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FACTORS AFFECTING CREDIT RISK OF INDIVIDUAL CUSTOMERS AT BANK FOR FOREIGN TRADE OF VIETNAM CAN THO BRANCH

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ABSTRACT

The study "Factors affecting individual customer credit risk at Can Tho VCB will be conducted from 2021-2023. The study used comparative and absolute numerical analysis methods; Descriptive statistics and Probit regression methods to identify factors affecting credit risk. The research results show that of the 09 independent variables included in the research model, 05 variables correlate with the dependent variable, which is the borrower's financial ability (X1); Occupation (X3); Check and monitor loan debt (X4); Experience of credit officers (X5); Number of dependents (X8). In particular, the variable that has a positive correlation with the dependent variable is the number of dependents; The borrower's industry variable is the variable that has the strongest impact on the dependent variable, followed by the borrower's financial ability variable. Based on the research results, the author proposes several solutions to improve credit efficiency for Can Tho VCB such as selecting experienced credit officers; Assessing the number of dependents; Credit officers strengthening inspection and supervision of loan debt; Increasing the financial security of borrowers; Pay attention to the main industry that generates customers' income when reviewing loan applications.

Keywords: Can Tho VCB, individual customer, credit risk, factor analysis.

1. INTRODUCTION

Vietnam's integration into the global economy has brought many opportunities but also many challenges for banks. With the characteristics of a sensitive business field, influenced by many factors both directly and indirectly, large banking risks are unavoidable and have the potential to become a risk of serious impact. Focus on the sustainable development of banks in particular, financial markets, and the economy in general. In recent years, businesses have been inefficient, and individual customers have gradually become the leading strategic development targets of commercial banks. Banking products and services, especially credit products, are being provided by banks and are very diverse and rich and have become key competitive tools. Not only Vietnamese Joint Stock Commercial Banks (JSC) but also famous foreign banks or newly established financial companies offer many strategies to attract science and technology. In fact, with small loans, compared to other types of conventional loans, consumer loan capital is deployed quite easily, becoming a loophole for nefarious subjects to take advantage of, appropriate capital, and outsiders. Besides, lending to science and technology also has many potential risks and consequences, thereby showing that credit risks for individual customers have not been given due attention. According to the State Bank, by the end of 2023, the on-balance sheet bad debt ratio will be 1.9% (an increase of 0.21 percentage points compared to the end of 2022). If we also include debt sold to asset management companies, the figure is 3.9%. Gross bad debt ratio (including on-balance sheet bad debt, unresolved bad debt sold to VAMC, and potential bad debt from restructured accounts) increased sharply to 7.31% at the end of 2023 from 5.1%. % end of 2022. In 2023, although business results continue to grow positively, COVID-19 has cast a shadow on Can Tho Vietcombank's bad debt. The financial report shows that Can Tho Vietcombank's bad debt as of December 31, 2023, is 24,553 billion VND, and the bad debt ratio at the end of 2023 is 1.71%, an increase of 0.14%. Can Tho Vietcombank's bad debt increase largely due to the impact of the COVID-19 epidemic? The fields in which customers are doing business are tourism, services, trade, retail, and the production of exported consumer goods. , the bank's imports were also heavily affected. Although the State Bank has allowed debt restructuring, the maximum debt restructuring time is 12 months while the epidemic has lasted for the past 2 years, so some loans still have to be transferred to debt groups. Although bad debt problems have been resolved in quite large numbers, with this number, banks still have to have plans for risk prevention and risk management in the granting activities of banks. Credit institutions in Vietnam. On the other hand, personal credit risk is considered the top concern of commercial banks. Therefore, to improve the efficiency of credit operations of science and technology, banks need to promote and expand methods. Mobilize capital to meet customers' loan needs reasonably and recover capital effectively. To achieve the above goal, banks first need to identify the remaining risks, as well as the factors that directly impact credit risks for science and technology, and then come up with appropriate solutions to help Limit credit risks for banks. That is the reason why the authors chose the topic "Factors affecting individual customer credit risk at Can Tho Vietcombank" as the research direction.

2. LITERATURE REVIEW

Financial capacity of the borrower (X1)

Measured by the ratio of the customer's equity capital participating in the project to the total investment capital of the loan project. According to research on credit risk, the stronger the borrower's financial potential, the higher their ability to tolerate risk. Therefore, in this study, the author expects that if the borrower's equity capital participating in the loan project is larger, the lower the cost of paying for the loan capital, they will also invest time and attention. More to the project, so the project will be more successful and thus the risk will be lower, or the financial capacity of the borrower is inversely related to credit risk (Truong Dong Loc, 2010), Phan Dinh Khoi and Nguyen Viet Thanh (2017); Bui Huu Phuoc, Ngo Thanh Danh and Ngo Van Toan (2017).

H1: The financial capacity of the borrower has a negative (-) impact on the credit risk of individual customers.

Loan security (X2)

According to Nguyen Van Tien (1999), the debt recovery ability of secured loans is more certain than unsecured loans. Collateral is a dummy variable that takes value 1 if the loan is mortgaged with real estate and 0 if the loan is unsecured or does not mortgage collateral. Collateral is also a very important component of the loan, it is the second source of repayment if problems occur with the individual's loan. The higher the value of collateral, the higher the ability to repay the bank (Dang Thanh Truc, 2012). In this study, we expect that the greater the ratio of loan amount to collateral value, the higher the risk of the loan, which means that the loan to collateral value ratio is related to proportional to credit risk.

H2: Securing the borrower's debt has a positive (+) impact on the credit risk of individual customers.

Main income sector used to repay loans (X3)

The reality in the Mekong Delta region in recent years shows that the aquaculture and agriculture sectors are not favorable and have many risks, so the ability to generate income Income from this field to repay loans on time is very difficult. Therefore, we expect that the aquaculture and agricultural production sectors have an inverse relationship with credit risk (Truong Dong Loc, 2010).
H3: The main occupation that generates income to repay debt has a negative (-) impact on the credit risk of individual customers.

Loan inspection and supervision (X4):

Previous studies, one of the causes of credit risk is inadequate inspection and supervision after lending. Credit officers who regularly check and supervise loans will promptly capture information on science and technology, promptly recover loans if there are signs of risk, and expect that the more checks there are, the lower the credit risk factor. Inspection and supervision are inversely proportional to credit risk (Nguyen Thi Tuyet, (2010), Bui Huu Phuoc, Ngo Thanh Danh and Ngo Van Toan (2017)).
H4: Checking and monitoring loan debt has a negative (-) impact on individual customers' credit risk.
Experience of credit officers (X5): according to Le Van Tu (2005), the qualifications and experience of credit officers have a great influence on credit risk. A qualified staff can not only analyze the customer's financial capacity and predict the situation well, but can also advise customers to overcome temporary difficulties. The qualifications and experience of credit officers have an impact on credit risk. A credit officer who has knowledge and has worked for many years in credit has the ability to analyze the borrower's financial situation, predict difficulties and can give good advice to the borrower. The longer a credit officer has worked in loan management, the more risks will be limited (Nguyen Thi Tuyet, 2010). In this study, the author expects that the longer a credit officer has worked, the more experienced and qualified he or she will be in appraising and managing loans as well as supporting customers in difficult times. The credit set is inversely proportional to credit risk.
H5: The experience of credit officers has a negative (-) impact on the credit risk of individual customers.

Borrower experience (X6)

Studies on credit risk have concluded that management capacity and borrower experience are important factors for the successful implementation of loan projects. or fail. People with more experience will be better able to predict the situation and respond to unforeseen circumstances. In this study, the author expects that the longer people have worked in a certain profession, the higher the likelihood of success, or that the borrower's experience is inversely proportional to credit risk (Truong Dong Loc, 2010).
H6: Borrower experience has a negative (-) impact on individual customers' credit risk.

Loan value (X7)

research by Tran Thi Tuyet Lan Anh (2015) concluded that the higher the loan amount, the cheaper management costs are than small loans, but the larger the loan amount, the higher the risk, because If the loan value is large, the monthly payment will be high, leading to increased debt repayment risk. In this study, the author expects this variable to be proportional to the dependent variable (Truong Dong Loc, 2010).
H7: Loan value has a positive (+) impact on individual customers' credit risk.

Number of dependents (X8)

The more dependents who do not generate income, the higher the risk level. The number of dependents will create an additional cost burden for the borrower, leading to affected loan repayment ability and resulting in high credit risk (Tran Thi Tuyet Lan Anh, 2015). In this study, the author expects this variable to be proportional to the dependent variable.
H8: The number of dependents has a positive (+) impact on the credit risk of individual customers.

Age (X9)
According to the author, the level of credit risk may vary depending on age. The older you are, the higher your reputation and trust compared to younger people, so the younger you are, the higher your credit risk (Tran Thi Tuyet Lan Anh, 2015). In this study, the author expects this variable to be inversely proportional to the dependent variable.
H9: Age has a negative (-) impact on the credit risk of individual customers.
Based on the theoretical background and previous research results, the authors propose the following research model:

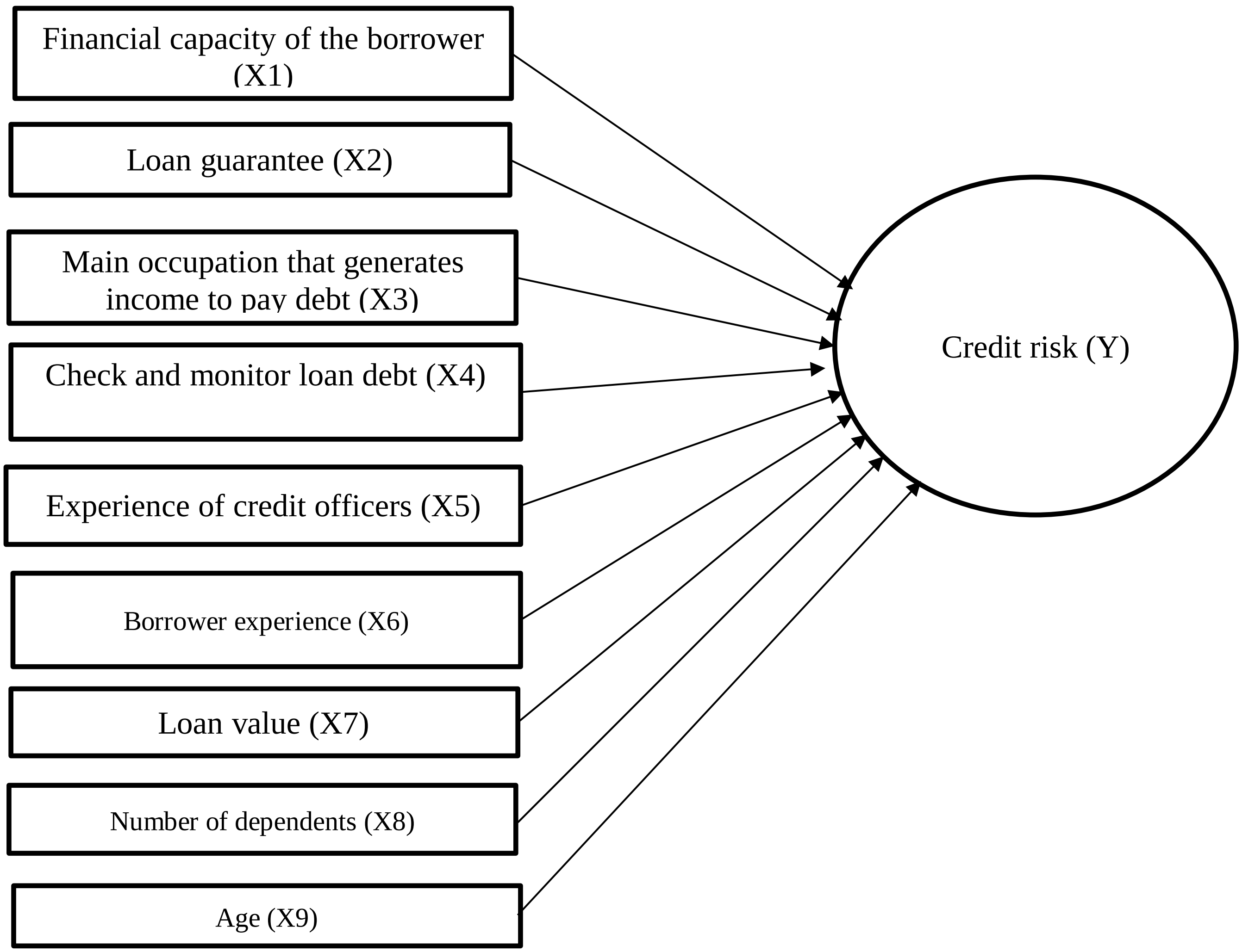

Figure 1. Proposed research model
Source: The authors propose from relevant studies, 2024

3. RESEARCH METHODS

Qualitative research & Quantitative research

Qualitative research was conducted by discussing a group of experts through open questions to identify and analyze factors affecting individual customer credit risk at Can Tho Vietcombank. Open-ended questionnaires were used for interviews and group discussions to adjust scales and concepts accordingly.

Quantitative research is conducted by surveying based on a pre-designed questionnaire. The survey sample in the official study was conducted using the convenience sampling method. After collected data will be processed using SPSS software. Using probit regression method to identify and measure factors affecting personal credit risk at Can Tho Vietcombank to clarify issues related to the research hypothesis.

4. RESEARCH RESULTS

Describe the overall sample

According to Nguyen Dinh Tho (2011) simple random sampling method, sample size is determined according to the empirical formula: $n >= 50 + 8p$

In which, n is the minimum required sample size, p is the number of independent variables in the model. Thus, the minimum number of observations needed for research is 122 observations. The author collected 150 observations to ensure reliability.

The way to select the sample is to arrange the loans that satisfy the above criteria in order of the customer's name and select the systematic sample with a step of 2 until there are enough observations as required. After choosing the customer's name, conduct a credit profile survey to collect the necessary data and information. As for the borrower's experience factor, some records were not fully presented, so the author had to collect them from customers and add them to the research data through records managers. Customer approaches will be randomly approached according to the hop position arranged in the list.

Probit model

According to Mai Van Nam (2008), the Probit model is applied in the case where the dependent variable has two values: 0 and 1. This study has a dependent variable that is whether science and technology loans are risky or not, measured by two values 0 and 1.

The probit model used in the study has the following form:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \beta 7X7 + \beta 8X8 + \beta 9X9 + \varepsilon$$

In there:

Y: is the dependent variable, takes value 1 if the borrower has credit risk (bad debt in groups 3, 4, 5) and takes value 0 if the borrower does not have credit risk (debt in debt groups 1 and 2); Xi: is the independent variable and is explained in detail in table 3.1.

Table 1.Interpretation of independent variables in the regression model

Variable	Measuring	Expectations
Financial capacity of the borrower (X1)	Own capital in the project/Total capital of the loan project	-
Loan security (X2)	Value of collateral/Loan amount	-
A main occupation that generates income to repay debt (X3)	Dummy variable, is equal to 1 if the main source of income to repay debt is from aquaculture and agricultural production, equal to 0 if in other fields	-
Checking and monitoring loan debt (X4)	Total number of times checked before the loan turned into bad debt/Total time borrowed until the loan incurred bad debt in years	-
Experience of credit officer (X5)	Number of years directly working in credit work of Credit Officer	-
Borrower's experience (X6)	Number of years the borrower has worked in the loan industry up to the time of loan	-
Loan value (X7)	The amount borrowed by the borrower at the bank (million VND)	+
Number of dependents (X8)	Number of people unable to work, over working age, under working age living in the family	+
Age (X9)	Age of customer -	-

Source: Author's compiled results from previous studies

Analyze factors affecting personal credit risk at Can Tho Vietcombank.
Before regression analysis, the author conducted correlation analysis (results in Appendix 1). The results of correlation analysis show that the factors that are correlated with the dependent variable are the financial capacity of the borrower; Career; Check and monitoring loan debt; Experience of credit officers; The number of dependents due to the Sig value of the variables <0.1 (10%), the remaining variables have no correlation with the dependent variable. Estimated results from the regression model are presented in Table 2.

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Table 2. Factors affecting personal credit risk at Can Tho VIetcombank

Independent variable	**Regression coefficient**	**Coefficient dy/dx**	**Value z**	**Significance level**
Constant	9,82	-	2,26	0,02
Financial capacity of the borrower	-5,84	-0,35	-1,85	0,06
Loan security (X2)	-0,01	-0,00	-0,09	0,93
A main occupation that generates income to repay debt (X3)	-3,41	-0,52	-2,32	0,02
Checking and monitoring loan debt (X4)	-0,26	-0,02	-1,97	0,05
Experience of credit officer (X5)	-1,62	-0,09	-2,85	0,00
Borrower's experience (X6)	0,09	0,01	0,31	0,76
Loan value (X7)	-0,00	-0,00	-0,99	0,32
Number of dependents (X8)	1,65	0,09	2,53	0,01
Age (X9)	-0,01	-0,00	-0,28	0,78
Number of observations				150
LR value				174,82
Prob>Chi^2				0,000
Pseudo-R^2				88,68

Source: Results of statistical data processing, 2024

Based on Table 2 we have the following results:

The pseudo-R2 coefficient is the coefficient that explains the influence of variables on the dependent variable which is the customer's ability to repay debt. We see that the pseudo-R2 coefficient of the model is 88.68, which means that 88.68% of the dependent variable is explained by the independent variables in the model, and the remaining 11.32% are other factors. Included in the research model or included but did not reach statistical significance.

Prob value > Chi2 = 0.0000 < 0.05 indicates that the model is suitable at the 5% significance level and we reject hypothesis H0: all independent variables are included in the model and there are no influencing variables. Affecting the ability of individual customers to repay loans means that the factors in the model have an impact on the ability of customers to repay loans.

The analysis results in Table 2, it shows that of the 09 independent variables included in the research model, 05 variables correlate with the dependent variable, which is the borrower's financial capacity variable (X1); Occupation (X3); Check and monitor loan debt (X4); Experience of credit officers (X5); Number of dependents (X8). In particular, the variable that has a positive correlation with the dependent variable is the number of dependents. In particular, the borrower's industry variable is the variable that has the strongest impact on the dependent variable, followed by the borrower's financial ability variable.

Factors affecting personal credit risk at Can Tho Vietcombank are analyzed at the 10% significance level as follows:

The first factor affecting personal credit risk is the borrower's financial capacity variable (X1), (dy/dx= -0.35). The higher the customer's financial capacity and the more secure, the lower the credit risk. Analysis results show that if other factors remain unchanged, customers whose financial capacity increases by 1 time will reduce credit risk by 0.35 times. It is recommended to quantify indicators to measure customers' financial capacity such as limit usage rate, number of days overdue, fluctuations in cash flow in and out... to increase efficiency and ensure data is updated over time. real time. Consistent with expected results and consistent with previous research by Phan Dinh Khoi and Nguyen Viet Thanh (2017), Nguyen Quang Truong (2020).

The second factor that affects personal credit risk is industry. If the customer's main source of income to repay debt comes from aquaculture and agricultural production, credit risk will decrease and from other industries, credit risk will increase. With a 10% significance level (dy/dx = -0.52), if the customer's main source of income from fisheries and agricultural production increases to 1 million, the possibility of causing credit risk will decrease to 0. 52 times. The survey shows that in the O Mon area, individual customers mainly earn income from aquatic resources and agricultural production, so this also brings convenience to customers if their main source of income is from this job. Consistent with expected results and consistent with previous research by Phan Dinh Khoi and Nguyen Viet Thanh (2017), Nguyen Van Dua (2020).

The third factor that affects individual customers' ability to repay debt on time is the variable of loan inspection and monitoring. With a significance level of 10% (dy/dx = -0.02) under the condition that other factors remain unchanged, when checking and monitoring loan debt of credit officers increases by 1 time, credit risk decreases by 0. .02 times. Regular inspection and supervision will help manage loans better, ensuring households will use loans for the right purpose. In addition, the bank will have solutions to promptly correct those who use capital for the wrong purpose, and can even recover capital if farmers do not adjust the correct purpose of capital use. Consistent with expected results and consistent with previous research by Bui Huu Phuoc, Ngo Thanh Danh and Ngo Van Toan (2017), Tran Thi Mong Lan (2019).\

The fourth factor that affects individual customers' ability to repay debt on time is the experience of credit officers. With a significance level of 10% (dy/dx = -0.09) under the condition that other factors remain unchanged, when a credit officer's experience increases by 1 year, credit risk decreases by 0.09 times. In many cases, loan officers act as sales staff, contacting customers to determine loan needs and convincing customers to borrow money from their bank. Loan officers will answer questions about the process and sometimes help customers fill out loan applications. If a credit officer has experience, it will be easy to recognize instability in a customer's loan application to decide whether to lend the customer a loan or not. A skilled credit officer, when detecting instability, will ask the customer to provide additional information or, in the case of commercial credit, a copy of the individual's financial documents. Only then can credit officers analyze finances and evaluate risks to minimize risks for the bank. When facing risks, the role of credit officers is also very important because at this time they will be a debt collection officer, contacting people with overdue debts to help them find ways to repay the debt and avoid default. in debt. If the repayment plan is not successful, the debt collector will propose a collateral sale in which the lender confiscates the collateral: house, car, land, etc. to pay off the debt. loan amount. Consistent with expected results and consistent with previous research by Nguyen Van Dua (2020), Nguyen Quang Truong (2020).

The final factor that affects personal credit risk is the number of dependents. The number of dependents reflects the customer's financial burden because of having to subsidize and care for those who are no longer able to work dynamic. The analysis results show that if other factors remain unchanged, at the 10% significance level (dy/dx=0.09), customers whose number of dependents increases by 1 person will increase their personal credit risk increased by 0.09 times. The dependents in the family are mainly elderly parents or young children who are not yet of working age. Therefore, the cost for these subjects is quite high. Old age requires a lot of medical care, and young children have to pay for education in addition to medical care in addition to normal living expenses. Therefore, customers with many dependents will have more difficulty repaying their debt to the bank. Consistent with expected results and consistent with previous research by Tran Thi Tuyet Lan Anh (2015), Nguyen Van Dua (2020), Nguyen Quang Trung.

5. CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

Through research results, the authors have achieved the following results:

Regarding the current status of the bank's credit activities, the bank's income tends to increase gradually over the years. Specifically, in 2021 it will be 135 billion VND, by 2022 the income will be 140 billion VND, an increase of 5 billion VND compared to 2021. By 2023, income will decrease by 16 billion compared to 2022, due to the impact of the Covid pandemic. -19 broke out strongly this year, leading to an unstable economy, leading to a significant decrease in bank income. The cost in 2021 is 99 billion VND and in 2022 it is 105 billion VND, an increase of 6 billion VND. In 2023, the economy faces many difficulties due to the stressful epidemic situation, so the banking industry's task is to reduce interest rates for businesses and reduce operating costs. Therefore, costs in 2023 will decrease significantly compared to 2022, specifically 13 billion. In general, over the past 3 years, the bank's profit level has decreased but not significantly. Specifically, in 2021 the bank's profit was 36 billion VND, in 2022 it decreased to 35 billion VND, followed by 32 billion VND in 2023. The decrease in profits is due to the difficult economy and the impact of the epidemic. Although the economy is difficult and volatile, the market always has fierce competition from existing competitors in the area, both in quality and quantity. But the Bank still ensures effective operations and timely response to capital. It is the result of the efforts of all employees under the active leadership of the Board of Directors and, most importantly, the trust of customers, that Can Tho Vietcombank has achieved many successes. work like today. Besides, to evaluate the suitability of the factors when included in the model, the project conducted correlation analysis, the results showed that the factors that correlate with the dependent variable are the financial capacity of the borrower; Career; Check and monitoring loan debt; Experience of credit officers; Number of dependents due to Sig value of variables

<0.1 (10%). The regression results were quite good when identifying 05 out of 09 variables included in the model that influence the dependent variable, which is the borrower's financial capacity variable (X1); Occupation (X3); Check and monitor loan debt (X4); Experience of credit officers (X5); Number of dependents (X8). Based on the research results, the author has proposed several solutions as follows: (1) Increase the financial security of borrowers; (2) Pay attention to customers' main income-generating industries when reviewing loan applications; (3) Select credit officers with extensive experience; (4) Assess the number of dependents; (5) Credit officers strengthen inspection and supervision of loan debt.

Policy implications

To minimize credit risk in the coming time, banks need to implement some of the following key solutions:

Increase the borrower's financial security

The financial capacity of the borrower is considered based on the customer's own capital in the total capital for production and business. Therefore, when credit officers review loan applications, they should pay attention to evidence of equity capital. Practice shows that when loan capital is large, the customer's cost burden increases, leading to a decrease in the ability to rotate capital to repay debt to the bank, causing credit risk to increase. To ensure financial risk reduction, there are 2 suggestions as follows:

+ On the customer side, it is necessary to ensure that financial capacity is honest with the individual's actual conditions to both prevent personal credit risks when not being able to pay due to lack of financial ability. In case a customer prepares a loan application with high integrity, it will both help the customer and the bank in the loan approval process, creating conditions for the bank to quickly review the loan application to promptly disburse money to the borrower. client.

+ On the bank's side, credit officers should check loan applications closely to avoid cases where credit officers have negative behavior in approving customers' loan applications based on close relationships. That will put both customers and banks at high risk of not being able to repay debt.

Pay attention to the main occupation that generates customers' income when reviewing loan applications

According to research results, the main industry that generates income for customers is from aquaculture or agriculture, which will help customers have a higher ability to repay debt than other industries, which will reduce credit risk. personal use for banking. Therefore, when reviewing loan applications, banks need to pay attention to customers who have land for aquaculture and agriculture in addition to other income-generating industries for customers. Besides, it is necessary to pay attention to the agricultural land area for farming and production of customers. With a large land area, farming conditions will be more favorable, bringing higher income to customers. Banks should also pay attention to the area of leased land that is not owned by customers to consider the level of risk when doing business on leased land, because rented land will cost more.

Select credit officers who have significant experience.

Previous studies also show that experienced credit officers will help review loan applications with fewer errors and limit personal credit risks for banks. Experienced credit officers will have more in-depth vision, judgment and analysis when receiving capital financing applications. Proficiency in consulting as well as mastering bank regulations in lending will be of great help to customers because each customer has different levels and understanding abilities. When customers have guaranteed information and clearly understand that information, it will help customers avoid errors when preparing loan documents as well as ensure loan documents. For experienced credit officers, customers also have higher confidence in receiving consulting information and creating conditions for customers to quickly decide to borrow capital at banks.

Assess the number of dependents

Banks need to accurately determine the number of dependents of customers and give priority to considering the group of dependents who are unable to work because these people will be a huge burden for the customer's family. row. For dependents who are young children still going to school, there will be support from organizations, schools or a loan policy from policy banks to support children going to school. This is also an important aspect of considering dependents. If the bank only evaluates the quantity in general, the customer's loan application will be misleading and not highly effective.

Credit officers strengthen inspection and supervision of loan debts

Credit officers need to take measures to regularly check and monitor farmers' loans to ensure that farmers use capital for the right purposes. Report the capital use situation of farmers to the branch periodically and regularly. In cases where capital is discovered for improper purposes, it is necessary to immediately report to the branch for solutions and adjustments. Credit officers are not allowed to cover up for farmers based on relationships that increase the risk of loans, causing damage to the bank as well as reducing the customer's ability to repay debt.

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