
**FACTORS AFFECTING CREDIT RISK TO INDIVIDUAL CUSTOMERS AT THE
JOINT STOCK COMMERCIAL BANK FOR INVESTMENT AND DEVELOPMENT OF
VIETNAM DONG THAP BRANCH**

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ABSTRACT: *Research on factors affecting credit risk for individual customers at Dong Thap BIDV was conducted by interviewing 130 individual customers who were borrowing money at Dong Thap BIDV through prepared questionnaires. The study uses methods such as descriptive statistics, absolute and relative number comparison, probit regression model to solve the research objectives. Research results show that there are 04 independent variables with a linear correlation with the dependent variable, including debt guarantee; The main industry generates income to pay off debt; Experience of credit officers; Number of dependents. From the research results, the authors propose a number of solutions to limit the credit risks of individual customers at Dong Thap BIDV in the next time.*

KEYWORDS: BIDV Dong Thap, credit risk, individual customers, factor analysis.

INTRODUCTION

Identifying the factors that affect personal credit risks for the bank to have a strategy to prevent and limit credit risk is a difficult and complicated problem because credit risks are often difficult to control and lead to many losses, losses in capital and income of the bank. During the past time, the bad debt situation was announced by the end of 2019, credit increased by about 13% compared to the end of 2018; on-balance sheet NPL ratio is 1.89% (D.A, 2019). Thus, although the bad debt problems have been resolved in a large number, with this number, banks still have to plan for risk prevention and risk management in credit granting activities of credit institutions in Vietnam. On the other hand, personal credit risk is considered the top concern of commercial banks. In addition, credit risk management holds a central position in the bank's risk management and risk management is the best way that all credit institutions need to implement. If personal credit risk prevention and mitigation is done well, it will bring practical benefits to the bank. Recognizing the importance of personal credit risk management of the bank, the authors chose the topic "Factors affecting credit risk for individual customers at Investment Commercial Joint Stock Bank and Dong Thap Vietnam Development "Branch" is the research topic.

LITERATURE REVIEW

The borrower's financial capacity (X1)

Research results of Phan Dinh Khoi and Nguyen Viet Thanh (2017) show that the borrower's

financial capacity is measured by the ratio of the client's equity in the project to the total investment of the balance loan judgment. Therefore, in this study the authors expect that the greater the equity capital of the borrower participating in the loan project, in addition to the low cost to pay for the loan, they will also invest time and with more interest in the project, the more likely it is that the project will be successful and thus lower risk, or the borrower's financial capacity is inversely related to credit risk.

Hypothesis H1: The borrower's financial capacity has a negative impact on the credit risk of individual customers.

Debt guarantee (X2)

According to Truong Dong Loc and Nguyen Thi Tuyet (2011), loan security is the solvency of secured loans rather than unsecured loans. Collateral is measured by the Loan Amount / Collateral Value. Collateral is also a very important component for a loan, it is the second source of repayment if an individual's loan has problems, the higher the collateral value, the ability to repay the bank higher. In this study, the authors expect that the higher the ratio of the loan to the collateral value, the higher the risk of the loan, which means that the ratio of loan to collateral value is relevant, proportional system with credit risk.

Hypothesis H2: Ensuring that the borrower's loan has a positive impact on the credit risk of individual customers.

The main industry generates income to pay off debt (X3)

Research results of Le Khuong Ninh and Lam Thi Bich Ngoc (2012) show that the Mekong Delta in recent years, the aquaculture and agriculture sectors are not favorable and have many risks. The ability to generate income from this sector to repay loans on time is very difficult. Therefore, the authors expect, the aquaculture and agricultural production sectors are positively related to credit risk.

Hypothesis H3: The main industry that generates income for debt repayment has negative effects on the credit risk of individual customers.

Checking and monitoring debt (X4)

Research results of Truong Dong Loc and Nguyen Thi Tuyet (2011) showed that one of the causes of credit risk is not tight inspection and supervision after lending. Credit officers who regularly check and supervise a loan will promptly grasp information about individual customers, promptly recover the loan if there is any sign of risks and expect that if the number of checks is more, The

lower the credit risk or the monitoring and monitoring factor is inversely proportional to the credit risk.

Hypothesis H4: Loan inspection and supervision have negative impacts on credit risk of individual customers.

Experience of credit officers (X5)

Research results of Le Khuong Ninh and Lam Thi Bich Ngoc (2012) show that the qualifications and experience of credit officers have a great influence on credit risk. A qualified officer can not only analyze well the customer's financial ability, forecast the situation, but also advise customers to overcome temporary difficulties. The qualifications and experience of credit officers affect the credit risk. In this study, the authors expect that the longer the credit officer has, the more experienced and qualified in loan appraisal, management as well as customer support in difficult times, or the experience of Credit officers are inversely proportional to credit risk.

Hypothesis H5: The experience of credit officers has a negative impact on the credit risk of individual customers.

Borrower's experience (X6)

Research results of Truong Dong Loc (2010) show that governance capacity and experience of borrowers are important factors for successful or unsuccessful implementation of loan projects. Experienced people will be better able to forecast the situation as well as respond to uncertainties that happen in a better way. In this study, the authors expect that the longer those who have worked in a certain industry, the higher the likelihood of success, or that the borrower's experience is inversely proportional to the credit risk.

Hypothesis H6: Borrower's experience has a negative impact on the credit risk of individual customers.

Loan value (X7)

Research by Truong Dong Loc (2010) shows that the higher the loan amount, the lower the management cost than small loans, but the larger the loan amount, the higher the risk, because the loan value is large, the monthly payment will increase the risk of repayment. In this study, the authors expect this variable inversely proportional to the dependent variable. Hypothesis H7: The value of the loan has a positive impact on the credit risk of individual customers.

Number of dependents (X8)

Research results of Truong Dong Loc (2010) show that the more dependents that do not generate income, the higher the risk level. The number of dependents adds a cost burden to the borrower,

resulting in an impact on the ability to repay the loan and, as a result, high credit risk In this study, the authors expect this variable to be inverse with the dependent variable

Hypothesis H8: Number of dependents has a positive impact on the credit risk of individual customers.

Age (X9)

Research results of Truong Dong Loc (2010) show that, depending on the age, the level of credit risk varies. As the age increases, the prestige and trustworthiness will be higher than that of the young, so the younger the age, the higher the credit risk with the dependent variable.

Hypothesis H9: Age has a negative impact on the credit risk of individual customers.

Based on the theoretical background and previous research results, and on the characteristics of individual customers at Dong Thap BIDV, the authors propose the following research model

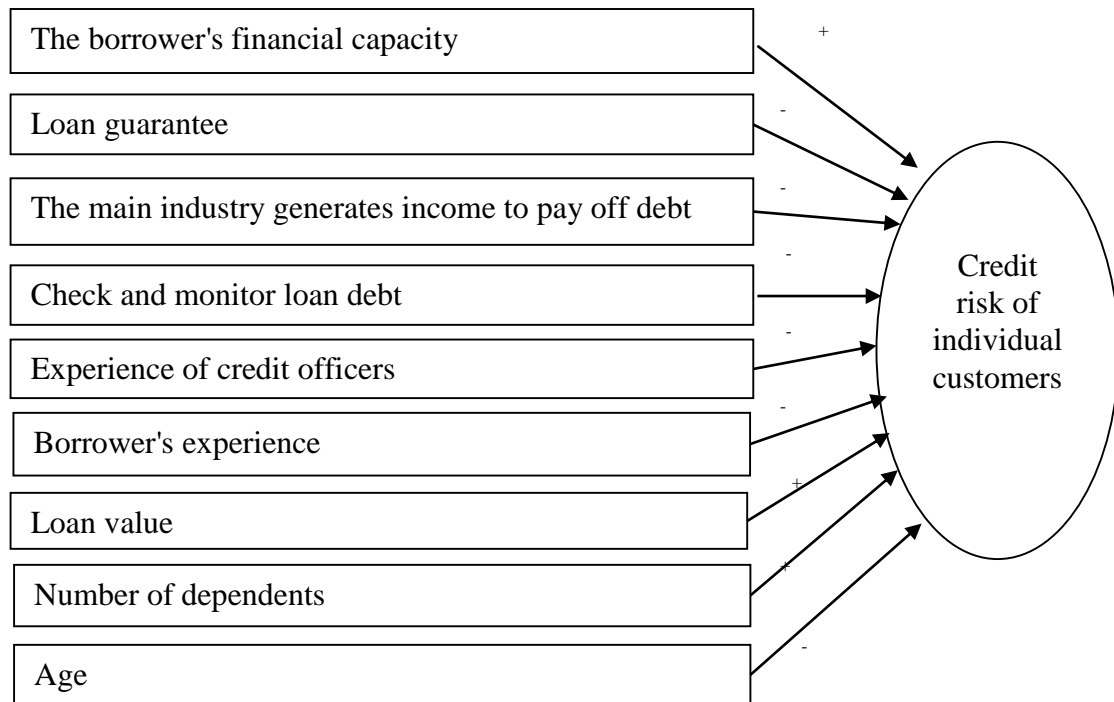


Figure 1. Research model of factors influencing the credit risk of individual customers at Dong Thap BIDV.

Source: The authors synthesize and propose from relevant studies, 2020

RESEARCH METHODS

Research is conducted through two main steps: qualitative research and quantitative research. Qualitative research was conducted by group discussion, in-depth interviews with officials in charge of the loan department and customers who have been and are loaning at Dong Thap BIDV. The purpose of discussion and in-depth interviews with experts is to help eliminate indicators of ambiguity, duplication of content, and add appropriate words to accurately reflect the content of

the research problem. Results of qualitative research, fully defined scales include 09 independent variables and 01 dependent variable is considered influencing credit risk of individual customers at Dong Thap BIDV.

RESEARCH RESULT

Overview of individual customers

Personal credit products Personal credit products at the Vietnam Joint Stock Commercial Bank for Investment and Development - Dong Thap branch are diversified in service types. Each customer who comes to borrow at the transaction offices has different capital use purposes, so the demand for capital is also different.

Table 1 of current status of personal credit products at BIDV - Dong Thap branch

| Loan products | Frequency | Rate (%) |
|---|------------|------------|
| 1. Mid and long-term loans to buy houses | 10 | 7,69 |
| 2. Short-term loans according to production and business limits | 24 | 18,46 |
| 3. Short-term mortgage loan | 21 | 16,15 |
| 4. Short-term loans according to production and business items | 35 | 26,92 |
| 5. Lending for medium-term consumption without special assets | 10 | 7,69 |
| 6. Lending for medium-term consumption secured by real estate | 11 | 8,46 |
| 7. Loan for mid-term production and business | 19 | 14,62 |
| Tổng | 130 | 100 |

Source: Results of author's information collection, 2020

Through a survey of 130 individual customers, it shows that customers focus on loan products such as short-term mortgage loans, short-term loans according to production and business limits, short-term loans according to production and business items. In which, short-term loans by business items accounted for the highest rate of 26.92% and followed by short-term loans according to production and business limits at 18.46% and short-term mortgage loans by items accounting for 16.15%. The reason that customers focus on these types of loans is flexible loan terms with low interest rates to serve the purposes or needs of customers who want to borrow in the short term because the procedure is quick and takes less time. Based on a specific business plan, the bank will meet the borrowing needs associated with the loan purpose to ensure that the loan is used for the right purpose and a feasible business plan. This form of loan is suitable for customers who have loan needs based on seasonal use of capital. For short-term loans under the production and business limit, the maximum loan term is 1 year and the maximum loan amount is 100% compared to the maximum rate prescribed by the credit extension of the bank and does not

exceed the rate value of collateral is regulated by a bank. Customers can easily take out loans in this form of loans because if the business production plan is feasible, the loan is for the right purpose and the collateral meets the loan standards, the bank will disburse early to the customer.

Loan term type

For individual customers at Joint Stock Commercial Bank for Investment and Development of Vietnam - Dong Thap Branch has only 2 types of terms, which are daily and monthly. In which, monthly term accounts for higher proportion than daily term (72.8%), number of customers with daily loan accounts for only 27.2%. The reason is that the loan is suitable for each different type of customer, suitable for the purpose of using capital of the customer and at the same time, reduce costs, improve efficiency for customers and the bank. Loan term shall be calculated from the following day on which the credit institution disburses to the customer until the end of the day when the customer has to pay off the debt and interest as agreed by both parties as stated in the loan contract.

Loan purpose of individual customers

The survey shows that the purpose of borrowing money to use in general business and other specialized business accounts for the highest percentage of 16.67%. Next is the loan purpose to build, repair and buy houses, accounting for 14% and the third is the rice trade with 12.67%. The purpose of consumer loans for trade of food and raw materials accounts for the lowest rate of 5.33%. The customer needs to prove the purpose of using his loan when the customer has a need to borrow and establish a credit relationship with the bank, the first thing that the credit officer contact and complete the profile is the request. What do customers answer about the purpose of borrowing money. After the bank accepts the loan, the bank credit officer continues to ask customers to present details of the loan purpose. Thus, it can be seen that the purpose of using loans in customers' borrowing needs is relatively important, it is considered a prerequisite for the borrower's loan proposal at the bank. On the basis of the purpose of capital use, the new bank considers and decides to lend the customer the right loan with the proposed purpose. Therefore, in order to ensure that customers use capital for the right purposes as originally, credit officers need to always supervise business operations as well as the use of loans of customers, if detecting customers.

Interest rates of loans

Dong Thap BIDV offers loans at quite preferential interest rates and has many promotions for individual customers, promoting consumer lending activities to develop.

Table 2 Interest rate and loan value of customers at Dong Thap BIDV

| Indicator | Observed | Average | Standard Deviation | Minimum Value | Great value |
|--------------------------|----------|---------|--------------------|---------------|-------------|
| Interest rate (%) | 130 | 0,09 | 0,02 | 0,06 | 0,12 |
| Loan value (million VND) | 130 | 288,71 | 345,97 | 20,00 | 1.700 |

Source: Author's calculation results, 2020

Table 2 shows that the loan value of customers ranges from 20 million VND to 1,700 million VND. Dong Thap BIDV has many loan product packages such as unsecured loans, overdraft loans, high loan limits so the number of customers to transact and choose loan package more and more. Currently, the general trend of banks is to increase the value of loans to create conditions for customers to borrow and use capital more efficiently. Through table 2 shows, the lending interest rate at Dong Thap BIDV has value from 0.6% -0.12% / month, the average is 0.09% / month. To meet individual customers' needs of owning houses, cars, business and production and solving capital needs. In 2018, Dong Thap BIDV continued to expand the scale for the second time the medium and long term credit package "Long-term cooperation" from VND 20,000 billion to VND 30,000 billion. Therefore, for customers who choose loan packages at Dong Thap BIDV also enjoys different preferential interest rates because the actual lending interest rate is applied by each branch of BIDV. When joining the credit package, individual customers at BIDV can flexibly choose different loan packages with a constant interest rate. Specifically, the interest rate is from 7% / year in the first 6 months from the time of the first disbursement or the interest rate from 7.5% / year in the first 12 months from the time of the first disbursement or interest interest rate from 8.1% / year in the first 18 months from the time of first disbursement or the interest rate from 8.5% /year in the first 24 months from the time of first disbursement. However, in the process of borrowing and using capital, both the bank and the customer have difficulties in repaying capital and returning it to the bank.

Overview of factors affecting credit risk

Table 3 Overview of factors affecting credit risk

| Variable | Unit | Average | Standard deviation | Minimum value | Maximum value |
|---------------------------|--------------|---------|--------------------|---------------|---------------|
| Age | Years | 43,75 | 11,38 | 25 | 68 |
| Number of Dependents | Persons | 1,59 | 1,29 | 0 | 5 |
| Loan value | Million Dong | 288,71 | 345,97 | 20 | 1.700 |
| Debt check | Times/year | 13,01 | 3,93 | 3 | 20 |
| Borrower experience | Times | 5,11 | 1,33 | 3 | 8 |
| Credit officer experience | Years | 7,25 | 3,47 | 2 | 16 |
| Financial ability | Times | 0,54 | 0,23 | 0,08 | 0,99 |
| Loan guarantee | Times | 4,04 | 2,73 | 1,3 | 11,1 |

Source: Author's calculation results, 2020

The results in Table 3 show that the individual customer age is from 25-68 years old and the average age is 43.75 years old. The majority of customers who transact at the bank are still very

young and the demand for loans is also very diverse for personal consumption or small business. In modern society, borrowers have their own family life with 2 main generations, so the number of dependents of clients is not high, many customers are still single, so there are no dependents. The highest is 5 people, mainly children and elderly parents who are unable to work, but overall the average number of dependents is 1.59 people is considered quite low. The high number of dependents will result in a higher cost burden than the low number of dependents, and the credit risk will be higher. The value of the loan also has an impact on the credit risk, the high value of the loan will lead to high interest payments and the borrower will have more cost pressure. The survey shows that the value of the loan ranges from 20-1,700 million VND. In order to ensure that disbursement loans are used for the right purposes, credit officers play an important role in checking borrowers' loans. In general, the average inspection level of credit officers is quite high 13.01 times, the lowest is 3 times / year and the maximum is 20 times / year. For individuals who show signs of being late in paying interest many times, credit officers will pay more attention. Borrower's experience will facilitate the completion of loan procedures as well as be considered for a higher loan rate. However, borrower experience is only measured at the relative level that determines the convenience of customers. Through the survey, the experience of borrowers ranges from 3-8 times. In addition, the credit officer's experience is also considered, if the credit officer is experienced, the ability to review loan application will be better and less error. The financial ability of the customer is considered important because the financial ability will help make the payback easier, the individual customer survey results show that the financial ability of individual customers The multiplier ranges from 0.08-0.99 times, meaning that the customer's equity compared to the total capital has the lowest level of 0.08 and the highest is 0.99. In addition, the loan guarantee at 1.3-11.1 is also considered quite high because the collateral of customers is always lower than the loan level, so the risk is quite high.

Analysis of factors affecting personal credit risk

Before regression analysis, the author conducted a correlation analysis. Through the correlation analysis results show that, the correlated factors for the dependent variable include Loan Guarantee; Career; Experience of credit officers; Number of dependents due to Sig value of the variables <0.05 (5%), the remaining variables have no correlation with the dependent variable. Estimated results from the regression model are presented in Table 4.

Table 4 Factors affecting personal credit risk at Dong Thap BIDV

| Independent variables | Hệ số hồi | Hệ số dy/dx | Độ lệch chuẩn | Giá trị z | Mức ý nghĩa |
|---|-----------|-------------|---------------|-----------|-------------|
| Constant | 0,83 | - | 1,69 | 0,49 | 0,63 |
| The borrower's financial capacity (X1) | 0,03 | 0,00 | 0,87 | 0,04 | 0,97 |
| Debt guarantee (X2) | -0,48 | -0,05 | 0,16 | -2,97 | 0,00 |
| Major industries that generate income to pay off debts (X3) | -2,28 | -0,35 | 0,47 | -4,83 | 0,00 |
| Checking and monitoring debt (X4) | 0,04 | 0,00 | 0,05 | 0,71 | 0,48 |
| Experience of credit officers (X5) | -0,35 | -0,04 | 0,09 | -3,72 | 0,00 |
| Borrower's experience (X6) | -0,17 | -0,02 | 0,15 | -1,12 | 0,26 |
| Loan value (X7) | 0,00 | -0,00 | 0,00 | -1,30 | 0,19 |
| Number of dependents (X8) | 0,48 | 0,04 | 0,24 | 2,03 | 0,04 |
| Age (X9) | 0,00 | -0,00 | 0,02 | -0,04 | 0,97 |
| Number of observations | | | | | 130 |
| LR value | | | | | 97,6 |
| Prob>Chi ² | | | | | 0,000 |
| Pseudo-R ² | | | | | 63,62 |

Source: Author's calculation results, 2020

Looking at table 4, the following results:

- The coefficient Pseudo-R² is the coefficient explaining the influence of the dependent variable, which is the ability of the customer to repay. The Pseudo-R² coefficient of the model is 63.62, which means that 63.62% of the dependent variables are explained by the independent variables in the model, the rest 36.38% are other factors put into research model or included but not reach statistical significance.

- Prob> Chi² = 0.000 <0.05 indicates that the model is consistent with the significance level of 5% and we reject the hypothesis Ho: all independent variables included in the model have no variables affecting The individual customer's ability to repay the loan means the factors in the model that affect the customer's ability to repay the loan. The results in Table 4 show that, 09 independent variables included in the research model, there are 04 variables correlated with the dependent variable, which is the variable of Loan Guarantee (X2); Industry (X3); Experience of the credit officer (X5); Number of dependents (X8). In which, the dependent variable is positively correlated with the dependent variable and the borrower's industry variable has the strongest impact on the dependent variable, followed by the debt guarantee variable.

Factors affecting personal credit risk at Dong Thap BIDV were analyzed with the significance of 5% as follows:

- The first factor affecting personal credit risk is the debt guarantee variable (X2), ($dy / dx = 0.05$). If the client's ability to secure the loan is higher, the more secure it is, the lower the credit risk. The analytical results show that if other factors remain unchanged, the customer who can increase the loan guarantee by 1 times, the credit risk will decrease by 0.05 times. In accordance with expected results and in accordance with previous research by Truong Dong Loc and Nguyen Thi Tuyet (2011).

- The second factor affecting personal credit risk is the main industry that generates income for debt repayment (X3). If the client's industry whose main source of income for debt repayment comes from aquaculture and agricultural production, the credit risk will decrease and from other industries the credit risk will increase. With a significant level of 5% ($dy / dx = 0.35$), if the customer whose main source of income from fisheries and agricultural production increases by 1 million, the likelihood of credit risk will decrease by 0, 35 times. The survey shows that, in Dong Thap, individual customers mainly earn income from fisheries resources and agricultural production, so this also brings advantages for customers if their main source of income is from this job. In accordance with the expected results and consistent with the previous research of Truong Dong Loc (2010).

- The third factor affecting the individual customers' ability to repay debts on time is the variable experience of credit officers. With the significance level of 5% ($dy / dx = -0.04$) in the context of other constant factors, when the experience of the credit officer increases by 1 year, the credit risk is reduced by 0.04 times. In many cases, a credit officer acts as a sales officer, communicating with customers to determine loan needs and persuade them to borrow from their bank. The credit officer will answer questions about the process and sometimes help clients fill out loan applications. When there are risks, the role of credit officers is also very important because they will be a debt collection officer, contacting people with overdue debts to help them find ways to repay debts, avoid bankruptcy in debt. If the repayment plan is not successful, the debt collector will propose the sale of collateral in which the lender seizes collateral: houses, cars, land to pay loan amount. In accordance with expected results and in accordance with previous research by Truong Dong Loc and Nguyen Thi Tuyet (2011).

- The last factor affecting personal credit risk is the number of dependents, the number of dependents reflecting the financial burden of customers because they have to subsidize and nurture those who can no longer work, moving. The analysis results show that if other factors remain constant, at a significant level of 5% ($dydx = 0.04$), customers with an increase in the number of dependents will increase the risk of personal credit multiplier increased 0.04 times. Dependents in the family are mainly elderly parents or young children under working age. In accordance with the expected results and consistent with the previous research of Truong Dong Loc (2010). Besides the above factors, the other factor in the model that is not statistically significant is the borrower's financial capacity (X1); Check and monitor loan debt (X4); Borrower's experience (X6); Loan value (X7); Age (X9).

CONCLUSIONS AND SOLUTIONS

Conclusions

Research results show that:

-Total outstanding loans in research period grew over the years. Specifically, in 2017, total retail outstanding loans were 1,648.36 billion VND and in 2018 increased to 1,752.57 billion VND, equivalent to an increase of 104.21 billion VND. In 2019, an increase of 19.15% equivalent to VND 335.62 million.

- Risk reserve for increase and decrease is not stable during the research period. In 2018, it decreased by 3.17%, equivalent to a decrease of VND 0.6 billion compared to 2017, but in 2019, this fund increased to VND 26.33 billion, up 8.05 billion, or an increase of 44.03%.

Through identifying research problems and research objectives, the authors have put into the model 9 independent variables, the results have 04 variables correlated with the dependent variable that is debt guarantee; Career; Experience of credit officers; Number of dependents. In which, industry variable has the strongest impact on credit risk. From the research results, the authors propose a number of solutions to limit the credit risks of individual customers at Dong Thap BIDV in the next time.

Solutions

Based on the findings and conclusions, to minimize credit risks of individual customers at Dong Thap BIDV, the authors propose a number of related solutions as follows:

1. Dong Thap BIDV should focus on examining customer's ability to pay debts.
2. Dong Thap BIDV should control and take care of loan applications with a high number of dependents.
3. Dong Thap BIDV should develop and improve the quality of credit officers' resources.
4. Dong Thap BIDV should consider the borrower's income through the profession.
5. Other solutions (Diversifying credit products; Completing credit process; Completing interest rate policy; Modernizing banking technology).

REFERENCES

1. Nguyen Ngoc Le Ca, 2011. *Personal credit development solutions at Joint Stock Commercial Bank for Foreign Trade of Vietnam*. Master thesis, University of Economics, Ho Chi Minh City.
2. Nguyen Thi Canh & Pham Chi Khoa, 2014. *Application of KMV - Merton model for forecasting corporate credit risk and potential loss of banks*. Economic Development Journal, No. 289, p. 39-57.
3. Mai Binh Duong & Le Hoang Anh, 2017. *Macroeconomic fluctuations and credit risks of the Bank for Agriculture and Rural Development of Vietnam*. Scientific Journal of Van Lang University, No. 01/2017, p. 93-104.
4. Phan Dinh Khoi and Nguyen Viet Thanh, 2017. *Micro factors affecting credit risk: The case of state-owned joint stock commercial banks in Hau Giang*. Science Journal of Can Tho University. 48d: 104-111.

5. Truong Dong Loc & Nguyen Van Steel, 2015. *Factors affecting the credit risk of people's credit funds in the Mekong Delta region*. Journal of Economic Research, No. 444 - May 2015.
6. Truong Dong Loc and Nguyen Thi Tuyet, 2011. *Factors affecting the credit risk of Joint Stock Commercial Bank for Foreign Trade, Can Tho Branch*. Banking Journal, No. 5, pp. 38-41.