THE EFFECTS OF CREDIT CONTROL PROCESSING ON THE EFFECTIVENESS OF CREDIT RISK MANAGEMENT: THE CASE OF BRANCHES AT AGRIBANK IN HANOI, VIETNAM

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Abstract

The study focused on analyzing the effects of credit control on the effectiveness of credit risk management at the branches of the Bank for Agriculture and Rural Development in Hanoi, Vietnam through the assessment of credit employees. Three independent variables used include Credit control before procedures; Credit control in borrowing procedures and Credit control after procedures. Research results show that all three independent variables have positive influence to the dependent variable, Credit control before borrowing has the greatest impact on the effectiveness of credit risk management, then comes control variable after and finally controls while borrowing. Therefore, in this study, independent variables can be used to make credit decisions and improve the quality of human resources to improve the effectiveness of credit risk management at the branch.

Key Words: Credit, Credit risk, Credit control, Credit risk management, Effectiveness, Effectiveness of credit risk management, Agri bank.

Introduction

The process of globalization forces the Vietnamese banking industry to overcome itself and to embrace the tendency of corporatization, groupization, and multi-ownership. These trends require more rigorous reform of the legal environment and restructuring of the business operations, leading to a restructuring of the entire banking system. In this context, Vietnam's commercial banks with limited resources are facing a variety of risks in which credit risk is one of the riskiest types of all to the operation of each commercial bank if it occurs. It is time for credit risk management to be identified by commercial banks as a key strategic task, to force banks to actively manage the loan portfolio to mitigate losses and gain profit. Credit risk management is an integral part of the loan process. It maximizes bank exposure by adjusting the rate of return risk by maintaining exposure to credit risk to protect banks from the negative impact of credit risk. Credit risk management is simply a practical activity of the systematic selection of efficient methods to minimize the impact of the implementation of the threat to the institution. All risks are unavoidable or partially mitigated simply because of financial and practical constraints (Moteff, 2005). In recent years, Agribank has been also well-known for its reputation as a leading bank providing state-of-the-art and convenient service packs. Since 2010, due to the impact of the global financial crisis and the government's macroeconomic management policies, Agribank has faced many difficulties. According to audited data, Agribank's outstanding debt is VND 23,652 billion, accounting for 59.23% of total outstanding loans, equal to 89% of charter capital. Thus, Agribank's total bad debt reached approximately 40,000 billion, higher than the chartered capital of about 10,000 billion (Hoai, 2014). Some

officials and employees of Agribank violated professional ethics standards and were prosecuted for "irresponsibility in economic management causing serious consequences", which greatly affected the prestige and reputation of Agribank. Credit risk is defined as the probability in which a client will not be able to pay back the stated amount to the bank in accordance with the terms agreed in the credit agreement. Credit risk occurs in relation to the potential return on an investment that makes the bank face the risk of bankruptcy. Both domestic and foreign studies confirm that the most tremendous risk for banks is the credit risk. The purpose of this study is to identify the factors that influence the efficiency of Agribank's credit risk management in Hanoi.

Credit risk control also helps ensure that the operations of all departments and individuals in the bank comply with the law, implement strategies, policies, processes, and decisions of all levels, to ensure the secure and efficient operations of the bank. According to Cosin D.H Pirotte (2001), credit risk control includes pre-lending control, while-lending control, and post-lending control. Pre-lending control: Establishment of a document of credit policy and procedure; Verification before lending and Approval of the loan. According to Cosin D.H Pirotte (2001), it includes controlling the process of establishing policies, procedures, lending procedures, and the process of compiling loan applications and evaluations. The inspectors shall make comparison with the provisions to check the completeness and legality of the loan dossiers, check the accuracy of the calculated and appraised figures in the credit dossiers; Check the loan statement and related records to comprehend the creditors points of view, the opinion senior creditors' opinions, the leaders' approval and the approval of cases more than jurisdiction. Credit control in borrowing procedures: At this stage, credit officers must collect information from different sources to check the use of customer loans for loan purposes or not? After the customer completes, add the required documents, credit officers will conduct an inspection, final control of records prior to disbursement. If the customer has fully complied with the requirements of the bank, the credit officer will enter the necessary information of the customer into the IPCAS system (Loan amount, principal repayment period, interest rate, loan term, etc.) and coordinate with the relevant staff to disburse. Credit control after of the borrowers: Monitoring and Urging debt recovery; Credit review and credit rating; Independent internal credit control and Revaluation of credit policy (Cosin D.H Pirotte, 2001). However, in recent years, commercial banks have not done well on this task is due to psychological factors troubling concern for customers, partly because management information system business of the business is too backward, not providing timely, full of information that commercial banks require. This makes banks difficult to control cash flow and high risk. Therefore, credit decision and credit portfolio management should be closely linked to limit monitoring (Bernanke, 2006).

Credit risk management efficiency is viewed in different perspectives, Carrie M. Franklin and Jeffrey R. Schmidt (2016), suggest that risk reduction can be achieved through the early detection of irregular loans, allowing the bank to intervene sooner. Khalidi (2010) identifies the internal factors affecting the productivity of the loan portfolio and credit in Iraqi banks. The author found a relationship with the return of the loan portfolio and dependent variable on the size of the bank, adequate capital and liquidity of the bank, advertising costs and a long history of banking. Abedalfattah Zuhair Al-abedallat(2016); To Ngoc Hung (2015); Erika Spuchľáková, Katarína Valašková and Peter Adamkoc International (2015), the bank's commitment to the central bank's guidelines reduces the risk of credit risk. Particularly, clear credit policy plus credit risk monitoring system at the customer level and credit risk monitoring at the credit level, the portfolio will help increase the efficiency of credit risk management in commercial banks. Commercial banks have a credit risk monitoring system at the customer level to help the bank monitor the implementation of contractual conditions, financial situation of customers. Regular

monitoring and identifying changes in affordability is an important tool for managing risk. The authors also point out that the frequency of credit risk exposure depends on the reliability of the client. All abnormal customer signs such as: have new records in the bank or nonbank register; changes in financial indicators outside of tolerance limits; change in the amount of turnover on the account; payment after the due date.... are considered as abnormal signs and forced banks to take precautionary measures. Credit risk monitoring at credit and bank portfolio demonstrated basic rules of credit risk management is diversification principle to divide the risk. The level of diversification of the credit portfolio is significantly related to the customer's focus on the bank. If the bank offers a large amount of credit to customers, mainly for households, the degree of diversification is higher than that of banks providing credit to large corporations. The quality of the bank's credit portfolio depends on the economic position of the individual borrower. Setting credit policy basing on diversification in types of credit and time is required to reduce the level of credit risk.

Research methodology

Research Area: The author focuses on 34 type I Branches of Agribank in Hanoi, Vietnam. These employees are currently working for at least 8 hours per working day at the above Agriculture Bank branches. In the case of short-term contracts of 12 months or less, "part-time" employees, part-time workers are not surveyed in this study.

Determination of sample size: According to the M. H. Alvi (2016), in this study, the total is understood to be the total number (1317) of officially recruited employees working in various positions related to credit operations, with different positions in the branches of Agribank in Hanoi. The formula of Slovin as given by Sevilla, et.al, (1998) could be useful in determining the sample size of the population: the sample chosen in this study when e = 5% and N = 1317 (the size of credit employees in the branches of Agribank in Hanoi, Vietnam), the sample size will be:

$$ n = \frac{1317}{1 + 1317\,(.05)^2} $$

n = 307

The questions are based on the inheritance of previous studies: Abedalfattah Zuhair Al-abedallat (2016); To Ngoc Hung(2015); Erika Spuchľáková, Katarína Valašková and Peter Adamkoc(2015) and author proposed. In this questionnaire, the author uses the Likert Scale 5 levels (1. Strongly disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Strongly agree). At each level of this scale showing different levels of consensus or disagreement with credit employees Agribanks in Hanoi, Vietnam.

□ **Research model**

Based on the theoretical background and qualitative research results. The research model proposed by the author includes three independent variables:(1) Credit control before procedures, (2) Credit control in borrowing procedures; (3) Credit control after procedures, and the dependent variable is the effectiveness of credit risk management.

Figure 1. Research model

CREDIT CONTROL PROCESSING
- Credit control before procedures
- Credit control in borrowing procedures
- Credit control after procedures

THE EFFECTIVENESS OF CREDIT RISK MANAGEMENT
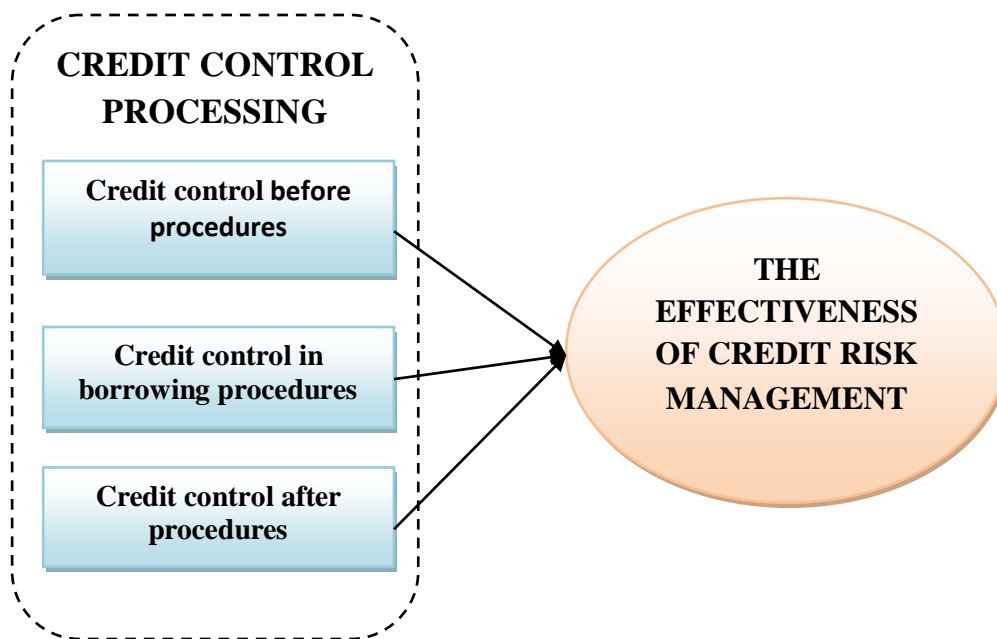
Based on the proposed research model, the research hypotheses are:

H1: Credit control before the bank's borrowers has a positive impact on the effective management of credit risk at the branches of Agribank in Hanoi, Vietnam.

H2: Credit control in borrowing procedures of the borrowers has a positive impact on the efficiency of credit risk management at the branches of Agribank in Hanoi, Vietnam

H3: Credit control after of the borrowers has a positive impact on the efficiency of credit risk management at the branches of Agribank in Hanoi, Vietnam

Results and discussion

 Assessment of respondents on credit control processes of Agribank branches in Hanoi, Vietnam

The statistical results showed that, in the three factors of credit control, the credit control before borrowing factor was rated with Mean = 3.28, then comes the credit control in borrowing procedures with Mean = 3.08 and finally, employees of credit of Agribank branches in Hanoi are not satisfied with credit control after of the borrowers and evaluate the lowest point in the third medium factors, Mean = 2.86 (Table 1).

Table 1: Mean distribution of one-sample T-test in term of Credit

Control processes

Items	Mean	Std. Deviation
Credit Control before borrowing – Befo 1. Bank employees can verify the financial capacity, legal records, and collateral assets, borrowing purposes of clients from various	2.64	0.86

sources.		
2. The feasibility of the borrower's loan plan and actual revenue sources.	3.84	0.91
3. The Bank highly appreciates the level of compliance of customers with regulations related to labor law, tax, environment, food hygiene, and safety.	3.62	0.97
4. Marking customer credit with customer profiles and customer analytics is always done by me in accordance with regulations	3.02	0.82
Mean score of the factor	**3.28**	**0.84**
Credit control in borrowing procedures - Inpro 1.Investigate carefully the conditions of disbursement of customers, especially business loans, projects	2.52	0.88
2. Controlling customer loan conditions is a regular activity at a bank	2.47	0.89
3. The inspection, control of objects and purpose of borrowing customers is an indispensable stage before disbursement	4.26	0.84
Mean score of the factor	**3.08**	**0.79**
Credit control after of the borrowers -Af 1. Bank employees adhere to the actual control plan, on the software of the system after approval.	2.23	0.79
2. After loan disbursement, the bank employees directly check and compare the documents with the actual situation of using the capital of customers.	2.44	0.80
3. Providing periodical reports on the use of loans, income situation, conversion of collateral assets of borrowers	3.38	0.76
4. Credit employees have an ability to recognize credit risk signs by maturing, late repayment, etc.	3.90	0.82
5. Credit employees are aware of early warning and timely credit shows signs of deterioration and proposed handling plans	2.31	0.87
Mean score of the factor	**2.86**	**0.72**

Note: One sample T-test with the value of 3 equivalent to the neutral scale

In Credit Control before borrowing, the respondent affirmed "The feasibility of the borrower's loan plan and the actual source of funds" is the most focused (mean = 3.84), then to "The bank highly appreciates the level of compliance of customers with regulations related to labour law, tax, environment, food hygiene and safety" (mean = 3.62) and the lowest is the "Bank employees can verify the financial capacity, legal records, and collateral assets, borrowing purposes of clients from various sources" (mean = 2.64). This shows that most of the respondents asserted, "Bank employees can verify financial capacity, legal records, and collateral assets, borrowing clients "purposes from various sources" it is not an issue that needs to be addressed in controlling the borrower's credit before borrowing the bank.

The results of the survey in Table 1 also indicate that in Credit Control in Borrowing Procedures, credit employees are particularly interested in "The inspection, control of objects and purpose of borrowing customers is an indispensable stage before disbursement" (mean = 4.26). Meanwhile, most of the respondents have confirmed, "Investigate carefully the conditions of disbursement of

customers, especially business loans, projects" and "Controlling customer loan conditions is a regular activity at a bank" has not really paid attention, with the average score of 2.52 and 2.47 respectively.

In credit control after of the borrowers, most respondents said they "ability to recognize credit risk signs by maturing, late repayment, etc" and "Providing periodical reports on the use of loans, income situation, conversion of collateral assets of borrowers" with mean = 3.90 and 3.38. However, most of the comments said that credit employees are not aware of the importance of early warning and timely credit shows signs of deterioration and proposed handling plans. Bank employees adhere to the actual control plan, on the software of the system after approval is very limited. This reflects the loosening of management over the borrower after the bank disburses.

 Assessment of respondents on credit risk management in term of levels of efficiency

Table 2: Mean distribution of one-sample T-test in term of Credit Risk Management

Credit Risk Management – CRI	Mean	Std. Deviation
1. Study of the elements of credit decision before the grant reduces the risk of credit Size.	2.64	0.84
2. The focus on cash flows for the client as a principal source of repayment reduces the credit risk.	3.09	0.78
3. The banking supervision of the Central Bank on extended credit by banks reduces the risks of credit.	3.11	0.82
4. The bank's commitment to the instructions of the central bank lowers the risk of credit.	2.82	0.81
5. The presence of a clear credit policy of the bank reduces the credit risk.	3.14	0.80
6. Credit risk monitoring systems at the customer level and credit risk monitoring at the credit and portfolio level will increase the efficiency of credit risk management in commercial banks.	2.81	0.93
Mean score of the factor	**2.94**	**0.89**

Note: One sample T-test with a value of 3 equivalent to the neutral scale

Table 2 shows that at the significance level of 0.05, the means of the perceptions for that "The presence of a clear credit policy of the bank reduces the credit risk" and "The banking supervision of the Central Bank on extended credit by banks reduces the risks of credit" having the highest score in the rating scale, with average points respectively 3.14 and 3.11. Which means there is, clear credit policy of the bank and banking supervision of the Central Bank on extended credit by banks reduces the risks of credit. Besides, employees of the credit Agribank branches in Hanoi, Vietnam also confirmed that: "The focus on cash flow for the client as a principal source of repayment will reduce the credit risk" with mean = 3.09. However, most of the staff credit for that: "Credit risk monitoring systems at the customer level and credit risk monitoring at the credit and portfolio level will increase the efficiency of credit risk management in commercial banks and "Study of the elements of credit decision before the grant reduces the risk of credit Size" are two factors that have little impact on Agribank credit risk management (mean 2.81 and 2.64 respectively). This result reflects the subjective perception of Agribank credit employees because in recent corruption cases of Agribank are partly from the weakness in

credit monitoring systems at the customer level and the negligence of credit employees' study of credit decision before the grant reduces.

☐ **The result of Scale reliability**

The Cranach's Alpha reliability testing is a scale-measuring tool that uses to eliminate unsatisfactory variables. Variables with Corrected Item-Total Correlation less than 0.30 will be rejected. The Cranach's Alpha coefficient of 0.6 or more can be useable in the case of new research (Nunn ally, 1994). Cranach's Alpha range from 0.7 to 0.8 is usually available; scale from 0.8 to 1.0 is a good scale. All variables have Corrected Item-Total Correlation are greater than 0.3 except 1 variable: CRI6 (coefficients of the variable is 0.091 < 0.3). After eliminating of CRI6 - Establishment of credit policy based on the diversification in the field of credit type and duration, and it reduces the amount of credit risk, the second Cranach's Alpha has been carried out and the results are as table 3.

Table 3. The result of the Cranach's Alpha (2nd)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
INDEPENDENT VARIABLES				
Cronbach's Alpha of Credit Control before borrowing – Befo = 0.810				
Befo1	11.26	5.342	.584	.783
Befo2	11.06	5.365	.652	.750
Befo3	11.06	5.314	.621	.764
Befo4	11.08	5.275	.653	.749
Cronbach's Alpha of Credit Control in borrowing procedures – Inpro = 0.853				
Inpro1	7.69	3.024	.703	.813
Inpro2	7.67	2.752	.730	.789
Inpro3	7.61	2.892	.739	.779
Cronbach's Alpha of Credit Control after borrowing – Af = 0.882				
Af1	15.67	7.830	.685	.864
Af2	15.62	7.445	.813	.834
Af3	15.58	7.728	.736	.852
Af4	15.63	8.045	.630	.877
Af5	15.53	7.805	.724	.855
DEPENDENT VARIABLE				
Cronbach's Alpha of Credit Risk Management – CRI = 0.937				
CRI1	16.11	8.654	.851	.919
CRI2	16.15	9.099	.749	.936
CRI3	16.14	8.672	.869	.916
CRI4	16.07	8.639	.861	.917
CRI5	16.07	8.819	.829	.923

Source: Processing data of the author

Result of Scale reliability of three independent variables showed, The credit Control before borrowing has Cranach's Alpha coefficient = 0.810 > 0.6 and Corrected Item-Total Correlation

of all variables are greater than 0.3; Cranach's Alpha of Credit Control in borrowing procedures = 0.853 > 0.6 and Corrected Item-Total Correlation of all variables are greater than 0.3; Cranach's Alpha of Credit Control after borrowing = 0.882 > 0.6 and Corrected Item-Total Correlation of all variables are greater than 0.3. Therefore, scale measurement for the credit Control before borrowing, in borrowing procedures and Control after borrowing has Cranach's Alpha coefficient factor is reliable for subsequent analysis.

Same as above, results of the reliability scale of the dependent variable show, the Credit Risk Management has Cranach's Alpha coefficient = 0.937 > 0.6 and Corrected Item-Total Correlation of all variables are greater than 0.3. Therefore, scale measurement for the Credit Risk Management has Cranach's Alpha coefficient is reliable for use in this study.

☐ **The result of Exploratory Factor Analysis (EFA)**

After analyzing Cranach's alpha for 3 independent variables and one dependent variable, we excluded 01 unsatisfactory variable, then continue to analyze EFA. The EFA uses the Principal Axis Factoring extraction method with a load factor ≥ 0.5 (Hair & Associates, 2006) for both the 17 variables. Bartlett's test examines the hypothesis of the correlation between observed variables. The results showed that the KMO = 0.880 (0.5< = KMO <=1); and Bartlett's Test statistic = 3475.978 Sig =0.00 < 0.05 (Table 4), it means that the application of exploratory factor analysis in the study is appropriate. Moreover, factors have the eigenvalue >1 which explains is greater than 50% (72.863%), the observed variables are grouped exactly as the initial scale (Table 5)

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.880
Bartlett's Test of Sphericity	Approx. Chi-Square	3475.978
	df	136
	Sig.	.000

Table 5. Pattern Matrix[a]

	Factor			
	1	2	3	4
CRI3	.963			
CRI1	.920			
CRI4	.842			
CRI2	.784			
CRI5	.744			
Af2		.931		
Af3		.799		
Af5		.732		
Af1		.719		
Af4		.639		
Befo4			.783	
Befo2			.720	
Befo1			.700	
Befo3			.650	

|				
Inpro2				.861
Inpro3				.811
Inpro1				.738
Initial Eigenvalues	**7.251**	**2.069**	**1.688**	**1.379**
% of Variance	**42.651**	**12.173**	**9.930**	**8.110**
Cumulative %	**42.651**	**54.824**	**64.753**	**72.863**

Source: Processing data of the author

Factor loadings are greater than 0.5, and the variables retained exactly as the groups in the original scale (Table 5). Thus, after the analysis of EFA, the model is not different from the proposed model; There are no new factor groups.

 Confirmatory factor analysis - CFA

The results of confirmatory factor analysis indicates that Chi-square = 263.041; df = 111 (p = 0.000 <0.05); Chi-square /df = 2.370 (df <3); TLI = 0.950; CFI = 0.959 (TLI, CFI > 0.9); GFI = 0.908 > 0.8 and RMSEA = 0.067 < 0.08. The result indicates that correlation coefficients are less than 1, covariance tests and correlations between paired variables are statistically significant (p-value <0.05, Table 6). This implies that the factors in the model can be distinguished. Therefore, it is possible to conclude that the model is compatible with market data (Figure 2).

Figure 2: Result of CFA testing (standardized)
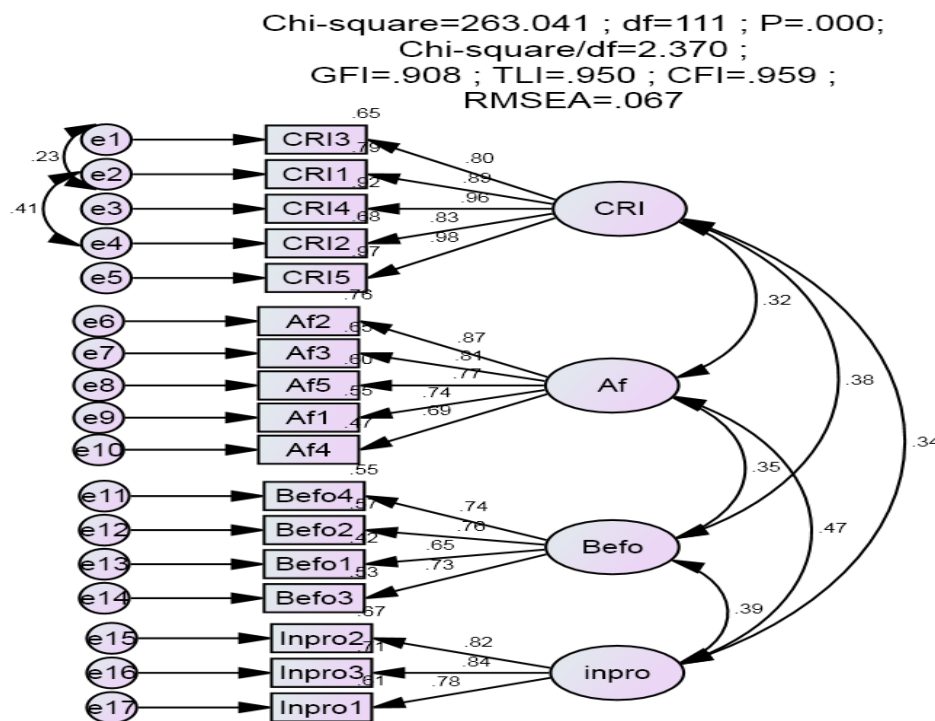
Source: Processing data of the author

Table 6. Covariance's of variables

			Estimate	S.E.	C.R.	P
CRI	<-->	Af	.150	.031	4.821	***
CRI	<-->	Befo	.172	.032	5.302	***
CRI	<-->	inpro	.175	.036	4.940	***

			Estimate	S.E.	C.R.	P
Af	<-->	Befo	.169	.036	4.744	***
Af	<-->	inpro	.266	.042	6.289	***
Befo	<-->	inpro	.211	.041	5.097	***
e1	<-->	e2	.046	.011	4.054	***
e2	<-->	e4	.082	.013	6.319	***

 Determine the significant differences on factors that influence the efficiency of credit risk management at Agribank branches

In this study, author use a linear structural model SEM to assess the relevance of the research model and test the relationships in the model. Results of SEM analysis with Chi-square = 263.041; df = 111 (p = 0.000 <0.05); Chi-square /df = 2.370 (df <3) ; TLI = 0.950; CFI = 0.959 (TLI, CFI > 0.9); GFI = 0.908> 0.8 and RMSEA = 0.067 < 0.08. Therefore, it is possible to conclude that the model achieves compatibility with market data (Figure 3)

Figure 3. The result of analyzing by SEM model (standardized)

Chi-square=263.041 ; df=111 ; P=.000;
Chi-square/df=2.370 ;
GFI=.908 ; TLI=.950 ; CFI=.959 ;
RMSEA=.067
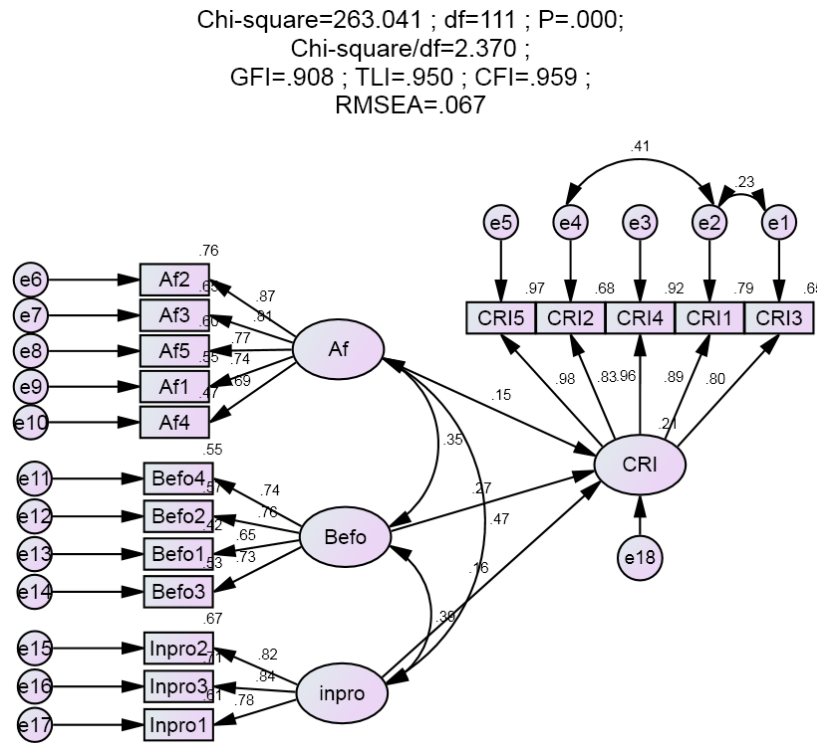
Source: Processing data of the author

 Results of Hypothesis Test

Table 7. Results of the hypothesis test (Hi)

Relation			Hypothesis	Estimate (standardized)	S.E.	C.R.	P	Results
CRI	<---	Befo	H1	.270	.066	3.918	***	Accepted
CRI	<---	Inpro	H2	.163	.058	2.320	.020	Accepted
CRI	<---	Af	H3	.147	.061	2.212	.027	Accepted

Source: Processing data of the author

Results of Hypothesis test shows the factors: Credit control before the bank's borrowers; Credit

control in borrowing procedures of the Bank; Credit control in borrowing procedures and Credit control after of the borrowers has a positive effect on the efficiency of credit risk management at agribank in Hanoi, Vietnam. In particular, the most influential factor in the effectiveness of credit risk management at Agribank branches in Hanoi, Vietnam is credit control before the bank's borrowers (with a coefficient of 0.270), followed by Credit control in borrowing procedures of the Bank (with a coefficient of 0,163) and finally is Credit control after of the procedures (with a coefficient of 0,147). Therefore, the hypotheses H1, H2, H3 are accepted (p-value <0.05) (Table 7).

CONCLUSION
Bank employees adhere to the actual control plan, on the software of the system after approval. Bank provides a course for putting data on the software of the system in whole Agribank system in each year, and update software system. Built a mechanism to check and monitor risk management activities necessary to ensure the independence, transparency, and continuity. Clear delineation of responsibility and have the inspection and supervision of the internal audit department and Board of Directors.

After loan disbursement, the bank staff directly check and compare the documents with the actual situation of using the capital of customers. For retail customers, it should be classified by category level, each group (pool) with similar risk-based applications (Behavior Scorecard) in the early warning system. Credit monitoring with corporate clients is based on regular follow - up and assessment of the business situation, financial capacity, the history of credit relations of customers as well as the evolution of the macroeconomic environment. For large projects, re-evaluation is required when the market fluctuates.

Credit employees are aware of early warning and timely credit shows signs of deterioration and proposed handling plans. Creating a level of loan warning for whole bank system and creating the scoring level of loan risk are required with the improvement of customer database quality and IT infrastructure to support the risk management department at the branch.
One of the problems posed for existence and sustainable development of commercial banks is the capacity to manage operational risk, especially credit risk. Credit risk in banking business is often difficult to control and if it happens, its consequences are unpredictable, as the extent of its influence may spread to all organizations in society, especially affecting operating macroeconomic policies of the government. Therefore, the identification of factors affecting the effectiveness of credit risk management at Agribank is very meaningful.

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