was negatively correlated with the bad debt ratio, while the unemployment rate and real interest rate RIR had a positive correlation with bad debt ratio.

Table 1: Description of variables in the model

	Variables	Symbol	Measure	Expected sign
	Dependent variable			
1	NPL ratio	NPN_{it}	$\frac{NPL_{it}}{\text{Total loan}_{it}}$	
	Independent variable			
2	Profitability	ROA_{it}	$\frac{\text{Profit after tax}_{it}}{\text{Total asset}_{it}}$	-
3	Credit growth rate	CRE_{it}	$\frac{\text{Loan}_{it} - \text{Loan}_{i,(t-1)}}{\text{Loan}_{i,(t-1)}}$	+
4	Provision for credit risk	LLR_{it}	$\frac{\text{Provision for credit risk}_{it}}{\text{Total loan}_{it}}$	+
5	Equity ratio to total assets	ETA_{it}	$\frac{\text{Equity}_{it}}{\text{Total Asset}_{it}}$	+
6	Size	$SIZE_{it}$	Logarit ₁₀ (Total Asset)	+
7	Economic growth	GDP_t	Collect data source of WB, IMF	-
8	Unemployment rate	UER_t	Unemployment rate _t	+
9	Real interest rates	RIR_t	Real interest rate _t	+

Source: Summary of the author

3.1.3. Research data

The data study was from 2012 to 2018 with the assumption to ignore the impact of the global financial crisis. The results from quantitative analysis in the modeling of the main factors affecting NPLs in Vietnamese commercial banks with the observed samples are commercial banks including 16 joint stock commercial banks in Vietnam as a basis for comparison, analyze, collect data and information. The data is represented by table data, financial data is collected from financial statements and annual reports, macro data is taken from the database of the General Statistics Office, the report of State Bank and World Bank.

3.1.4. Estimation method

Pooled OLS model is a model that does not control each individual characteristics of each research object. Linear estimation is an estimate using the least squares method (OLS) on the data set of time objects, so this estimate considers all coefficients to be constant between objects and does not change over time. Accordingly, the use of table data has two major advantages such as: i) Table data gives the results of the estimation of parameters in a more reliable model; ii) Table data allows us to identify and measure impacts that cannot be identified and measured using cross and time data. However, the study data is panel data and there is the presence of the lag variable of the dependent variable which is bad debt of the previous year, the estimation of OLS and other methods will be skewed and unstable, so the author will use the GMM method to handle the existence of lag variables.

GMM was first presented by Lars Peter Hansen in 1982 in the article "Large Sample Properties of Generalized Methods of Moments Estimators". Overall, GMM is the general method of many popular estimation methods such as OLS, MLE, FE, RE, GLS, IV, 2SLS Even in the context of endogenous assumptions violated, the

GMM method produces robust, non-biased and efficient estimates. It can be said that OLS or Maximum Likelihood ... is just a special type of GMM equation because GMM works with very few assumptions and many researchers think that GMM is most effective for experimental financial researchers (Nguyen Doan Man, 2016). Therefore, the author will use the GMM method to overcome endogeneity in the presence of tool variables. The tests in the model involve multicollinearity, autocorrelation, variance change and endogenous phenomena. The study will perform tests to ensure the model has no deviations and the efficient estimate.

4. Research model results and discussion

4.1 Model estimation results

Table 2 presents descriptive statistical results of the variables. The average value of the bad debt ratio is 0.033; minimum value is 0.01 and maximum value is approximately 0.6. Profitability on equity has average value, minimum value and maximum value respectively: 1.7%; 0.1% and 2.6% respectively. Credit growth rate ranges from 10.32 to 15.11 and the average value reached 14.25. Provisions for credit losses -0.04 to 0.16 with an average of 0.07. The ratio of equity to total assets is from 0.04 to 0.18, the average value is 0.07. Bank size varies from 13 to 15 with an average of 14. GDP ranges from 0.054 to 0.070 with an average of 0.063. The unemployment rate ranges from 0.0215 to 0.0233 and the average is 0.0219. The real interest rates have average value, minimum value and maximum value: 0.05; 0.028 and 0.073 respectively.

Table 2: Statistics describe variables related to the sample

	<i>Variables</i>	<i>Number of observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
1	<i>NPL</i>	112	0,0339304	0,0109194	0,0163368	0,0691208
2	<i>ROA</i>	112	0,017745	0,0052655	0,001346	0,0263997
3	<i>CRE</i>	112	14,25793	0,4327835	10,32984	15,11828
4	<i>LLR</i>	112	0,0792591	0,0242286	-0,0406177	0,1626305
5	<i>ETA</i>	112	0,079952	0,1728178	0,046283	0,182034
6	<i>SIZE</i>	112	14,25793	0,4327835	13,32984	15,11828
7	<i>GDP</i>	112	0,0636395	0,005601	0,0542188	0,0707579
8	<i>UER</i>	112	0,0219167	0,0011497	0,0215489	0,0233137
9	<i>RIR</i>	112	0,0502731	0,0140425	0,0286467	0,0732226

Source: Results from Stata software

Correlation coefficient matrix (Correlation) in Table 3 shows the correlation coefficient between variables in the regression model. The correlation coefficients are smaller than 0.8, so the research model has no multi-collinear phenomena.

Table 3: Correlation coefficient matrix

	<i>NPL</i>	<i>ROA</i>	<i>CRE</i>	<i>LLR</i>	<i>ETA</i>	<i>SIZE</i>	<i>GDP</i>	<i>UER</i>	<i>RIR</i>
<i>NPL</i>	1								
<i>ROA</i>	0,181	1							
<i>CRE</i>	-0,631	-0,284	1						
<i>LLR</i>	0,018	-0,005	0,067	1					
<i>ETA</i>	0,283	0,242	-0,561	-0,010	1				
<i>SIZE</i>	0,218	-0,024	-0,381	-0,131	0,323	1			
<i>GDP</i>	-0,379	0,196	0,243	-0,225	-0,156	0,106	1		
<i>UER</i>	-0,034	-0,232	-0,045	-0,067	0,219	0,042	-0,109	1	
<i>RIR</i>	0,021	-0,202	-0,126	0,159	0,16	-0,006	-0,233	0,269	1

Source: Results from Stata software

The results of Table 3 show that the correlation coefficients between the independent variables in the research model are low (absolute value <0.5) so the selection of these independent variables to study is perfectly appropriate. The GMM method is used to estimate the presence of the lag variable (which is the one-year delay of bad debt).

Table 4: Regression model by GMM method

NPL	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
ROA	-0,737715	0,030	4,360	0,000	0,073	0,193
CRE	0,0010972	0,001	-3,860	0,531	-0,004	-0,001
LLR	0,2634946	0,057	0,140	0,000	-0,104	0,120
ETA	0,1496335	0,006	4,460	0,000	0,014	0,037
SIZE	0,0044441	0,004	0,950	0,340	-0,004	0,010
GDP	-0,656748	0,018	2,930	0,003	0,018	0,089
UER	-0,498941	0,263	2,940	0,150	0,259	1,292
RIR	-0,104148	0,075	-0,650	0,765	-0,763	0,654
Lnplr	-0,013	0,061	-0,210	0,831	-0,133	0,106
_cons	0,033	0,030	1,090	0,275	-0,026	0,093

Source: Results from Stata software

The estimated results by the GMM regression model showed that the independent variables with Prob value <0.1 are statistically significant. In the regression model, there are 4 statistically significant variables: profitability (ROA) negatively impact the ratio of bad debt, equity to total assets (ETA) impact the non-performing loan ratio, provisions for credit losses (LLR) is positively impacted with the bad debt ratio and the economic growth rate (GDP) has the opposite effect with the bad debt ratio. From the estimation results, the regression model measures the impact of factors on bad debts of commercial banks on Vietnam's stock market as follows:

$$NPL = 0.339864 - 0.737715 ROA + 0.2634946 LLR + 0.1496335 EAT - 0.656748 GDP$$

4.2 Discuss the results

Return on assets (ROA)

According to research results, ROA has a negative impact on bad debt. This result coincides with the original expectations of the author as well as the research results of Messai and Jouini (2013). The results show that when the bank has good business results, it shows that the bank has good business management ability, good quality control of credits leading to a decrease in the ratio of bad debts. This could be explained as follows: the more profitable banks are less motivated to engage in risky activities because they are less pressured by making profits. At the same time, the more profitable banks will have the opportunity to select customers with good financial ability and low risk. Therefore, as banks' profits increase, the probability that bank executives engage in risky investment projects will decrease and thus the probability that bank loans turn to bad debt will also decrease accordingly.

Provision for credit losses (LLR) The ratio of LLR has a positive correlation with the ratio of bad debts in the same period. This result coincides with the original expectation of the author as well as the results of Boudriga et al (2009). A positive correlation shows that when the bank has a high provision rate, the bad debt ratio is high. This result is explained by the high provision which shows that the bank has not high professional qualifications of staff, supervision of commercial banks in credit provision and debt management is not good, so the bad debt ratio is high.

Equity (EAT) The ratio of equity to total assets impacts in the same direction of non-performing loans. The ratio of equity to total assets shows the sufficient capital status as well as the safety and health of a bank. This low ratio proves that the bank uses high financial leverage, which contains a lot of risks and can make bank profits lower when loan costs are high. Therefore, in order to ensure the profit target, banks have to lend at a higher risk to increase the bad debt ratio. This result coincides with the study of Shrieves and Dahl (1991).

Economic growth (GDP) When the economy grows stably and sustainably, it will have positive effects on production, business and import-export activities of enterprises, thereby helping to generate profits and increase the ability to repay loans to commercial banks. At the same time, the author's research evidence has similar results with previous studies of the authors Louzis et al. (2011), Salas and Saurina (2002), Khemraj and Pasha (2009). The negative trend between GDP growth and non-performing loan ratio is evident in the remaining period from 2013-2015. In the context of the economy facing many difficulties, challenges and world economy instability, this is still a relatively good increase. Inflation is controlled by well-performing, synchronized credit and fiscal monetary solutions as well as flexible coordination mechanisms between fiscal and monetary policies. In the monetary market, interest rates are flexibly operated, basically in line with macroeconomic and monetary developments, especially inflation in each period. Specific macroeconomic policies have helped the economy to stabilize growth, paving the way for profitable businesses and increasing the ability to repay loans of commercial banks, thus reducing bad debt risk.

Conclusions and recommendations

Firstly, improve profits and profitability: Diversify investment channels to increase revenue for banks. Improve the quality of products and services, diversify non-credit products that can be traded by electronic means on the network environment with high safety and security features in order to save transaction costs at the counter. Publicizing on the website the procedures of providing services to customers, improving service processes to reduce costs, shorten the time of providing services to customers. Continuously review the determination of fees for each type of service, and eliminate unreasonable fees. Strengthen inspection and monitoring of service quality through secret customer to improve service quality. Strengthen strict control over operating expenses of the bank in order to reduce the ratio of operating expenses to net operating income. In particular, building human resources in accordance with the operating scale of each business unit to promote maximum multi-labor productivity of employees.

Secondly, the common goal is to develop business operations, the commercial banks on the stock market of Vietnam need to consider credit growth carefully and sustainably coupled with improving credit quality, increasing the rate of guaranteed loans with assets production. Particularly, outstanding debts has been dealt with by risk provisions, it is necessary to actively seek all measures to recover. Improving the portfolio, give priority to expand lending to small and medium enterprises; non-state enterprises; gradually reduce the proportion of loans to businesses that are underperforming. Continue to diversify components customers in the direction of increasing the proportion of customers with collaterals, especially for customers belonging to non-state economic sectors and retail loans. Open to loans to customers who are doing business in key economic sectors, trading goods with stable consumption market; Prudent lending to goods that there are many fluctuations in the market price. To prevent high NPLs in the future, banks need to have a strict supervision and management system on credit activities to minimize the risks in providing loans and the macroeconomic policies.

Thirdly, the bank's equity can be used to offset the temporary payment shortage, to prevent operational risks. It can be said that the size of Vietnamese banks is smaller than banks in regional countries like China, Malaysia, India, Thailand and Indonesia. As a result, Vietnamese banks are under increasing capital pressure to ensure operational safety indicators. It can be seen that the increasing capital is an essential element to improve competitiveness in the current financial market context. In developed countries, Basel IV treaty is being launched. However, in major developing countries, including Vietnam, Basel III standards are being applied. One of the criteria mentioned in the Basel III standard is CAR. Therefore, banks are struggling to raise capital. This means that joint stock commercial banks on the stock market of Vietnam must simultaneously increase the

equity (in order to achieve the minimum capital adequacy ratio as prescribed in Circular 41) and increase mobilized capital.

Fourthly, proposing Government maintains the stable GDP growth, proactively and flexibly manage monetary policy instruments, coordinate closely and synchronously with fiscal policy. At the same time, focusing on removing difficulties for production and business, developing markets, increasing purchasing power, promoting commodity consumption. It is necessary to increase the priority of credit capital to promote production and business effectively for small and medium-sized enterprises. Supporting to boost export sector: Promoting trade promotion and developing export markets. In addition, the government needs appropriate solutions to mobilize public investment capital for the construction of a comprehensive infrastructure system - one of three breakthroughs identified in the socio-economic development strategy. Organize the implementation of public investment plans, strengthen inspection and examination to ensure the use of this capital source for the right purposes, in an efficient, economical and anti-wasteful manner.

Fifthly, during the period of economic growth decline, falling inflation will promote an increase in bad debt. Thus, in these periods, bank managers need to pay more attention to measures to control bad debts. In order to do well this task, the author recommends that administrators enhance monitoring of macroeconomic indicators, inflation, unemployment in the General Statistics Office reports, the average lending rate at the state bank; especially in the forecast reports on the situation of economies in IMF and World bank, thereby developing appropriate macroeconomic forecasting methods.

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