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Risk Management Affecting Green Credit Development: A Case Study of Commercial Banks in Vietnam

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ABSTRACT

Sustainable development with green growth is becoming a common trend in countries worldwide because green growth can simultaneously solve problems between growth and the environment - society, ensuring economic growth with environmental and social protection. By providing economic capital, the banking system is essential in implementing green growth by encouraging investments in environmentally friendly projects. Thus, this article aims to identify the key policy factors affecting the green credit development of commercial banks in Vietnam. The primary data is collected through focus group discussions with 25 experts and managers working in the banking sector and surveys of 400 staffs on green credit at 20 commercial banks. The article applied the qualitative and quantitative methods using structural equation modeling and SPSS 20.0, Amos software. The article explores five factors affecting green credit development with a significance level of 0.05, and five hypotheses are accepted. The article's novelty is determining the risk management factor that most substantially impacts green credit development. Finally, the article's contributions proposed vital policy recommendations for green credit development to create a foundation for green banking development.

INTRODUCTION

Pushing capital into the economy faster and more in the context of slow credit growth is the goal of many banks. Many solutions have been implemented, and one of them is to focus on green credit, a trend being approached by many banks to realize the Government's green economic development goals. Research papers with a green research orientation abound, ranging from those addressing wide-ranging topics such as the green economy and its various sectors and fields to more specific and technical issues such as technological solutions for specific industries, fields, activities, and green projects. The connection between sustainable agriculture and the green economy is also fundamental to this study (Aslam & Jawaid, 2023; Sadiq et al., 2022). In response to real demand, financial institutions worldwide use "green credit" strategies to guarantee that their development projects do not deplete local populations' natural resources or disrupt the delicate balance of the environment.

According to research, there are often three main approaches used by papers on green growth, green credit, or green credit development: (1) green growth on a global scale and the processes by which it occurs. To raise funds for environmentally friendly projects and programs, we need to understand (1) how the banking and financial sectors can help and (2) what steps to take to establish green credit organizations and trust funds (Chen et al., 2022; Peng et al., 2018). In addition, energy efficiency, renewable power, and clean tech initiatives focusing on green growth and environmental preservation have been part of the green credit expansion trend for some time. Businesses, organizations, and individuals may benefit from green finance because it reduces the environmental and social consequences of production and daily living, which is crucial for long-term viability (Han et al., 2023; Li, 2022). The bank's bottom line and reputation are bolstered by the implementation of the Green Credit Program. Since the state can only cover a fraction of the costs, other research has shown that green development initiatives frequently struggle to raise necessary funds. Everything else is either equity capital or money raised through other means (Banga, 2019; Chen & Wu, 2015). Credit institutions (in terms of profit and reputation), as well as borrowing firms and society as a whole, stand to gain substantially from this property. Commercial banks should also focus on this functional sector, particularly concerning liquidity and the proactive infusion of capital (Jameel et al., 2020).

In Vietnam, green credit contributes to the implementation of policies for the green banking sector that aim for economic growth and environmental protection. According to data from the General Statistics Office, in 2022, the GDP of the agricultural sector will increase by 2.15%, contributing 5.11% to the growth rate of the entire economy. Adequate production and business models help farmers and businesses reduce production costs and improve their income. However, the banking sector still faces many challenges, such as shrinking production land area, insufficient attention to sustainable development, not thoroughly resolving residues in animal feed aquaculture, and using inorganic fertilizers and chemical plant protection drugs. Vietnam's credit must develop in a green and sustainable direction to improve this situation and join the general trend worldwide. Accordingly, the industry needs a system of synchronous solutions, developing ecological agriculture in the direction of multi-value, multi-sector, integrating economic, social, and environmental values... Additionally, taking advantage of the natural benefits of regions for green banking development ensures interaction with the ecological environment.

1. LITERATURE EMPIRICAL REVIEW

1.1 Green credit development (ED)

Green credit: Another definition of green credit is refusing to provide funding for initiatives with adverse effects on the environment. In other words, green credit refers to the funding that financial institutions are willing to extend to commercial and industrial endeavors as long as they do not endanger people or the planet. Thus, green credit is the money that banks give out for initiatives that are either environmentally safe or aim to safeguard the environment (Zhou et al., 2020; Migliorelli, 2021). Banks are more likely to provide "green credit" to projects that are environmentally friendly and that do not harm the planet. Credits that consider environmental impact and sustainable development are available in the form of capital grants, loans, and other types of credit.

Green credit development refers to loans made by financial institutions to meet consumption, investment, manufacturing, and business demands in a manner that does not harm the environment. These loans help safeguard the overall attitude of the ecosystem (Raberto et al., 2019; Hong et al., 2021). In addition, green credit can also be understood in many aspects, including (1) through credit policies and tools such as loan conditions, terms, interest rates, and loan amounts to support environmentally friendly green investment projects, reducing carbon emissions; (2) limiting, stopping granting, or even revoking credits granted to projects that violate regulations on ecological environment protection; and (3) The Bank monitors the use of loans for projects with environmental risks and minimizes those risks through credit policies (Ibe-enwo et al., 2019).

A component of a green economy, green credit, means that banks lend money to projects that are good for the environment rather than those that would harm it. In a roundabout way, banks may help the environment by offering green finance (Zuo, 2023). Whether or not a proposed environmental safeguard

project adheres to the criteria established by the lending institution or relevant authorities. Green credit provides preferential capital with low-interest rates for projects related to environmental protection, reducing greenhouse gas emissions, and unusual climate fluctuations toward a green and growing economy and green banks (Cui et al., 2018; Christophers, 2017; Banga, 2019). Therefore, green credit development is one solution that the financial industry can apply to deal with the world's environmental and social challenges through financial tools for green banks. Thus, green credit development means increasing the green credit balance in the structure of bank loan customers and developing more green credit products while improving the quality of green credit. Developing green credit helps to increase the proportion of outstanding green credit loans at banks.

1.2 Human resources (HR)

X1: Human resources: Green credit operations for green projects, as well as all other commercial banking activities, are based on human resources that play an integral role in strategic planning, program, and project establishment, business process building, and code of conduct development (Migliorelli, 2021). Operating the system; controlling the technological infrastructure; executing plans according to the prescribed process; interacting with colleagues; working with state agencies, partners, and customers; and maintaining the cash flows of green credit and other resources under the management responsibility of commercial banks are all responsible for this subject (Raberto et al., 2019; Peng et al., 2018). Commercial banks may enhance system efficiency, save costs, and reduce risks by using human resources, which are a rich source of innovative ideas and initiatives that contribute to the continuous improvement of green credit operations (Batrancea et al., 2020; Ben, 2018). Additionally, this element drives commercial banks to establish and maintain their brand and identity by gradually crystallizing corporate cultural values (Zhang et al., 2023). Therefore, H1 proposes the following hypothesis:

H1: Human resources positively affect green credit development.

1.3 Capital sources (CS)

X2: Capital sources: Strong financial capacity is essential to ensuring competitiveness in providing green credit capital for projects. A combination of factors, including substantial equity capital, a secure mobilization and lending structure, and competitive costs, allow commercial banks to finance major green projects, increase their market share in green credit, and compete with interest rate policies for green projects in agriculture (Hong et al., 2021; Bose et al., 2018). Furthermore, the banking sector faces several problems and obstacles due to profound economic integration, particularly with regard to capital sources for green lending (Chen et al., 2021; Sa, 2020). For the simple reason that commercial banks are required by global standards to have a capital adequacy ratio of 9% or above. Therefore, Hypothesis H2 proposes the following:

H2: Capital sources positively affect green credit development.

1.4 Risk management (RM)

X3: Risk management: Credit risk management is an essential process in the operations of financial institutions, particularly banks. This process includes assessing, measuring, and managing the risks associated with lending money and determining the ability of customers or borrowing partners to repay debt (Chen et al., 2021). Credit risk management helps organizations determine safe credit levels to ensure that partners can continue to operate stably in the future. Credit risk management also plays an essential role in protecting the interests of both banks and customers while ensuring the financial system's stability, including green credit (Liu & Wu, 2023; Chen et al., 2022). Promoting green credit growth and managing environmental and social risks in credit-granting activities are extremely necessary. Thus, H3 proposes the following hypothesis:

H3: Risk management positively affects green credit development.

1.5 Promote propaganda and raise awareness (RA)

X4: Promote propaganda and raise awareness: Promote the role of media to enhance understanding and raise awareness of the banking industry's social responsibility in environmental protection, climate change prevention, and in promoting green production, service, and consumption activities (Han et al., 2023). This propaganda study identifies specific target audiences as banks and customers related to green credit (Zhang et al., 2021; Zuo, 2023). In addition, work propaganda on green credit should be encouraged to raise awareness of the importance and role of green growth for all people, agencies, and organizations. Bank staff must also be regularly trained to improve their understanding of green credit and thereby better support customers (Christophers, 2017). Promote the rational development of green credit products using capital from banks or state project programs for green projects to minimize adverse environmental impacts (Xu & Li, 2020). In addition, commercial banks need to develop modern banking services to reduce cash circulation in the market, contributing to the development of green credit products to improve financial capacity by mobilizing resources from international financial institutions or foreign donors (Wang et al., 2022). Thus, Hypothesis H4 proposes the following:

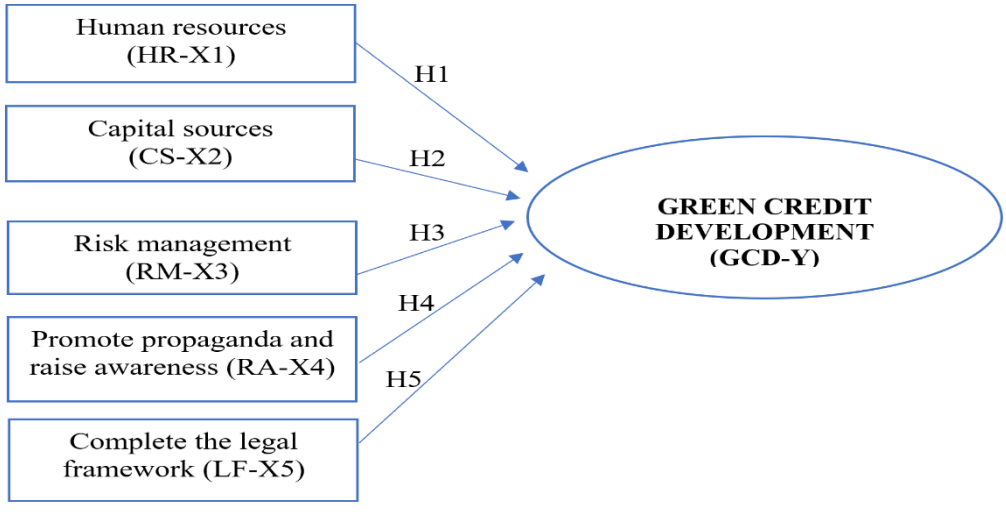
H4: Promoting propaganda and raising awareness positively affect green credit development.

1.6 Complete the legal framework (LF)

X5: Complete the legal framework: Specific regulations and definitions of green fields and categories have not yet been unified for general applications nationwide. Commercial banks find it difficult to choose, assess, analyze, and monitor green loans (Tawfik et al., 2021). However, the green industry lacks a legal framework for studying environmental impact measurement methods to support green credit programs and goods. Business strategies must also fulfill environmental and financial requirements (Cui et al., 2018; Gunawan et al., 2022). These regulations make clients unlikely to utilize a bank's green lending products without interest rate support or other incentives. The green credit policy covers all financing and lending approaches that reduce environmental impacts and improve sustainability (Chen & Wu, 2015; Derbali, 2021). Credit policies are designed to have objectives, orientation of credit activities, policies on the scale, credit limits, customers, interest rates and credit fees, and policies on insurance assets. Guarantees, credit terms, debt terms, and policies for problematic credits. Therefore, hypothesis H5 proposes the following:

H5: The complete legal framework positively affects green credit development.

Based on research results related to green credit, plus references to some theories on green credit development in some countries, the author proposed the form of a structural equation model:



Source: The author proposed

Figure 1. A research model for critical factors affecting the green credit development in Vietnam

Figure 1 showed that there are five factors including human resources (HR-X1), capital sources (CS-X2), risk management (RM-X3), promote propaganda and raise awareness (RA-X4), and complete the legal framework (LF-X5).

2. METHODOLOGY AND DATA

The data was surveyed by the author, and a detailed description of the research questionnaire to staffs working in commercial banks. The author explained the type of data that will be collected, and the methods used to anonymize and store it. Furthermore, all of the staffs have granted the author permission to utilize this data for research purposes and publishing in both local and international publications. Therefore, the precise details of the processes are as follows. The research process is carried out through the following steps:

First, qualitative methods are used to discover scientific laws, and there is no theoretical reference framework for factors affecting the development of green credit and sustainable agriculture; therefore, it is necessary to conduct qualitative research to confirm the factors influencing the development of green credit. Theory and analysis of current state of research, expert opinions were collected to check the appropriateness of the concepts and the relationships between them. In addition, the topic was expanded using open questions to gather additional information. Survey results of 25 experts and managers working in the banking sector. The results show that 25 experts and managers agree with the five factors affecting green credit development (Hair et al., 2018).

Secondly, the author analyzes the reliability of the data through the Cronbach'Alpha coefficient, then analyzes the exploratory factors by the EFA method to refine the scale and determine the scale structure for official research. Finally, the author conducts formal research to evaluate the scale, test the model, and research hypotheses. The official analysis was conducted through a survey with an expected sample size n = 400 staffs at 20 commercial banks, and then data were analyzed to test the research hypotheses. Data collection subjects included unit heads, deputy heads, middle managers, and long-time employees working in credit lending, including green credit, with cost limitations. Time, non-probability, and convenience sampling, combined with sample development, are appropriate.

Furthermore, non-probability sampling is often used to evaluate factors in preliminary exploratory studies. The survey period is from January 2023 to June 2023, and the data are processed. After verifying the scale's reliability and analyzing the factors, the author used a structural linear regression model (SEM) to test the model and research hypothesis (Hair et al., 2018).

Thirdly, research sample size: To ensure representativeness and reliability for the sample and EFA analysis, at least 5 samples are required for each observed variable. Therefore, with 24 observed variables, the sample size should be at least 24 x 5 = 120 samples. The survey results were analyzed using the techniques of SPSS and AMOS software. The author conducts Cronbach's alpha reliability analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation model (SEM) to see the influence of the variables.

Finally, the author designed all questions in part of the questionnaire arranged on a scale of 1 to 5 (5-point Likert scale), showing the increasing level of agreement of the respondents to the issue of the author's green credit interview. The specific meanings are as follows: (1) disagree entirely. (2) Disagree. (3) Normal. (4) Agree. (5) agree entirely (Hair et al., 2018). The sampling method is convenient and mailed to each individual, but 375 samples were processed. Finally, the author discusses the results and policy recommendations for green credit development in Vietnam.

3. EMPIRICAL RESULTS

3.1 Analysis of descriptive statistics, Cronbach's alpha, and confirmatory factor analysis for factors affecting the green credit development in Vietnam

Table 1. Testing descriptive statistics and Cronbach's alpha for critical factors affecting green credit development in Vietnam

Code	*Items*	*Cronbach's alpha*	*Mean*	*Std. Deviation*
Human resources (HR)		*0.920*	*3.077*	-
HR1	Banks need to plan human resources	0.891	3.0747	1.01052
HR2	Banks need to have policies to attract human resources	0.895	3.0827	0.98713
HR3	Arranges and uses human resources effectively	0.890	3.1333	0.94123
HR4	Regularly train and develop green credit human resources	0.909	3.0187	1.01969
Capital sources (CS)		*0.840*	*3.472*	-
CS1	The bank needs to increase equity capital	0.787	3.5093	0.85861
CS2	Improve credit quality	0.784	3.5547	0.89656
CS3	Diversify banking products and services	0.831	3.3627	0.93745
CS4	Banks need to ensure good liquidity	0.785	3.4613	0.88841
Risk management (RM)		*0.927*	*3.058*	-
RM1	Building a green credit risk management apparatus	0.903	3.0347	0.97090
RM2	Complete the credit information database system	0.918	3.0453	0.99763
RM3	Apply digital technology to enhance risk management capacity	0.891	3.1067	0.93896
RM4	Build and perfect a risk management culture	0.908	3.0480	0.96895
Promote propaganda and raise awareness (RA)		*0.934*	*3.021*	-
RA1	Strengthening propaganda and dissemination activities about green credit to credit institutions	0.906	3.0107	0.96732
RA2	businesses and people through communication channels,	0.917	2.9813	1.00116
RA3	Having seminars training for green credit	0.925	3.0853	0.93258
RA4	Improving the capacity of officers and employees of green credit appraising	0.908	3.0080	1.03026
Complete the legal framework (LF)		*0.813*	*2.415*	-
LF1	Detailed and clear regulations on green credit	0.767	2.3573	0.68622
LF2	Policies to encourage green credit	0.738	2.4213	0.62358
LF3	Long-term capital sources, green credit incentives	0.805	2.4213	0.68097
LF4	Establishment of green credit fund	0.747	2.4640	0.69618
Green credit development (GCD)		*0.777*	*3.282*	-
GCD1	Gradually increase the proportion of green credit	0.643	3.4720	0.93571
GCD2	Green field lending support policy	0.677	3.2507	1.01122
GCD3	Complete the legal framework for green credit development	0.775	3.1253	1.04844

Source: Data processed from SPSS 20.0

Table 1 shows that Cronbach's alpha for various factors affecting the green credit development of commercial banks in Vietnam is higher than 0.7. Five factors include human resources (HR-X1), capital sources (CS-X2), risk management (RM-X3), promote propaganda and raise awareness (RA-X4), and complete the legal framework (LF-X5). Besides, one dependent variable shows green credit development (GCD-Y). Overall, the research model's appropriateness was assessed by examining the reliability and convergence value indexes and the discriminant value of the scale system utilized in this study. The results

confirmed that the research model aligns well with the survey data. Simultaneously, the notions may be effectively used in the ensuing analysis.

Table 2. Testing confirmatory factor analysis for factors affecting the green credit development

Indicators	*CR*	*EVA*	*MSV*	*Results*
RM	0.916	0.663	0.073	Good
HR	0.935	0.873	0.364	Good
CS	0.943	0.883	0.045	Good
RA	0.923	0.862	0.073	Good
LF	0.946	0.823	0.026	Good
GCD	0.876	0.665	0.308	Good

Source: Authors collected and processed from SPSS 20.0, Amos

Table 2 shows that all CR outputs are more significant than 0.7, so the overall reliability of this scale is good and acceptable. All average variance extracted (AVE) value is more significant than 0.5. To ensure the convergence of the scales, the AVE must be >= 0.5. The results of CFA analysis show that the AVE value corresponding to the factors ranges from 0.663 to 0.883, therefore satisfying the requirement of convergence, and the maximum shared variance (MSV) is smaller than EVA to ensure the discriminant.

3.2 Testing critical factors affecting the green credit development

Table 3. Testing critical factors affecting the green credit development

Relationships			*Standardized estimate*	*S.E*	*C.R*	*P*	*Result*
GCD	<---	RM	0.518	0.048	7.944	0.0001	Accepted
GCD	<---	HR	0.116	0.023	2.639	0.008	Accepted
GCD	<---	CS	0.151	0.047	2.834	0.005	Accepted
GCD	<---	RA	0.132	0.041	2.990	0.003	Accepted
GCD	<---	LF	0.083	0.064	3.263	0.001	Accepted

Source: Data processed from SPSS 20.0, Amos

Table 3 shows five factors affecting the green credit development in Vietnam, with a significance level of 0.01. The article's novelty is finding out the risk management (RM) that has the most substantial impact on green credit development in Vietnam, with a standardized estimate of 0.518. This is the most influential factor and also the priority for policy implementation.

Table 4. Testing Bootstrap 30.000 samples for factors affecting the green credit development

Parameter			*SE*	*SE-SE*	*Mean*	*Bias*	*SE-Bias*	*CR*
GCD	<---	RM	0.066	0.001	0.374	0.003	0.002	1.50
GCD	<---	HR	0.023	0.001	0.063	0.002	0.001	2.00
GCD	<---	CS	0.064	0.001	0.136	0.003	0.002	1.50
GCD	<---	RA	0.052	0.001	0.126	0.003	0.002	1.50
GCD	<---	LF	0.093	0.002	0.185	0.005	0.003	1.67

Source: Author collected and processed from SPSS 20.0, Amos

Table 4 shows that testing Bootstrap with 30.000 samples for factors affecting the green credit development in Vietnam, with a significance level of 0.01. The Bootstrap technique was executed with N = 30,000 repeated instances. The average of estimates from N samples tends to closely approximate the population estimate. The closer the mean calculated by Bootstrap is to the model estimate using the original sample, the more confidence we may have in the reliability of the model estimations.

3.3 Result discussion

In realizing Vietnam's green goals, green credit, and banks play an essential role in motivating and supporting the banking sector to develop sustainably without harming the environment. Based on SEM testing, five key factors affected green credit development, with sig. 0.01. Five components need to be considered: X1: Human resources; X2: Capital sources; X3: Risk management; X4: Promote propaganda and raise awareness; X5: Complete the legal framework, which includes the following discussions synchronously implemented:

Firstly, X1: Human resources: This factor affects green credit development at a significance level of 0.01. Green credit development is positively affected by human resources; as this illustrates, there are the same results of studies (Migliorelli, 2021; Wang et al., 2018; Zhou et al., 2020). Consequently, commercial banks must also ensure that their staff of sellers and customer relations professionals receive professional training. To accommodate students' varying demands in terms of background information, available time, and physical location, commercial banks should prioritize training that takes a multimodal approach with a focus on online and remote learning. Growth in the field of human resources has been and will continue to be an ever-present necessity. Human resources are one of the most critical issues for banks and businesses, helping organizations maintain a competitive position in the market. The globalization process is vital, and improving human resources is necessary.

Secondly, X2: Capital sources: This factor affects green credit development at a significance level of 0.01, which is consistent with the results of previous studies (Chen et al., 2021; Sadiq et al., 2022). As a result, commercial banks in Vietnam need to raise their capital reserves shortly to address risks, comply with safety framework capital requirements, and remain competitive with international and joint venture banks. Make sure that loan money is recovered on schedule and credit standards are followed. Strictly inspect investment projects and ensure profit regulation before investing. Therefore, commercial banks need to shift their credit activities toward greening, which positively impacts the economy's sustainable development but is also meaningful for the economy's social and environmental issues. In the context of the Covid-19 pandemic over the past three years, the global supply chain has been disrupted and the market prices of many raw materials, such as oil, gas, and coal, have increased sharply.

Thirdly, X3: Risk management: This factor affects green credit development with a significance level of 0.01, and the same results have been reported (Batrancea et al., 2020; Tawfik et al., 2021). This provides the necessary scientific groundwork for commercial banks and state-run financial institutions to create and disseminate indicators for assessing social and environmental hazards in high-risk economic areas. The paperwork and processes that consumers find bothersome have been streamlined by the use of unified transaction processes. When processes are followed correctly, tasks are completed efficiently and with high uniformity. This allows for easy detection and correction of errors, reducing the likelihood that they will occur. Financial institutions must investigate the potential dangers by identifying their origins. Determining the origin of risk, likelihood of harm, and possible gains from hazardous banking activities are the most important aspects of this employment.

Fourthly, X4: Promote propaganda and raise awareness: This factor affects the development of green credit with a significance level of 0.01, and the same results have been reported (Zhang et al., 2021; Zuo, 2023). Green credit development has great significance, not only as a driving force for green economic growth and green agricultural development but also for preventing, combating, and limiting negative impacts caused by climate change and protecting nature and the human living environment. Accordingly, in addition to policy mechanisms and human resources, raising awareness of green credit plays an important role. Identifying the factors affecting green credit development as a solution for green growth is necessary and meaningful in promoting sustainable development. Improving communication, information,

and implementation elements. This is also an important factor that has become essential in expanding and developing green credit and the economy. Through this activity, be aware of the role and objective inevitable development trend of green credit and green economy, as well as identify the factors affecting green credit and the nature of green credit... help credit institutions exploit and use capital effectively, best meet capital needs for green projects, for businesses to implement green production and business plans, protect the environment.

Finally, X5: Complete the legal framework: This factor affects green credit development at a significance level of 0.01, and the same results have been reported (Xu & Li, 2020; Wang et al., 2022; Liu & Wu, 2023). State banks' policy mechanisms are increasingly improving and creating conditions for green credit expansion and growth. From a management perspective, the guidelines and policies of the State Bank have encouraged credit institutions to actively participate in lending to green projects, developing green credit, and green banking in the overall industry development strategy associated with the Government's green economy development with specific directives, instructions, programs, and action plans. From a professional perspective, green credit is not very different from conventional credit in terms of the nature of credit. If there is any difference, it is mainly the distinction associated with classifying credit balances according to the purpose of projects and loan plans: green production, business projects, and conventional production and business projects. This distinction is based on the characteristics and requirements of green economic activity.

CONCLUSIONS

In recent years, climate change, natural resource depletion, and environmental pollution have significantly impacted the stability of the human living environment, posing concerns for governments. Furthermore, with the continuous advancement of civilization, the environmental impact of individuals' lifestyles and enterprises' production operations is becoming increasingly detrimental. Consequently, there has been a growing focus on the concept of green credit development. Green credit development has become widespread and firmly established in banks and credit institutions. This facilitates the augmentation of capital flows and acquisition of abundant investment capital for many sectors of societal existence, encompassing environmentally sustainable agriculture. The results obtained from this study clearly indicate five factors that affect green credit development with sig. 0.01. Descriptive statistical tools were used to measure the mean value, standard deviation, and structural equation modeling. Moreover, the study's contributions help policymakers and bank managers apply the research results to enhance green credit development. Based on the research results, to cope with the above challenges, it is necessary to implement several solutions synchronously:

First of all, improve risk management, this factor has an average value of 3.058 and a standardized estimate of 0.518 with sig. 0.01 (Table 1 & 3). The State Bank of Vietnam recently drafted a circular to guide the implementation of environmental risk management in credit-granting activities. This move is part of their commitment to promoting green credit growth and achieving development goals. A unified legislative framework mandating that credit institutions use environmental risk management in their loan-giving operations is being sought after by credit institutions and overseas bank branches. As a result, financial institutions are required to communicate with the State Bank and draft internal policies for the management of environmental risks in the context of loan provision. Vietnam now has a standardized legislative framework for environmentally responsible financing thanks to this initiative.

Secondly, improve capital source, this factor had an average value of 3.472, and the standardized estimate was 0.151 with sig. 0.01 (Table 1 & 3). The State Bank can promote green credit growth by implementing preferential policies for commercial banks implementing green credit in the following ways: reducing the required reserve ratio for capital banks to mobilize. Project lending activities, refinancing incentives, and rediscounting for green credit are consistent with monetary policy objectives and measures. These loans are given priority in terms of terms and capital source loans compared with other sectors. Additionally, green credit capital sources are often investments with large capital scales and slow recovery times. Meanwhile, small and medium-sized enterprises in our country approach projects with low equity capital and little collateral, which is not large enough. Therefore, increasing mobilized capital is

essential. In addition, the bank itself should increase green capital by coordinating with funds, such as the Environmental Protection Fund Green Credit Trust Fund, or by cooperating with other banks to grant green credit to big projects.

Thirdly, improve propaganda and raise awareness, this factor has an average value of 3.021 and a standardized estimate of 0.132 for sig. 0.01 (Table 1 & 3). To lessen the negative effects on the environment, it is recommended that green credit products be developed in a reasonable manner by utilizing funds allocated by state project programs or banks. Furthermore, commercial banks could enhance their banking services to decrease the market cash circulation, which would aid in the creation of environmentally friendly credit products. Raise capital by enlisting the help of overseas donors or financial organizations. Manage social and environmental risks and implement a green credit policy through information and communication efforts. Financial solutions, green banking, and green credit products are still in their infancy and have not yet been extensively distributed; credit institutions are still in their early phases of implementing green credit operations. It remains unclear how companies perceive or are aware of this action.

Fourthly, improve human resources, this factor had an average value of 3.077; the standardized estimate was 0.116 with sig. 0.01 (Table 1 & 3). Commercial banks must strengthen their human resources to promote green credit growth. The professional quality of officers in charge of green credit-granting activities is essential in promoting this credit line's development. First, it is necessary to organize, train, and strengthen the capacity of credit institutions and individuals participating in building and implementing policy mechanisms for green credit products to improve the banking system's capability to implement green credit. Secondly, credit officers need to enhance their professional qualifications and be carefully selected in all aspects, from professional ethics to experience and professional qualifications. To ensure credit safety and minimize risks, officers in charge of green credit must have high professional qualifications, good ethics, an understanding of the market, and an understanding of the laws and regulations.

Finally, improve complete the legal framework, this factor had an average value of 2.415, and the standardized estimate was 0.083 with sig. 0.01 (Table 1 & 3). Government and management agencies at all levels need to make support commitments so that the banking system has favorable conditions to provide green credit through reduced access to capital for polluting projects with high pollution and to encourage capital flows toward environmental projects. Adjust the economic structure from industries with high labor content to industries with high capital and technology content, thereby promoting increased international economic integration. In addition, it promotes consensus and commitment to participation from the local authorities at all levels. Because green projects are spread across the country and are located in our country's topographic conditions, the management and supervision of compliance with environmental protection regulations and the provision of complete, public, and transparent information about individuals and organizations violating legal regulations on environmental protection is an important task that requires timely support from local authorities.

Limitations and future research: The study employed a mixed-methods approach, with the author administering both random and convenience questionnaires to a very small sample size of 20 commercial banks in Ho Chi Minh City, Vietnam. This might potentially impact the research findings, leading to a decrease in data precision. Hence, future studies should encompass a broader range of regions in Vietnam and incorporate more variables that influence the development of green credit.

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