Factors Affecting Green Credit Development at Commercial Banks in Vietnam

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Abstract

In recent years, climate change, depletion of natural resources, and environmental pollution have affected the stability of the human living environment and are issues that concern most countries worldwide. Besides, some commercial banks have only been initially interested in implementing green credit because the benefits of becoming a green bank are unclear. Thus, the study's goal applied the scale for preliminary evaluation according to the study's data through the reliability of Cronbach's alpha and Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM). The formal research was conducted quantitatively through interviews with a sample size of 1050 bank officers and employees. The article has completed the study objectives set out and evaluated the structural model results showing that all eight factors positively influence the development of green credit. Eight factors include (1) Support policy, (2) Financial capacity, (3) Marketing strategy, (4) Banking technology, (5) Quality of human resources, (6) Management of risk, (7) Legal framework, and (8) Environmental policy at the 5% significance level.

Discipline: Commercial Banking.

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1 Introduction

A green environment is becoming an important top goal when worldwide are calling for environmental protection towards sustainable development. Countries are pursuing a green revolution, whereby the development of economic sectors is only encouraged when it does not cause adverse environmental consequences. In that process, greening the system of financial institutions plays a critical role because this is the primary source of funding for investment and development of projects in all economic sectors (Aizawa & Yang, 2010; Derbali, 2021).

Green credit is a bridge between businesses and the market from two angles. First, capital is a fundamental and essential input factor of production and trade. When their own capital is not enough to operate, businesses have to look to other sources of capital. Commercial banks will help enterprises to solve with green credit capital. Thus, commercial banks are the bridge to bring businesses to the market utilizing

green credit. Second, commercial banks act as payment intermediaries between companies, partners, and customers. Thus, commercial banks help businesses and markets closer in space and time (Jameel et al., 2020; Duan & Niu, 2011).

The impact of climate change in Vietnam seriously threatens the progress of poverty reduction, the achievement of the Millennium Development Goals, and the country's sustainable development. In recent years, Vietnam has been considered one of the countries most affected by climate change. Currently, enterprises experiencing losses and damages in their production and business activities cause them to suffer financial losses, the risk of losing reputation, reducing competitiveness... risks from environmental and social problems are increasing. Therefore, studying the factors affecting green credit development at commercial banks in Vietnam is necessary.

2 Literature Review

2.1 Green Credit Development (PTTDX)

Green credit development is a credit that a bank grants to projects with low environmental risks or environmental protection projects. In other words, green credits are forms of financing such as grants, loans, and additional credit granting methods, in which environmental impacts and conservation are considered (Chao et al., 2021; Chen, 2019).

Green credit also means refusing to grant credit to projects that harm the environment. More simply, green credit is credit that a bank contributes to production and business projects without risk or for environmental and social protection. Therefore, green credit banks lend to projects that do not pose risks to the environment or projects with environmental protection goals.

Green credit development is credited banks grant to projects that do not pose risks or protect the environment. In other words, credits are capital financing, loans, and other forms of credit. Other credit facilities consider environmental impact and promote environmental sustainability (Christophers, 2017; Koju et al., 2018).

The atmosphere is an essential contributor to the sustainable development of the economy. Green credit is the grant of credit in the form of financing, loans, and other forms of credit, taking into account the project's impact and the loan option on the environment by protecting the environment. The trend of green credit has long developed in the world with energy saving, renewable energy, and clean technology projects aiming at the "dual" goal of economic growth associated with environmental protection (Ogutu & Fatoki, 2019).

2.2 Factors Affecting Green Credit Development at Commercial Banks

The authors base the research mentioned above as essential references for the study to inherit, develop and supplement to complete the theoretical basis for green credit development in commercial banks. as well as study this content on a national scale as follows eight factors include (1) Support policy, (2) Financial capacity, (3) Marketing strategy, (4) Banking technology, (5) Quality of human resources, (6) Management of risk, (7) Legal framework, and (8) Environmental policy. The authors synthesize factors with frequency to include in the research model.

Support policy (CSHT): Green credit is one of the green financial tools to finance green and environmentally friendly programs, projects, and initiatives, to encourage consumers and businesses to optimize and regenerate energy sources concerned about environmental issues. In particular, green credits often finance initiatives and projects that are expected to have a clear and positive impact on the environment, so they often have preferential interest rates and longer payment terms than other projects with regular loans.

It can be said that green projects are considered priority areas for loans (Peng et al., 2018; Nanda & Bihari, 2012).

Financial capacity (NLTC): In the context of deep integration into the world economy poses many difficulties and challenges for the banking system, primarily commercial banks. Because according to international practice, the capital adequacy ratio (CAR) of commercial banks must be 9% or more; if this ratio is not guaranteed, commercial banks will not be able to expand operations, even in danger of bankruptcy. Therefore, improving financial capacity will help commercial banks implement risk prevention measures, ensure capital safety in operations, and minimize possible damage to retail customers (Raad, 2015; Miroshnichenko & Mostovaya, 2019).

Marketing strategy (CLMK): In essence, banks, like businesses, must also have capital, revenue, purchase, and sale... Banking marketing is a system and process of banks trying to implement solutions to satisfy customers' needs and proactively wants to meet the needs and desires of the bank. However, the bank's activities are mainly monetary business and other services. In the era of technology 4.0, implementing marketing solutions for banks is even more focused (Rahaman et al., 2018; Sa, 2020).

Banking technology (CNNH): Investment in developing the bank's information technology system is also critical, especially when there is a sufficient basis for assessing and quantifying green credit risks in the future. Commercial banks build data banks on green credit risks and use modern risk analysis and handling tools. This factor significantly affects the quality and effectiveness of bank governance, including risk management in general (Lili, 2015).

Quality of human resources (CLNNL): People are the central factor for the bank's business activities to be more and more expanded. It is necessary to have a team of enthusiastic and highly responsible bank staff with professional knowledge. Therefore, human resource solutions play a crucial role. The quality of human resources of the banking system mentioned in the study is the level of human resource capacity to meet the requirements of the banking system development strategy, especially credit development green. Human resources, especially high-quality human resources, play a decisive role in the socio-economic development of each country (Bracking, 2015).

Management of risk (QTRR): Risk management at banks by 2025 will be very different from the present time. These differences may come from state management agencies changing regulations and policies in banking operations, from customers having higher expectations for product sales and interaction channels, or because risk types vary in a more complex direction. Therefore, the bank must always be ready to change itself to promptly meet the requirements and expectations of customers, partners, state management agencies, and other stakeholders in the long term to contribute to the future to improve the quality of green credit (Banga, 2019).

Legal framework (KPL): Green credit is an inevitable trend in the global financial industry, an effective solution in preventing and limiting the increasingly adverse impacts of climate change. For Vietnam, green credit plays a critical role in promoting sustainable development and realizing the Government's green growth strategy. Accordingly, the target of the banking industry by 2025 is that 100% of banks have developed internal environmental and social risk management regulations in credit granting activities; 100% of banks carry out a social and ecological risk assessment in credit granting activities (Beck et al., 2006; Mengze & Wei, 2013).

Environmental policy (CSMT): Environmental protection has been paid great attention to by our Party and State and is a cross-cutting point in leading the country. In the context of paying attention to green economic development. The system of policies and laws on the environment is still overlapping and inadequate; environmental management tools have not been effective and efficient; New management

approaches and tools have not been institutionalized on time and cannot keep up with the rapid developments of environmental issues and the country's requirements for socio-economic development and international integration (Bing et al., 2011).

2.3 The Research Model

The authors propose a model of factors affecting the green credit development of commercial banks in Vietnam as follows:
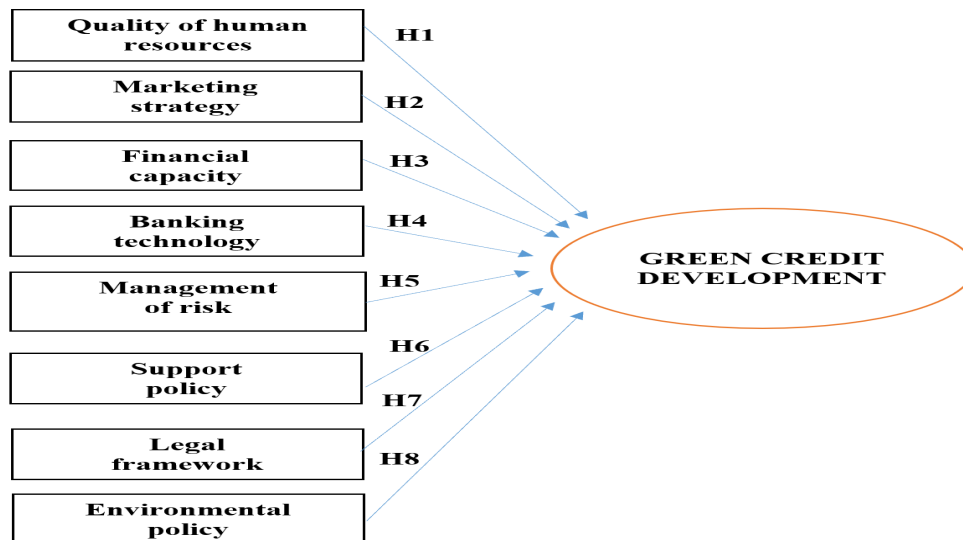

Figure 1: Factors affecting the green credit development of commercial banks in Vietnam

3 Method

The study applied mixed methods, including qualitative and quantitative in preliminary research and quantitative in a formal investigation, with the data source used as primary data source obtained through a questionnaire survey. Sequential research method through two main approaches as follows:

With a qualitative research method, the target groups of 30 managers of the 15 largest commercial banks in Vietnam were invited to participate in a face-to-face group discussion to explore the elements of the green credit development scale. In addition, the author studies the theoretical basis to develop a research model and design a scale to calibrate the model and scale following the research context.

Specifically, the author consulted with 30 managers in the banking sector regarding banking credit activities, including deputy heads of branches, transaction offices, and leaders of credit departments. Based on the opinions of 30 managers knowledgeable about management in the banking sector related to banking credit activities, the author has identified precisely what information to collect from the managers' comments and from that form the survey.

The detailed steps in qualitative research are as follows: (1) Collect and synthesize theories related to the research topic. (2) Design preliminary questions through the opinions of 30 managers in the banking sector related to banking credit activities. (3) Conduct trial interviews with officers, credit officers, and managers and adjust the questions. (4) Conduct test interviews and run samples of about 400 survey questionnaires from officials and employees from commercial banks to verify the scale. (5) Develop a formal survey for the research topic with 1,050 surveyed officers and employees. The author delves into each commercial bank's survey with 70 representatives and employees participating in answering to test the research model and hypothesis. The face-to-face interview technique was also applied with a revised questionnaire after preliminary qualitative and quantitative research (Hair et al., 2010).

Quantitative research methods: The study uses a convenient and simple sampling method. The data collected from the survey was used by the author using SPSS 20.0 software, Amos, and the reliability of the

scales was tested using Cronbach's Alpha reliability coefficient, exploratory factor analysis (EFA), analysis confirmatory factor analysis, and test multivariable linear regression model.

The research process had the following steps: (1) the first step of formal research is also applied in the form of interviews with 1,050 respondents to test the research model and hypothesis from which to process the questionnaire, using SPSS 20.0 software, and Amos (2) Descriptive statistics of variables. (3) Test the scale through Cronbach's Alpha coefficient to determine the reliability. (4) Exploratory factor analysis (EFA). (5) Confirmatory factor analysis (CFA). (6) Analysis of multivariable linear regression model. (7) Check the model's assumption violations (Hair et al., 2010).

4 Result and Discussion

In Vietnam, recognizing the importance of green credit, in March 2015, the State Bank of Vietnam (SBV) issued Directive No. 03/CT-NHNN on promoting green credit growth and risk management of environmental and social risks in credit granting activities. The SBV also issued the Banking Sector Action Plan to implement the National Green Growth Strategy to 2020 with solutions such as: Strengthening the capacity of the banking system in implementing green banking credit, accelerating the implementation of green credit-banking products, supporting enterprises to implement green growth; strengthen propaganda and dissemination on banking activities, including green credit.

According to the SBV's regulations, green credits are capital-funded projects that meet specific criteria for green agriculture, sustainable forestry, green industry, renewable energy, energy clean, recycling, use of resources, waste treatment and pollution prevention, protection of the natural environment, green construction, sustainable transportation. The following are the survey results in table 1.

Table 1: Descriptive statistics for the green credit development of commercial banks

Contents	Code	N	Min	Max	Mean	Std. Deviation
Banks need to gradually increase the proportion of green credit for the purpose of sustainable development	PTTDX1	960	1.00	5.00	3.4323	0.93679
The State Bank should have a clear support policy for banks that lend to the green sector	PTTDX2	960	1.00	5.00	3.3813	0.94723
The State Bank needs to continue to improve the legal framework for green credit development	PTTDX3	960	1.00	5.00	3.3406	0.96747

Table 1 shows the number of 1,050 surveyed officers and employees, but 960 samples were processed, with the lowest answer being 1.0 and the highest being 5.0. The mean between the variables is around 3.0 and is less than 1.0 apart. The standard deviation of the data is approximately 1.0, and there is not much difference between the variables.

Table 2: Testing the SEM model results

The relationship between the factors			Standardized Estimate	Estimate	S.E.	C.R.	P	Results
PTTDX	<---	CSHT	0.160	0.094	0.046	3.496	***	Accepted
PTTDX	<---	NLTC	0.526	0.545	0.027	19.336	***	Accepted
PTTDX	<---	CLMK	0.079	0.084	0.027	2.986	0.003	Accepted
PTTDX	<---	CNNH	0.069	0.075	0.024	2.829	0.005	Accepted
PTTDX	<---	CLNNL	0.208	0.087	0.045	4.617	***	Accepted
PTTDX	<---	QTRR	0.153	0.148	0.030	5.107	***	Accepted
PTTDX	<---	KPL	0.081	0.068	0.029	2.748	0.006	Accepted
PTTDX	<---	CSMT	0.068	0.079	0.022	3.111	0.002	Accepted

Table 2 shows that the regression weights and test hypotheses include eight factors that affect green credit development at the statistical significance level of < 5%. The price column P with a *** sign represents a less than 1% significance level. Thus, eight factors affecting the development of green credit include (1) Supporting Policy (CSHT), (2) Financial capacity (NLTC), (3) Marketing Strategy (CLMK), (4) Banking technology (CNNH), (5) Quality of human resources (CLNNL), (6) Risk management (QTRR), (7) Legal framework (KPL) and (8) Environmental policy (CSMT).

Table 2 results show that the supportive policy has an unnormalized estimate of 0.160; it has a positive sign and the significance level is 0.000. This indicates that the support policy increased by 1 unit, and the average increase in green credit development is 0.160 units. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

Table 2 results show that financial capacity has an unstandardized estimate of 0.526; it has a positive sign and the significance level is 0.000. This indicates that financial capacity increased by 1 unit, and the average green credit development increased by 0.526 units. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

The results of table 2 show that the Marketing strategy has an unnormalized estimation coefficient of 0.079, a positive sign, and a significance level of 0.003. This indicates that the Marketing strategy increased by 1 unit, and the green credit development increased by an average of 0.0790 units. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

The results of table 2 show that banking technology has an unnormalized estimation coefficient of 0.069; it has a positive sign and the significance level is 0.005. This means a 1 unit increase in banking technology, an average increase of 0.069 units in green credit development. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

The results of table 2 show that the quality of human resources has an unstandardized estimate of 0.208; it has a positive sign and the significance level is 0.000. This indicates that if the quality of human resources increases by 1 unit, the average green credit development will increase by 0.208 units. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

The results of table 2 show that risk management has an unnormalized estimate of 0.153; it has a positive sign and the significance level is 0.000. This indicates that risk management increased by 1 unit, and green credit development increased by 0.153 units on average. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

The results of table 2 show that the legal framework has an unnormalized estimation coefficient of 0.081, a positive sign, and a significance level of 0.006. This means that the legal framework factor increases by 1 unit, and the average green credit development increases by 0.081 units. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

The results of table 2 show that the environmental policy has an unstandardized estimate of 0.068; it has a positive sign and the significance level is 0.002. This means that the environmental policy factor increases by 1 unit, and the average green credit development increases by 0.068 units. Provided other factors remain constant. Thereby, it positively impacts green credit development in Vietnamese commercial banks.

Thus, the SBV needs to issue mandatory environmental and social risk management regulations to develop green credit and provide guidance, policy support, human resource training, and propaganda. In addition, commercial banks must also actively develop green credit policies, find funding sources to research and deploy green credit products, and seriously carry out an environmental and social risk assessment. When

granting credit, at the same time, the bank must also raise the awareness and qualifications of credit officers and employees about green credit

5 Conclusion

In recent years, climate change, depletion of natural resources, and environmental pollution have affected the stability of the human living environment and are issues that concern most countries worldwide. Society is increasingly developing, people's lives and the production activities of enterprises are negatively impacting the environment, and green credit is gradually receiving more attention. The trend of green credit has been viral and firmly applied at banks. Besides, the formal research was conducted quantitatively through interviews with a sample size of 1050 bank officers and employees. The article has completed the study objectives set out and evaluated the structural model results showing that all eight factors positively influence the development of green credit. Eight factors include (1) Support policy, (2) Financial capacity, (3) Marketing strategy, (4) Banking technology, (5) Quality of human resources, (6) Management of risk, (7) Legal framework, and (8) Environmental policy at the 5% significance level.

This helps to increase capital flow, a rich source of investment capital for many areas of social life. Therefore, green credit is an inevitable direction of the global financial industry in general and the banking industry in Vietnam in particular to implement expanded reproduction, application of advanced technology, and productivity improvement to meet the consumption demand of the domestic market as well as increase the export market share to the world market. In addition, green credit plays a significant role in promoting the process of the social division of labor and economic cooperation in the country and internationally. Green credit policies also contribute to harmonious and balanced development between the economy and the environment, minimizing the negative impacts on production and business activities.

6 Availability of Data and Material

Data can be made available by contacting the corresponding authors.

7 Acknowledgment

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