

**MINISTRY OF EDUCATION
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**LOAN PORTFOLIO MANAGEMENT AT JOINT STOCK
COMMERCIAL BANK FOR INVESTMENT AND
DEVELOPMENT OF VIETNAM**

**Area of Study: Finance – Banking
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**SUMMARY OF DOCTORAL DISSERTATION
IN ECONOMICS**

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Reviewer 3:

*The dissertation will be defended before the Academy-level
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At o'clock on day month year*

PREFACE

1. The urgency of the dissertation topic

Lending is a traditional business activity that generates the main income for commercial banks (CBs). However, lending always carries many risks due to the possibility of customers failing to fulfill their repayment obligations fully or on time. These risks can stem from various causes, including objective factors and force majeure events beyond the control of both the bank and the customer. As large-scale financial intermediaries, CBs are the largest lending intermediaries in each economy, with a diverse portfolio of loans in terms of customer segments and product types. Because of this characteristic, when lending, in addition to managing each individual loan, banks also manage the entire portfolio of loans, aiming to leverage the advantages of a diverse portfolio to maximize income and control risk. An effectively managed loan portfolio helps banks increase income, control risk within defined limits, and thus improve the overall business performance of the bank. With banks expanding their operations and acquiring larger capital, portfolio management becomes even more crucial as banks have the opportunity to effectively leverage their capital advantages to diversify their loan portfolios.

BIDV is one of the earliest and largest banks in Vietnam. Through a comprehensive transformation of its operating model and restructuring over nearly 70 years, BIDV has transformed from a state-owned CB into a joint-stock CB with a controlling stake held by the state, operating in multiple functions and asserting its leading role in the Vietnamese commercial banking system. Regarding lending activities, from a specialized bank in its early days, BIDV has expanded its lending market with a portfolio covering a wide range of sectors, customer segments, and geographical areas. With strong financial capacity, BIDV is also one of the pioneering banks in digital transformation and strengthening its risk management infrastructure. Therefore, its loan portfolio (LP) management is gradually improving, with a low non-performing loan ratio, a diversified LP, and the progressive implementation of modern management tools and techniques. However, in recent years, the domestic and international business environment has been highly volatile due to shocks from the Covid-19 pandemic, the damaging consequences of global climate change, supply chain disruptions, financial market volatility, and inflationary pressures, the position of industries has changed significantly within each country's economy as well as internationally, the trends and borrowing needs of each entity have also changed. Vietnamese CBs, including BIDV, have finalized

Basel II compliance under the Standardized Approach (SA) and are actively transitioning toward the Internal Ratings-Based (IRB) approach, while laying the groundwork for the Basel III framework to enhance overall risk management standards. Currently, BIDV has not established a dedicated, independent LP management department at the system-wide level. BIDV's LP management strategy has not been designed within an independent framework. The planning of LPs is heavily influenced by macroeconomic trends and compliance with State Bank of Vietnam regulations. The bank's LP monitoring still lacks a comprehensive approach from a portfolio perspective. This limits the identification of both concentrated and overall portfolio risks. The bank has not yet utilized modern credit risk management tools, such as debt securitization and credit default swaps. Therefore, studying LP management at BIDV is significant both theoretically and practically. It helps BIDV identify its limitations and develop solutions to improve LP management, thereby contributing to enhanced lending efficiency, increased competitiveness, and stable and sustainable development.

Therefore, the researcher has chosen the topic *"Loan Portfolio Management at the Joint Stock Commercial Bank for Investment and Development of Vietnam"* as the research topic for this dissertation.

2. Overview of research related to the dissertation topic

2.1. Loan portfolio management approach

Stiglitz and Weiss (1981); Zaik et al. (1996); M. G. Crouhy et al. (2000); Goderis et al. (2006); Vosloo and Styger (2009); Joel (2015); Saunders et al. (2018); Bui Dieu Anh (2012); Nguyen Thuy Duong (2012); Phung Thu Ha (2020); Nguyen Bich Ngan (2020)

2.2. Loan portfolio management and organizational model

Jensen and Meckling (1976); Saita (1999); Stein (2002); Berger et al. (2005); Liberti and Mian (2008); Agarwal and Ben-David (2014); Skrastins and Vig (2019); Berg et al. (2020); Nguyen Bich Ngan (2020); Ha Thi Sau (2021)

2.3. Diversification and concentration risk in loan portfolio management

Diamond (1984); Winton (1999); Boot (2000); M. Gordy (2003); Acharya et al. (2006); Tabak et al. (2011); Jahn et al. (2013); Acharya et al. (2017); Koumas et al. (2024); Huynh Japan (2021); Vu Hong Thanh (2020)

2.4. Capital allocation

Zaik et al. (1996); M. Crouhy et al. (2000); Embrechts and McNeil (2000); Artzner et al. (2001); M. B. Gordy (2003); Dermine (2013); Joel (2015)

2.5. Risk-return relationship

Merton (1974); Stiglitz and Weiss (1981); Hellmann et al. (2000); Saunders and Schumacher (2000); Schroeck (2002); Altunbas et al. (2007); Rossi et al. (2009); Martinez-Jaramillo et al. (2014); Joel (2015); Shim (2019); Huynh Japan and Dang Van Dan (2020); Phung Thu Ha (2020); Le Hoai An and Nguyen Thi Ngoc An (2024)

2.6. Tools for monitoring and adjusting loan portfolio

Diamond (1984); Bangia et al. (2002); Sufi (2007); Keys et al. (2010); Dermine (2012); Gande and Saunders (2012); Santos (2012); Moscatelli et al. (2020); Albanese et al. (2023); Orlov et al. (2023); Odunaike et al. (2024); Vu Trung Thanh (2017)

2.7. Influencing factors and new requirements for loan portfolio management

a. Impact of Basel on LP management

M. Gordy (2003); Altman and Sabato (2005); Heid (2007); Repullo and Suárez (2013); King (2013); Khalifeh et al. (2025); Chen (2025); Nguyen Bich Ngan and Nguyen Hien Duc (2024); Nguyen Dieu Huong (2024)

b. Impact of digital transformation on LP management

Berg et al. (2020); Sadhwani et al. (2021); Gambacorta et al. (2023); Moscatelli et al. (2020); Alfonso-Sánchez et al. (2024); Syed et al. (2020); Beck et al. (2022); Danielsson et al. (2022); Phan Thi Hang Nga et al. (2025); Nguyen Thi Thu Trang (2025)

c. Impacts of green credit, ESG integration, and climate risk on LP management

Scholtens (2009); Liu and Feng (2025); Bernstein et al. (2019); Javadi and Masum (2021); Bonacorsi et al. (2024); Houston and Shan (2022); Alogoskoufis et al. (2021); Phetranont and Jaroenjitrkam (2025); Tran Thi Kim Lien (2022)

2.8. Gaps in research

Based on the synthesis and evaluation of research works related to the dissertation topic, the author identifies the gaps in related research, including:

First, no existing study has approached the management of LP in CBs through the lens of modern management theory in a comprehensive and systematic manner—covering from strategic planning and the formulation of LP management policies to organizational structuring and the implementation of these management practices.

Second, no study has examined modern LP management practices at leading global and Vietnamese CBs - such as the Industrial and Commercial Bank of China (ICBC), Standard Chartered Bank (SCB), DBS Bank and Joint

Stock Commercial Bank for Foreign Trade of Vietnam (Vietcombank) - with data updated through 2025, in order to derive lessons for other CBs.

Third, there has been no research on LP management at Vietnamese CBs during the period in which they have formally implemented LP management in accordance with Basel II; consequently, there is a lack of comprehensive analysis and assessment regarding this practice within these institutions.

Fourth, there has been no doctoral dissertation focusing on LP management at BIDV.

3. Research questions

- What fundamental theories best explain the mechanism of LP management in CBs according to international practices?
- How is LP management implemented at BIDV during the period 2019-2025?
- What factors affect the risk of the LP at BIDV? What is the extent and direction of their impact?
- What are the achievements, limitations, and causes of these limitations in LP management at BIDV during the official implementation of Basel II banking management (2019-2025)?
- What opportunities and challenges does the economic development trend and strategic orientation of the Vietnamese banking industry present for BIDV's LP management in the period up to 2030?
- What solutions should be applied to BIDV to improve its LP management, ensuring credit growth goes hand in hand with achieving profit targets and effectively controlling risks?

4. Research Objectives and Tasks

4.1 Research Objectives

- General objective: To examine the theoretical and practical foundations of LP management at BIDV, and subsequently propose solutions to enhance this management, thereby contributing to risk control and improved business performance for the bank.

- Specific objectives:

First, comprehensively and systematically synthesize the theoretical framework for LP management in CBs, based on modern management theories. This includes analyzing the practices of leading international and domestic CBs - particularly as they move toward adopting Basel III standards—while accounting for the significant impacts of digital transformation, the green transition, the integration of ESG criteria, and climate-related risks.

Second, examine the current state of LP management at BIDV, and subsequently provide an assessment of the results achieved as well as the limitations in this area.

Third, propose sets of solutions and recommendations for enhancing the LP management at BIDV by 2030.

4.2. Research Tasks

Review domestic and international research works related to LP management to build a theoretical framework for LP management.

Systematize and clarify the theoretical basis of LPs and LP management of commercial banks.

Collect, process, and analyze data on LPs and LP management of BIDV during the research period, applying the ARDL model to evaluate factors affecting the effectiveness of LP management.

Analyze the current state of LP management at BIDV during the period 2019-2025 according to the defined contents and criteria, thereby evaluating the achievements, limitations, and causes of limitations in LP management at BIDV.

Propose solutions and recommendations to improve LP management activities at BIDV by 2030.

5. Research subject and scope

Research subject: Management of the loan portfolio at CBs.

Research scope:

Geographical/Organizational scope: The dissertation focuses on loan portfolio management activities at BIDV (excluding lending activities at BIDV's subsidiaries and associates).

Regarding the timeframe: The dissertation examines the current state of LP management at BIDV during the 2019–2025 period and proposes solutions and recommendations to enhance this management through 2030.

6. Research methodology

Based on the dialectical materialism and historical materialism methodology of Marxism-Leninism, to achieve the research objectives, the dissertation uses a combination of qualitative and quantitative research methods.

Qualitative research methods: Based on the collected, processed, and analyzed data, the dissertation uses a combination of qualitative research methods such as: statistical methods; comparative, analytical, and synthetic methods; logical reasoning methods... to systematize the theoretical basis,

analyze the current situation, and propose solutions and recommendations to improve LP management at BIDV by 2030.

Quantitative Research Methodology: To further clarify the impact of LP management on non-performing loans at BIDV, this dissertation uses quantitative research methodology, specifically as follows:

+ **Research Model:** The dissertation uses the Autoregressive Distributed Lag Model (ARDL) developed by Pesaran et al. (2001). In this dissertation, with the goal of assessing the impact of loan portfolio management on the risk of the loan portfolio at BIDV, the author chose the ARDL model because it allows for: absolute flexibility in the integration level of the data series; efficient processing with a small sample of observations; allows identification of immediate short-term impacts, the speed of adjustment to equilibrium, and sustainable long-term relationships; and can automatically control the autocorrelation phenomenon of residuals and significantly minimize deviations caused by endogenous variables.

Table 1. Definition of variables in the NPL estimation model

Variable	Definition of Variable	Expected Direction
Dependent variable		
NPL	The ratio of non-performing loans to total outstanding loans at BIDV	
Independent variable		
GDP	GDP growth rate over the periods	-
LAMPHAT	Consumer Price Index	+
TL_THATNGHIEP	Unemployment rate	+
TT_DUNO_QT	Previous period's loan growth rate	+
CV_NGANHAN	Short-term loan proportion	+
CV_XAYDUNG	Proportion of outstanding loans in the construction sector	+
KN_BUDAPRR	Credit risk compensation capability	-
ROA	Return on total assets	-
TL_DUNOCVTIENGUI	The ratio of outstanding loans to customer deposits.	+
DVAMC	Dummy variable for the VAMC establishment event	-

Source: Research by PhD candidate

Based on the original model, the dissertation proposes the following research model:

$$\begin{aligned}
NPL_t = & \alpha_0 + \sum_{i=1}^p \alpha_i NPL_{t-i} + \sum_{m=0}^{q_1} \beta_{1,m} GDP_{t-m} + \sum_{m=0}^{q_2} \beta_{2,m} LAMPHAT_{t-m} \\
& + \sum_{m=0}^{q_3} \beta_{3,m} TL_THATNGHIEP_{t-m} + \sum_{m=0}^{q_4} \beta_{4,m} TT_DUNO_QT_{t-m} \\
& + \sum_{m=0}^{q_5} \beta_{5,m} CV_NGANHAN_{t-m} + \sum_{m=0}^{q_6} \beta_{6,m} CV_XAYDUNG_{t-m} \\
& + \sum_{m=0}^{q_7} \beta_{7,m} TL_DUNOCVTIENGUI_{t-m} + \sum_{m=0}^{q_8} \beta_{8,m} KN_BUDAPRR_{t-m} \\
& + \sum_{m=0}^{q_9} \beta_{9,m} ROA_{t-m} + \gamma DVAMC_t + \varepsilon_t
\end{aligned}$$

+ Research Data: With the chosen research model, the dissertation uses 80 observations collected from BIDV's financial reports for the period 2006-2025 and some macroeconomic data from publication of the Vietnam General Statistics Office during the same period.

+ Data Processing: With the collected and cleaned observation samples, the dissertation uses STATA software with the processing steps:

Step 1: Declare time series for the model data

Step 2: Test for stationarity of the data series

Step 3: Determine the optimal lag structure and estimate the Error Correction Model (ECM)

Step 4: Test for defect diagnosis and coefficient stability of the model

Step 5: Analyze the ARDL regression model.

7. Scientific and practical significance of the Dissertation

7.1. Scientific significance

- The dissertation clarifies the theoretical basis of lending activities, LPs, and LP management of CBs set against the backdrop of CBs moving towards Basel III compliance, amidst the impacts of digital transformation, green credit, ESG integration, and climate risks.

- The dissertation contributes to supplementing and perfecting the theory of LP management from strategic planning and policy development to the implementation of LP management.

7.2. Practical significance

- For BIDV: The research results of the dissertation are a useful reference for BIDV in the process of improving its LP management set against the backdrop of CBs moving towards Basel III compliance, amidst the impacts of digital transformation, green credit, ESG integration, and climate risks.

- For the Vietnamese commercial banking system in general: The successful solutions at BIDV will be a useful reference for other CBs.

- For State management agencies: The policy recommendations of this dissertation can help state management agencies consider and apply them in the process of formulating policies and implementing state management of lending activities and LP management of CBs.

8. New contributions of the Dissertation

Based on the selective inheritance of relevant studies, the research results of this dissertation make new contributions in both theory and practice as follows:

First, the dissertation systematizes and clarifies fundamental theoretical issues regarding LP management in CBs, set against the backdrop of the transition toward Basel III standards and the impacts of digital transformation, green credit, ESG integration, and climate-related risks on bank LP management.

Second, the dissertation examines loan portfolio management practices at selected domestic and foreign CBs, identifies valuable lessons applicable to BIDV's loan portfolio management, and uses these as a basis to propose solutions for enhancing the bank's loan portfolio management.

Third, utilizing comprehensive and clearly sourced secondary data, the dissertation systematically evaluates the state of LP management at BIDV during the 2019–2025 period across four dimensions: strategic planning, policy formulation, organizational structure, and implementation. A novel aspect of the dissertation is its integration of management practice assessment with a quantitative model based on 80 secondary data observations—sourced from the financial reports of BIDV and the Statistics Office of Vietnam—thereby providing empirical evidence regarding factors associated with LP risk at BIDV. The model results indicate a statistically significant relationship between portfolio composition by sector, credit growth, and the level of non-performing loans within the portfolio. By cross-referencing quantitative findings with actual management practices, the dissertation more clearly identifies the achievements, limitations, and underlying causes of those limitations regarding loan portfolio management at BIDV.

Fourth, the dissertation proposes a system of solutions to enhance loan portfolio management at BIDV for the 2026–2030 period. These solutions are formulated based on identified limitations and their underlying causes, as well as the bank's specific implementation conditions, while aiming to adopt international best practices in alignment with Vietnamese legal regulations. Additionally, the dissertation offers recommendations to the Government and the State Bank of Vietnam—within their respective jurisdictions—to facilitate the implementation of these solutions.

9. Structure of the Dissertation

Besides the introduction, conclusion, and bibliography, the dissertation includes 3 chapters:

Chapter 1: Theoretical basis of loan portfolio management of commercial banks.

Chapter 2: Current situation of loan portfolio management at BIDV

Chapter 3: Solutions to improve loan portfolio management at BIDV.

CHAPTER 1

THEORETICAL FOUNDATIONS OF LOAN PORTFOLIO MANAGEMENT OF COMMERCIAL BANKS

1.1. OVERVIEW OF LENDING ACTIVITIES AND LOAN PORTFOLIO OF COMMERCIAL BANKS

1.1.1. Lending activities of commercial banks

Lending is a form of credit granting through which the lender provides or commits to providing a sum of money to the customer for a specified purpose, within a certain period, on the principle of full repayment of principal and interest as agreed to the lender.

1.1.2. Loan portfolio of commercial banks

A loan portfolio is a collection of loans of a bank selected by the bank according to certain criteria to achieve the credit business objectives defined in each specific period.

1.2. LOAN PORTFOLIO MANAGEMENT OF COMMERCIAL BANKS

1.2.1. The concept of loan portfolio management in commercial banks

Loan portfolio management is the process by which bank managers build, allocate, monitor, and adjust the value structure of the bank's loans to achieve operational objectives in accordance with the bank's risk appetite.

1.2.2. The role of loan portfolio management activities in commercial banks

(i) Optimizing bank profits by maintaining an optimal and rational loan structure; (ii) Controlling risks and improving the bank's credit quality; (iii) Contributing to the bank's business orientation and strategy; (iv) Contributing to ensuring the bank's operational safety as well as national financial security.

1.2.3. Loan portfolio management methods

Based on the level of intervention and adjustment by the bank to the LP structure, LP management methods are divided into passive and active methods. Based on the basis for making portfolio management decisions, LP management methods are divided into compliance management and risk-based management methods.

1.2.4. Content of commercial bank's loan portfolio management

Commercial bank LP management comprises four main components: (1) Planning the LP management strategy; (2) Developing the LP management policy; (3) Organizing the LP management system; (4) Organizing the implementation of LP management (including: Developing and implementing the LP; Monitoring the LP; Adjusting the LP).

1.2.5. Assessing the impact of loan portfolio management on loan portfolio risk using an ARDL model

1.2.6. Factors affecting the loan portfolio management of commercial banks

External factors: (i) Legal environment; (ii) Economic environment; (iii) Development of the financial market; (iv) Development of science and technology; (v) Level of international economic integration of the country in the financial and banking sector; (vi) Transparency of customer finances.

Internal factors: (i) Scale and risk management capacity of CB; (ii) Business strategy and risk appetite of CBs; (iii) Financial capacity of CB; (iv) Credit risk management policy of CB; (v) Level of application of information technology in CB; (vi) Quality of human resources of CB.

1.3. EXPERIENCES IN MANAGING LOAN PORTFOLIO FROM SEVERAL COMMERCIAL BANKS AND LESSONS FOR BIDV

Experiences from: Industrial and Commercial Bank of China (ICBC); Standard Chartered Bank (SCB); DBS Bank; Vietnam Foreign Trade Commercial Bank (Vietcombank).

CHAPTER 2

CURRENT SITUATION OF LOAN PORTFOLIO MANAGEMENT AT BIDV

2.1. OVERVIEW OF BIDV

This section provides an overview of BIDV: its history of formation and development; its organizational model and management structure; and its business performance during the period 2019 – 2025.

Unit: Billion VND, %

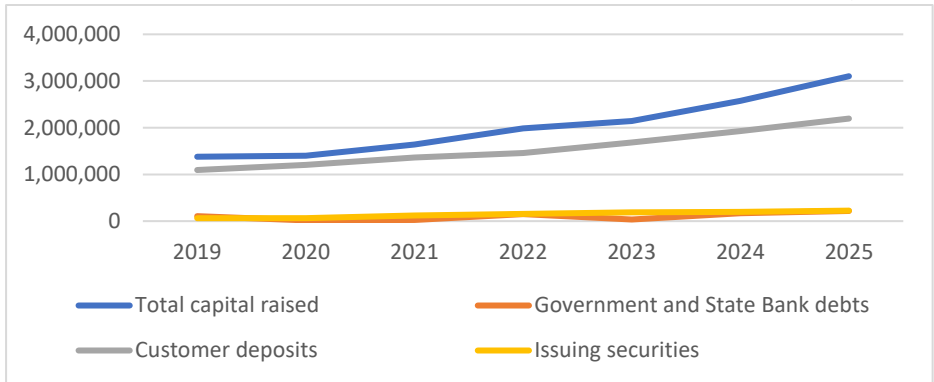


Diagram 2.4. BIDV's capital mobilization activities

Source: Audited separate financial statements of BIDV

Table 2.1. BIDV's credit granting situation

Unit: Billion VND, %

Indicator	2019	2020	2021	2022	2023	2024	2025
Outstanding loan balance	1,081,556	1,178,683	1,319,980	1,488,151	1,740,391	2,013,808	2,321,469
NPL ratio (%)	1.66	1.66	0.93	1.15	1.21	1.37	1.44

Source: Audited separate financial statements of BIDV

Table 2.2. BIDV's business performance results

Unit: billion VND, %

Indicator	2019	2020	2021	2022	2023	2024	2025
ROE	11.41	9.01	12.43	20.32	20.18	19.48	17.44
ROA	0.57	0.45	0.59	0.95	0.99	1.00	0.87

Source: Audited separate financial statements of BIDV

2.2. CURRENT STATUS OF THE LOAN PORTFOLIO AT BIDV

Unit: billion VND, %

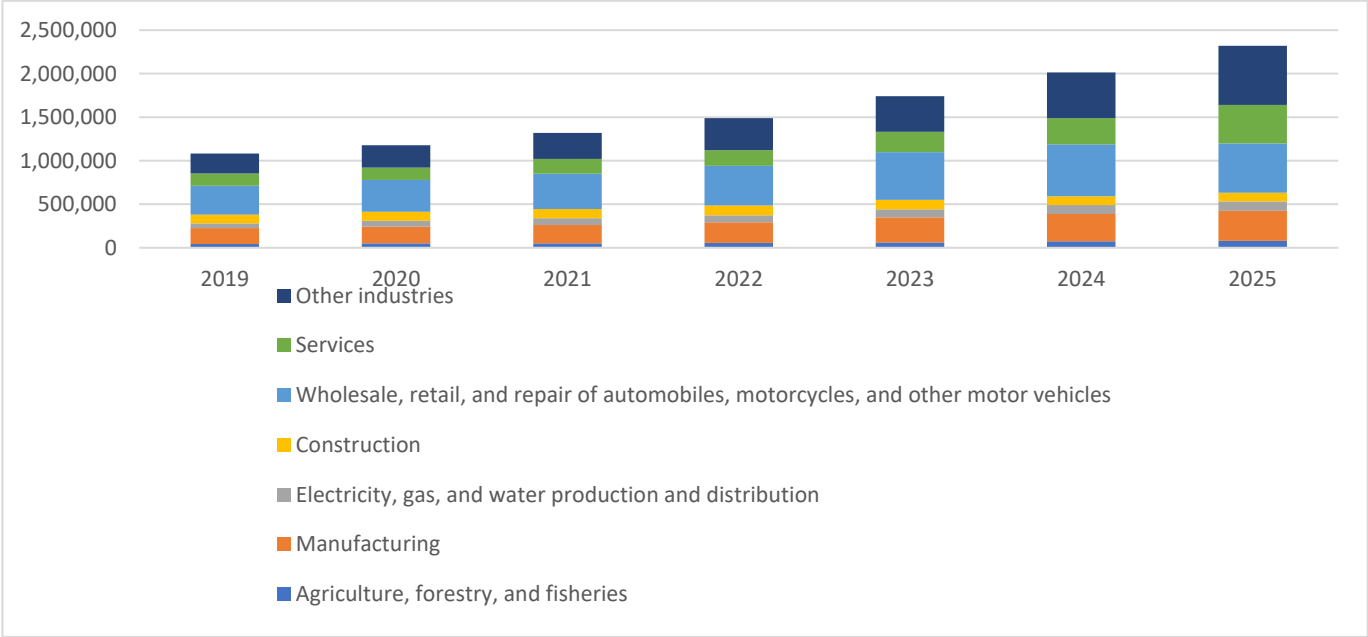


Diagram 2.5. Loan portfolio by economic sector of BIDV

Source: Audited separate financial statements of BIDV

Unit: Billion VND, %

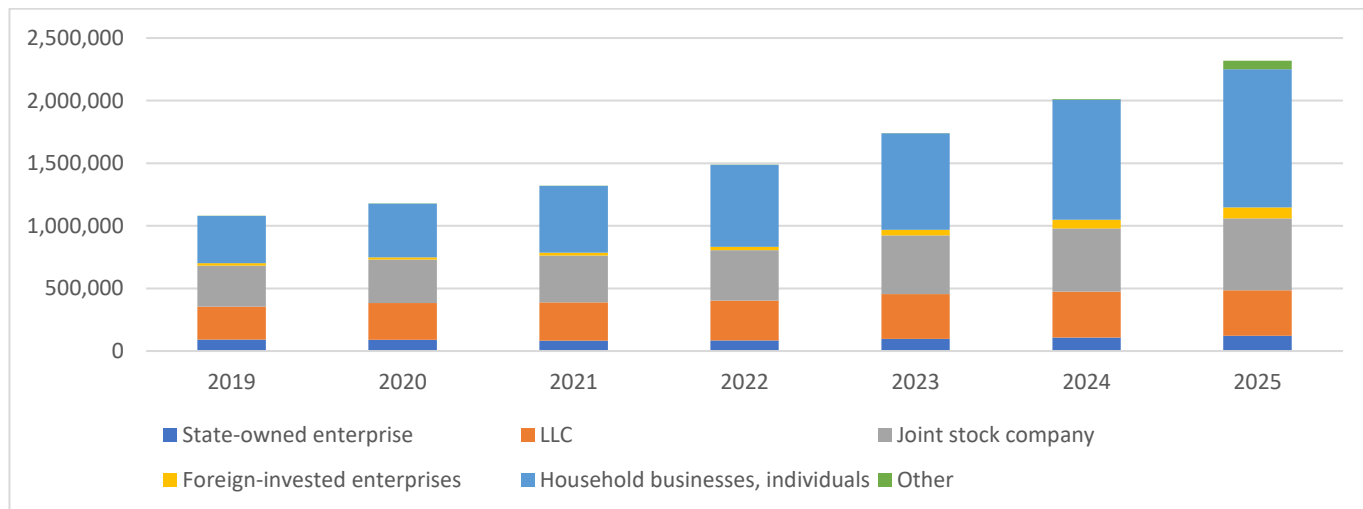


Diagram 2.7. Loan portfolio by customer type of BIDV

Source: Audited separate financial statements of BIDV

Unit: billion VND, %

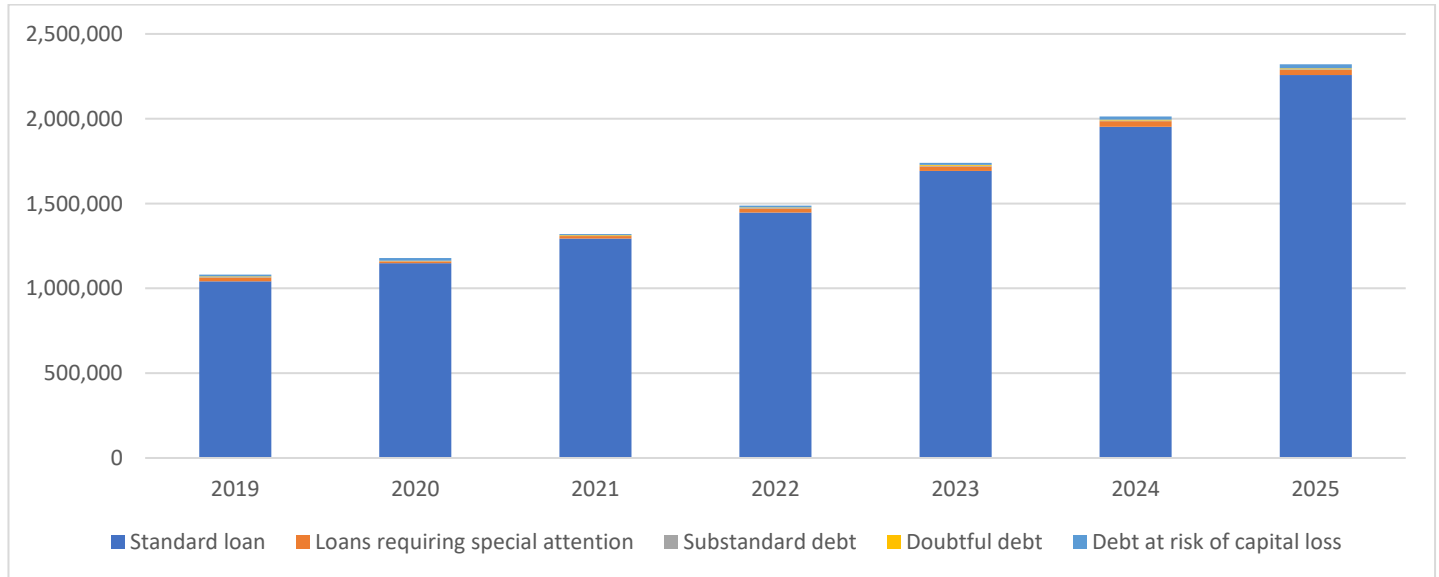


Diagram 2.8. Loan portfolio by debt classification group

Source: Audited separate financial statements of BIDV

2.3. CURRENT STATUS OF LP MANAGEMENT AT BIDV

2.3.1. Strategic planning for loan portfolio management

Table 2.4. Strategic planning indicators for credit risk management of the entire portfolio

No	Indicator	2021	2022	2023	2024	2025
I	Indicators of scale and structure	<i>Unit: billion VND, %</i>				
1	Credit growth at an average rate of 8.5%-12.5% per year	1,333,232	1,446,000-1,509,000	1,569,000-1,698,000	1,703,000-1,910,000	1,847,000-2,149,000
II	Quality indicators	<i>Unit: billion VND, %</i>				
1	Non-performing loan ratio/ Total outstanding loan	0.9%	≤1.5%	≤1.4%	≤1.3%	≤1.2%
2	Ratio of Group 2 loan/ Total outstanding loan	1.47%	≤3.0%	≤3.0%	≤3.0%	≤3.0%

Source: Component Strategy “Improving credit quality and recovering non-performing loans and off-balance debts in the period 2021-2025”

BIDV does not yet have a separate LP management strategy, but many aspects of the strategy, such as restructuring LPs, centralized risk control, improving credit quality, and handling non-performing loans, have significantly contributed to BIDV's loan portfolio management.

2.3.2. Developing loan portfolio management policies

BIDV issued a fairly comprehensive and complete system of policies and regularly adjusted and updated policies annually or according to specific operational periods to meet the requirements of the bank's LP management activities. BIDV developed two main groups of LP management policies: a group of policies on credit granting and a group of policies on BIDV's risk management.

2.3.3. Organizing the loan portfolio management structure

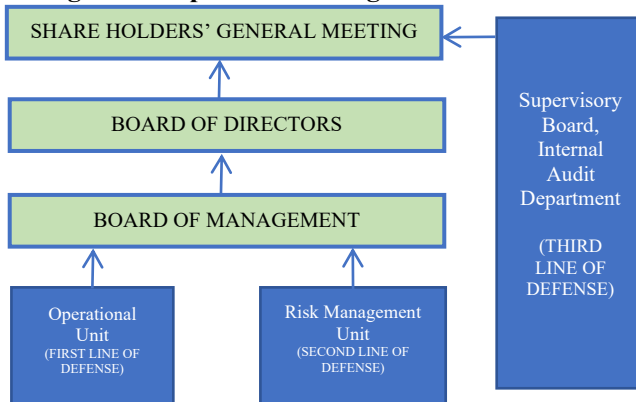


Diagram 2.10. Loan portfolio management model at BIDV

Source: BIDV Annual Report 2019-2025

BIDV's organizational structure for implementing loan portfolio is built on a vertical model through the regulation of management levels. At each management level, the principle of independence between operational activities, risk management, and internal control must be ensured.

2.3.4. Organization of loan portfolio management implementation

2.3.4.1. Loan portfolio development and implementation

BIDV's current LP plan mainly focuses on determining the year-end loan balance of the entire system and each branch; the growth rate of the LP; the quality of the LP (expressed through the non-performing loan ratio); and the profitability of the LP (expressed through the profit indicator).

2.3.4.2. Loan portfolio monitoring

a. Content of LP monitoring at BIDV: (1) Monitoring compliance with credit regulations and implementation of assigned plan targets for branches; (2) Monitoring early warning of risks; (3) Monitoring credit risk of the LP; (4) Monitoring the profitability of the LP.

Table 2.10. Non-performing loan ratio at BIDV

Unit: %

Indicator	2019	2020	2021	2022	2023	2024	2025
Planned NPL ratio	< 2%	< 1.6%	< 1.6%	< 1.6%	≤1.4%	≤1.4%	< 1.6%
The ratio of NPL implemented	1.66	1.66	0.93	1.15	1.21	1.37	1.44

Source: Audited separate financial statements of BIDV

**Table 2.14. Measuring BIDV's loan portfolio risk
by economic sector**

Year	2019	2020	2021	2022	2023	2024	2025
HHI	0.19657	0.19814	0.19952	0.20494	0.20750	0.20886	0.20878
Gini	0.17041	0.17169	0.17457	0.18233	0.18617	0.18651	0.18863

Source: Research by PhD candidate

b. Tools supporting the monitoring of the LP at BIDV: (1) Internal credit rating system; (2) Centralized credit management and loan approval model for large, high-risk loans; (3) Stress testing of the LP in credit risk management at BIDV; (4) Monitoring reporting system.

2.3.4.3. Adjusting the loan portfolio

BIDV uses internal adjustment methods for the LP to reduce concentration risk in the portfolio. BIDV deploys various internal adjustment measures, including debt recovery, reducing credit exposure to sectors with high concentration risk, expanding credit to sectors with strong growth potential, and conducting debt trading.

2.3.5. Assessing the impact of LP management on the risk of the LP

Table 2.20. Estimation results of the autoregressive lagged distribution model

ARDL(4,1,4,4,0,4,3,0,4,0) regression							
Sample: 2007q1 thru 2025q4				Number of obs = 76			
				R-squared = 0.8987			
				Adj R-squared = 0.8148			
Log likelihood = 408.85026				Root MSE = 0.0015			
	D.NPL	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
ADJ	NPL	-.3998949	.0508847	-7.86	0.000	-.5026586	-.2971313
LR	GDP	-.0000724	.000006	-1.21	0.234	-.0001937	.0000488
	LAMPHAT	.0024743	.0009427	2.62	0.012	.0005705	.0043781
	TL_THATNGHIEP	-.0112747	.0025259	-4.46	0.000	-.0163759	-.0061735
	TT_DUNO_QT	.0400464	.0323285	1.24	0.222	-.0252424	.1053352
	CV_NGANHAN	.1478431	.0430183	3.44	0.001	.0609658	.2347293
	CV_XAYDUNG	.1998144	.0476643	4.19	0.000	.1035544	.2960743
	TL_DUNOCVTIENGUI	.0000998	.0002009	0.50	0.622	-.000306	.0005057
	KN_BUDAPRR	-.1932593	.1114702	-1.73	0.090	-.4183779	.0318593
	ROA	-.0184627	.0045392	-4.07	0.000	-.0276297	-.0092956
SR	NPL	-.0386145	.0097371	-0.39	0.701	-.2400376	.1628086
	LD.	-.2600986	.1009869	-2.58	0.014	-.4640457	-.0561515
	L3D.	-.3329248	.0895609	-3.72	0.001	-.5137968	-.1529528
	GDP	.0000134	.0000126	1.06	0.294	-.0000121	.0000389
	D1.	.0000134	.0000126	1.06	0.294	-.0000121	.0000389
	LAMPHAT	.0000134	.0000126	1.06	0.294	-.0000121	.0000389
	D1.	-.0008423	.0003018	-2.79	0.008	-.0014517	-.0002329
	LD.	-.0009111	.0002657	-3.43	0.001	-.0014476	-.0003745
	L2D.	-.0005363	.0002239	-2.39	0.021	-.0009885	-.000084
	L3D.	-.0003946	.0001843	-2.14	0.038	-.0007668	-.0000224
	TL_THATNGHIEP	.0034032	.0008982	3.79	0.000	.0015893	.0052171
	D1.	.0026824	.0007582	3.54	0.001	.0011512	.0042137
	LD.	.001623	.0006217	2.61	0.013	.0003673	.0028766
	L3D.	.0008269	.000562	1.47	0.149	-.0003081	.0019619
	CV_NGANHAN	-.0565035	.0333643	-1.69	0.098	-.1238841	.0108771
	LD.	-.0682273	.0336118	-2.03	0.049	-.1361078	-.0003469
	L2D.	-.0486571	.0363733	-1.34	0.188	-.1221144	.0248093
	L3D.	-.1621389	.0347907	-4.66	0.000	-.2324001	-.0918778
	CV_XAYDUNG	-.0894282	.0390115	-2.29	0.027	-.1682135	-.0106428
	D1.	-.0341273	.0450255	-0.76	0.453	-.1250582	.0568036
	L2D.	-.052265	.0429416	-1.22	0.231	-.1389872	.0344573
	KN_BUDAPRR	.0624299	.0498437	1.25	0.217	-.0382314	.1630912
	LD.	.0022051	.0473591	0.05	0.963	-.0934386	.0978489
	L2D.	-.032816	.0437032	-0.75	0.457	-.1210763	.0554444
	L3D.	-.0959183	.0408686	-2.35	0.024	-.1784541	-.0133824
	DVAMC	-.0040989	.0011271	-3.64	0.001	-.0063751	-.0018227
	_cons	-.0200137	.0134495	-1.49	0.144	-.0471756	.0071481

Source: Researcher's study

Regression model results: Based on the output from STATA using the ec option, the optimal model for the dataset is the ARDL(4,1,4,4,0,4,3,0,4,0) structure.

The results consist of two main parts: the long-run equation and the short-run equation. The detailed formula of the model rewritten from the above results is as follows:

- Long-Run Equation

The LR part in the results table shows the long-term relationship between NPL and the independent variables:

$$\begin{aligned} \text{NPL}_t = & -0.0000724 \text{ GDP}_t + 0.0024743 \text{ LAMPHAT}_t \\ & - 0.0112747 \text{ TL_THATNGHIEP}_t + 0.0400464 \text{ TT_DUNO_QT}_t \\ & + 0.1478431 \text{ CV_NGANHAN}_t + 0.1998144 \text{ CV_XAYDUNG}_t \\ & + 0.0000998 \text{ TL_DUNOCVTIENGUI}_t \\ & - 0.1932593 \text{ KN_BUDAPRR}_t - 0.0184627 \text{ ROA}_t \end{aligned}$$

From this equation, we can derive the Error Correction Term (ECT), which represents the degree of deviation from long-run equilibrium. In the previous period (t-1):

$$\begin{aligned} \text{ECT}_{(t-1)} = & \text{NPL}_{(t-1)} - (-0.0000724 \text{ GDP}_{(t-1)} \\ & + 0.0024743 \text{ LAMPHAT}_{(t-1)} - 0.0112747 \text{ TL_THATNGHIEP}_{(t-1)} \\ & + 0.0400464 \text{ TT_DUNO_QT}_{(t-1)} + 0.1478431 \text{ CV_NGANHAN}_{(t-1)} \\ & + 0.1998144 \text{ CV_XAYDUNG}_{(t-1)} \\ & + 0.0000998 \text{ TL_DUNOCVTIENGUI}_{(t-1)} \\ & - 0.1932593 \text{ KN_BUDAPRR}_{(t-1)} - 0.0184627 \text{ ROA}_{(t-1)}) \end{aligned}$$

- Short-Run Error Correction Equation (Short-Run ECM)

$$\begin{aligned} \Delta \text{NPL}_t = & -0.0200137 - 0.3998949 \text{ ECT}_{(t-1)} - 0.0386145 \Delta \text{NPL}_{(t-1)} \\ & - 0.2600986 \Delta \text{NPL}_{(t-2)} - 0.3329248 \Delta \text{NPL}_{(t-3)} + 0.0000134 \Delta \text{GDP}_t \\ & - 0.0008423 \Delta \text{LAMPHAT}_t - 0.0009111 \Delta \text{LAMPHAT}_{(t-1)} \\ & - 0.0005363 \Delta \text{LAMPHAT}_{(t-2)} - 0.0003946 \Delta \text{LAMPHAT}_{(t-3)} \\ & + 0.0034032 \Delta \text{TL_THATNGHIEP}_t + 0.0026824 \Delta \text{TL_THATNGHIEP}_{(t-1)} \\ & + 0.0016230 \Delta \text{TL_THATNGHIEP}_{(t-2)} + 0.0008269 \Delta \text{TL_THATNGHIEP}_{(t-3)} \\ & - 0.0565035 \Delta \text{CV_NGANHAN}_t - 0.0682273 \Delta \text{CV_NGANHAN}_{(t-1)} \\ & - 0.0486571 \Delta \text{CV_NGANHAN}_{(t-2)} - 0.1621389 \Delta \text{CV_NGANHAN}_{(t-3)} \\ & - 0.0894282 \Delta \text{CV_XAYDUNG}_t - 0.0341273 \Delta \text{CV_XAYDUNG}_{(t-1)} \\ & - 0.0522650 \Delta \text{CV_XAYDUNG}_{(t-2)} + 0.0624299 \Delta \text{KN_BUDAPRR}_t \\ & + 0.0022051 \Delta \text{KN_BUDAPRR}_{(t-1)} - 0.0328160 \Delta \text{KN_BUDAPRR}_{(t-2)} \\ & - 0.0959183 \Delta \text{KN_BUDAPRR}_{(t-3)} - 0.0040989 \text{ DVAMC}_t \end{aligned}$$

Post-model defect tests all show that the model meets the following criteria:

(i) Confirms the existence of a long-term (cointegration) relationship between NPL and the model contains 9 independent variables.

(ii) There is no autocorrelation of residuals;

(iii) There is no heteroskedasticity;

(iv) The residuals of the model have a normal distribution;

(v) The model is completely stable and structurally sound; the relationship between macroeconomic/financial variables and NPL in the model is very good;

(vi) The model is correctly established and there is no statistical evidence (at the 5% level) showing that any important variables are missing;

(vii) The average Variance Inflation Factor (VIF) of 7.59 indicates that the model does not suffer from severe multicollinearity.

2.4. ASSESSMENT OF THE CURRENT STATE OF LOAN PORTFOLIO MANAGEMENT AT BIDV DURING THE PERIOD 2019 - 2025

2.4.1. Achieved Results:

(i) Strategic objectives for LP governance have been established, and the bank has implemented the setting of basic indicators for LP in the annual plan; (ii) Credit and risk management policies have been issued to provide a basis for LP governance, and these policies are regularly updated and improved; (iii) The components of the organizational structure for LP management have been gradually built; (iv) Adherence to the principle of diversifying LPs; (v) Emphasis on monitoring the implementation of LPs, establishing and continuously improving portfolio monitoring tools; (vi) Utilization of internal balance sheet adjustments, handling and recovery of bad debts; (vii) Relatively effective LP management.

2.4.2. Limitations:

(i) The LP management strategy has not been designed within an independent framework, and the level of integration with actual operations is not truly close and synchronized; (ii) The organizational design and operational efficiency of the LP management system are still inadequate; (iii) The development and implementation of LPs are limited in terms of proactiveness and portfolio structure orientation; (iv) Monitoring of LP implementation does not fully meet the requirements of modern LP management; (v) The LP risk measurement tools do not meet the requirements of modern portfolio

management and governance in accordance with international practices; (vi) LP adjustments are not truly proactive and lack modern market-based tools; (vii) The balance between credit growth targets, profitability, and risk control in LP management is not truly sustainable and optimized.

2.4.3. Causes of limitations

Subjective causes: (i) The awareness and orientation of LP management by modern management levels are inadequate; (ii) The organizational model based on administrative networks, leaning towards traditional management and applying cost optimization, dominates the development of a specialized department for LP management; (iii) The data management system and information infrastructure serving LP management do not fully support strategy development or the level of strategic alignment with actual operations; (iv) The ownership model and capital size of the bank affect the efficiency of LP management and optimization; (v) The professional capacity and experience of personnel in LP management have not kept pace with the requirements of modern management.

Objective causes: (i) Unpredictable fluctuations in the macroeconomic environment; (ii) The legal framework regulating banking activities is unstable and incomplete, hindering the implementation of modern LP management tools; (iii) The Vietnamese financial market is not yet fully developed, limiting the ability to diversify and transfer risks for BIDV; (iv) The level of digital transformation of the economy and national data infrastructure is still inconsistent; (v) The level of transparency of customers' financial information is still limited.

CHAPTER 3

SOLUTIONS FOR IMPROVING LOAN PORTFOLIO MANAGEMENT AT BIDV

3.1. ORIENTATION FOR DEVELOPMENT AND IMPROVEMENT OF LOAN PORTFOLIO MANAGEMENT OF BIDV UP TO 2030

3.1.1. Development orientation of BIDV until 2030

BIDV positions itself with the vision of becoming a leading, LARGE, STRONG, and GREEN Financial and Banking Group in Southeast Asia, striving to be among the top 100 strongest banks in Asia by 2030.

LARGE: BIDV aims for a comprehensive transformation of its retail and wholesale banking operations to maintain its leading position in the retail and

SME customer segments and strive to be the leader in the FDI customer segment in Vietnam.

STRONG: BIDV aims to be a leader in innovation, technology, and digital transformation in Vietnam, enhancing risk control capabilities, being prepared to respond to and increasing adaptability to changes in the business environment, and building a high-quality workforce.

GREEN: BIDV aims to become the leading bank in the Vietnamese market in green and sustainable development and ESG practices, and to be the leader in green credit balance.

3.1.2. Orientations for improving loan portfolio management at BIDV by 2030

(i) Orientation for LP management based on the principles of safety, efficiency, and sustainability; (ii) Orientation for diversifying the LP and minimizing concentration risk; (iii) Orientation for improving credit quality associated with controlling bad debts; (iv) Orientation for managing LPs according to Basel II and Basel III standards; (v) Orientation for promoting digital transformation in LP management.

3.1.3. Opportunities and challenges in improving loan portfolio management at BIDV in the coming time

Opportunities: The banking legal and institutional system is increasingly being perfected; Proactive and effective direction and management of credit activities by the State Bank of Vietnam; The recovery and growth of the Vietnamese economy; Strong digital transformation.

Challenges: The macroeconomic context remains challenging, and extreme climate change is occurring; some legal regulations and policy mechanisms to control safety and promote digital transformation and green transformation for the credit institution system are slow to be issued; the demand for risk management is increasingly high according to international standards; investment in management infrastructure and strengthening the capacity of professional staff are required.

3.2. SOLUTIONS FOR IMPROVING LOAN PORTFOLIO MANAGEMENT AT BIDV BY 2030

3.2.1. Improving the strategic framework for LP management and strengthening the connection between strategy and LP execution at BIDV

BIDV needs a clear strategic framework for LP management that can guide portfolio structure and control risk across the entire system; ensuring that the strategy is implemented consistently from the Head Office to business units.

3.2.2. Improving the loan portfolio management policy system

Banks need to continuously improve their LP management policy system, from credit granting policies, credit limit policies, risk classification and provisioning policies, risk control culture, etc.

3.2.3. Improving and enhancing the effectiveness of the loan portfolio management organizational structure

a. Improving the dedicated LP management structure: Banks need to establish a dedicated unit within the Risk Management Department to manage LPs, thereby enhancing specialization and overcoming the current fragmented functional structure.

b. Enhancing the operational efficiency of the LP management system: BIDV needs to strengthen the coordination and information sharing mechanisms between business units, risk management units, and the LP management department.

3.2.4. Improving the loan portfolio development and implementation

BIDV needs to improve the development and implementation of its LP in accordance with the bank's strategic direction and risk appetite. The planned LP should be developed based on a combination of business growth targets, capital utilization capacity, risk tolerance levels, and the development prospects of various economic sectors.

3.2.5. Enhancing the effectiveness of loan portfolio implementation monitoring

BIDV needs to strengthen its monitoring of portfolio implementation by adopting a risk management approach at the portfolio level, rather than focusing solely on individual loans. In addition to monitoring the quality of each loan, the bank should regularly monitor the concentration of loans by industry, geographical area, customer group, and market segment to promptly identify risks that may affect the entire LP.

BIDV needs to continue improving its portfolio risk measurement system by adopting international standards and modern governance practices. The focus should be on shifting from primarily assessing risk at the individual loan level to measuring risk across the entire portfolio, ensuring it fully reflects the level of credit concentration, risk correlations among customers, industries, geographical regions, and macroeconomic factors.

3.2.6. Improving the method and tools for proactively adjusting the loan portfolio and optimizing profit-risk ratio

Improving the method of proactively adjusting the LP and optimizing profit-risk ratio will help BIDV improve capital allocation efficiency, enhance credit quality, increase profitability, and ensure the safe and sustainable development of its lending activities in the long term.

3.2.7. Strengthening financial capacity and capital allocation efficiency in loan portfolio management

BIDV needs to simultaneously strengthen its financial capacity and improve its risk-based capital allocation mechanism to enhance the efficiency of LP management.

3.2.8. Developing human resources to meet the requirements of modern and internationally integrated loan portfolio management

BIDV needs to develop a human resource development strategy that is professional, modern, and meets the requirements of LP management in the new context. Through recruitment and retraining, the bank needs to gradually build a team of experts specializing in LP management, credit risk management, and quantitative analysis, capable of researching, developing, and operating models for measuring, forecasting, and adjusting portfolios according to modern management standards.

3.2.9. Promoting the application of digital technology and data in loan portfolio management

BIDV needs to continue improving its centralized data system serving LP management. BIDV needs to upgrade its Management Information System (MIS) towards automating the collection, aggregation, and processing of data from units throughout the system. The bank also needs to strengthen the application of Big Data analytics, artificial intelligence (AI), and machine learning technologies in LP management.

3.3. SOME RECOMMENDATIONS TO THE GOVERNMENT AND THE STATE BANK OF VIETNAM

In this context, the researcher puts forward four recommendations to the Government and the State Bank of Vietnam, serving as prerequisites for BIDV to implement the proposed solutions, including:

3.3.1. Enhancing macroeconomic management and forecasting capacity

3.3.2. Developing a market-based debt trading market

3.3.3. Completing the legal framework supporting loan portfolio management in accordance with international practices

3.3.4. Improving infrastructure and promoting data sharing for banking risk management

CONCLUSION

To improve the effectiveness of LP management, CBs need to refine the contents of LP management, from strategic planning of LP management, development of LP management policies, organization of the LP management apparatus to the implementation of LP management. In the research sections of the dissertation, the author has analyzed and evaluated the current state of LP management at BIDV and proposed solutions for improvement for BIDV as well as making some recommendations to relevant state agencies.

Firstly, the dissertation has systematized and clarified the theoretical basis of lending activities, LPs, and LP management of CBs.

Secondly, the dissertation has analyzed and evaluated the current state of LPs and LP management at BIDV in the period 2019-2025. In addition, the dissertation uses the ARDL regression method with 80 observations collected from BIDV's financial statements and some indicators published by the Vietnam Statistics Office for the period 2006-2025 to assess the factors affecting the risk of BIDV's LP (represented by the non-performing loan ratio). From there, the dissertation has pointed out the achievements, limitations, and causes of these limitations in LP management at BIDV.

Thirdly, the dissertation proposes nine solutions to enhance LP management at BIDV through 2030, including: (i) Perfecting the LP management strategic framework and strengthening the alignment between strategy and operational execution; (ii) Refining the LP management policy system; (iii) Refining and improving the efficiency of the LP management organizational structure; (iv) Improving LP management planning and implementation processes; (v) Enhancing the effectiveness of LP management monitoring; (vi) Refining LP management adjustment methods and tools to ensure a proactive approach and optimize the risk-return profile; (vii) Strengthening BIDV's financial capacity and capital allocation efficiency in LP management; (viii) Developing human resources to meet the requirements of modern LP management and international integration; and (ix) Accelerating the application of digital technology and data in LP management.

Furthermore, to facilitate BIDV's implementation of the proposed solutions, the researcher puts forward recommendations for the Government and the State Bank of Vietnam.

LIST OF THE AUTHOR'S PUBLICATIONS RELATED TO DISSERTATION TOPIC

I. Scientific works published in the Journal

1. Nguyen Thi Thuong Giang (2026) “Refining Loan Portfolio Management at the Joint Stock Commercial Bank for Investment and Development of Vietnam”, Journal of Finance and Accounting Research, Issue 1 – October (No. 321) 2026, ISSN: 1859-4093
2. Nguyen Thi Thuong Giang (2025) “Applying risk management theories in loan portfolio management at commercial banks”, Journal of Finance and Accounting Research, Issue 2 - August (No. 294) 2025, ISSN: 1859-4093
3. Nguyen Thi Thuong Giang, Nguyen Son Hai (2025) “Solutions to improve the effectiveness of implementing interest rate support policies from the state budget through the Vietnamese commercial banking system”, Journal of Finance and Accounting Research, Issue 1 – December (No. 301) 2025, ISSN: 1859-4093
4. Mai Thi Trang, Nguyen Thi Thuong Giang (2024) “State management of bad debts at Vietnamese commercial banks”, Journal of Finance and Accounting Research, Issue 2 – December (No. 278) 2024, ISSN: 1859-4093

II. Scientific papers published in conference proceedings (International and Academy of Finance level)

1. Nguyen Thi Thuong Giang (2025) “Strengthening the loan portfolio management of Vietnamese commercial banks in the current context of private economic development”, Proceedings of the International Conference “The Seventh International Conference on Finance and Accounting for the Promotion of Sustainable Development in the Private Sector (FASPS7)”, Academy of Finance, September 2025, ISBN: 978-604-79-5249-6, Economics and Finance Publishing House (EFPH).
2. La Thi Lam, Nguyen Thi Thuong Giang (2025) “Operational safety of the banking system – perspectives on the merger and consolidation of Vietnamese commercial banks”, Proceedings of the Academy of Finance-level conference “The role of financial institutions in sustainable economic development in Vietnam”, Academy of Finance, October 2025, ISBN: 978-604-79-5212-0, Finance Publishing House.
3. Nguyen Thi Thuong Giang (2025) “Loan portfolio at the Joint Stock Commercial Bank for Investment and Development of Vietnam”, Proceedings of the Academy of Finance-level conference “The role of financial institutions in sustainable economic development in Vietnam”, Academy of Finance, October 2025, ISBN: 978-604-79-5212-0, Finance Publishing House.