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Research on the Development of Green Credit of Chinese Commercial Banks

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Abstract

In the context of global initiatives to mitigate climate change and promote sustainable development, green finance has emerged as a critical component in the transformation and modernization of China's financial system. Among its various instruments, green credit serves as the cornerstone of commercial banks' green finance portfolios, playing a pivotal role in channeling capital toward energy efficient and environmentally sustainable industries while facilitating the transition to a low-carbon economy. This study systematically examines the development trajectory and sectoral investment patterns of green credit in Chinese commercial banks from 2018 to 2024. The results reveal that the overall balance of green credit has experienced sustained and robust growth, with financial resources increasingly shifting from traditional sectors such as energy and transportation to emerging industries, including clean manufacturing, energy efficient construction, and circular economy initiatives. Despite this progress, several structural challenges persist, including insufficiently detailed policy frameworks and incentive systems, limited internal motivation and professional expertise within banks, pronounced product and service homogeneity, and inadequate innovation capacity. To address these constraints, the paper proposes enhancing the policy and regulatory framework, establishing a multi-level incentive mechanism, strengthening banks' strategic orientation and professional competencies, and fostering innovation in green financial products and services. These measures are essential for advancing the high-quality and sustainable development of green credit within China's commercial banking sector.

Keywords: Commercial Bank; Green Finance; Green Credit; Sustainable Development

1. Introduction

In recent years, the intensification of global climate change has prompted nations worldwide to accelerate the transition toward green and low carbon economic development. As a vital component of the financial system, commercial banks play an essential role in supporting high-quality economic growth and promoting ecological sustainability. Within this context, green finance particularly green credit has emerged as a key policy instrument for channeling financial resources toward environmentally friendly and energy efficient industries.

Following the proposal of China's dual carbon goals aiming to achieve carbon peaking by 2030 and carbon neutrality by 2060 the Chinese government has introduced a series of financial and regulatory measures to guide capital flows toward green and low-carbon sectors. Commercial banks, serving as the main conduit of green finance, have actively responded by establishing specialized green finance departments, launching diverse green credit products, and improving risk assessment and management systems. These developments have contributed to the rapid expansion and gradual optimization of the green credit structure across the banking sector (Yiruhan & Gantulga, 2025).

Despite these achievements, several persistent challenges remain. Current policy frameworks and incentive mechanisms are still not sufficiently refined to ensure effective implementation. Many commercial banks exhibit limited internal motivation, inadequate expertise in environmental risk assessment, and a lack of innovation in product design. Furthermore, green credit remains concentrated in traditional sectors, with relatively limited penetration into emerging green industries such as clean manufacturing, renewable energy, and circular economy initiatives.

Although existing studies have examined the evolution and performance of China's green finance system, most have focused on macro-level policy effects or case-specific evaluations of individual banks. There remains a shortage of systematic, data-driven analyses that comprehensively assess the developmental trends, structural patterns, and emerging challenges of green credit across Chinese commercial banks over recent years. In particular, limited research has explored how sectoral investment distribution has shifted under the dual carbon policy framework and what institutional constraints continue to hinder innovation and differentiation within green credit operations.

To address these gaps, this paper systematically analyzes the current status, industry investment trends, and structural characteristics of green credit in Chinese commercial banks from 2018 to 2024. It further investigates underlying institutional and operational challenges and proposes actionable policy and managerial recommendations. The findings aim to contribute both theoretically and practically by informing regulators seeking to refine policy mechanisms, guiding banks in optimizing strategic positioning and risk management, and supporting China's broader

objective of achieving the coordinated advancement of economic growth and environmental sustainability.

2. Literature Review

2.1 Conceptual Framework of Green Credit

Research both domestically and internationally consistently acknowledges that green credit plays a pivotal role in fostering corporate green innovation and facilitating industrial restructuring through mechanisms of capital constraint and financial incentive. The theoretical foundation of green credit can be traced to the Equator Principles (2003), which require financial institutions to conduct environmental and social risk assessments in large-scale project financing and to incorporate these results into credit decision-making. Within this framework, early scholarship primarily approached green credit from a risk management perspective. Jeucken (2001), in Sustainable Finance and Banking, conceptualized green credit as a defensive strategy that enables banks to mitigate environmental risks particularly compliance and reputational risks through rigorous credit screening mechanisms that prevent capital from flowing into environmentally hazardous projects.

As the concept of sustainable development gained global prominence, the role of green credit evolved from passive "risk avoidance" toward proactive "value creation." The World Bank's (2012) Inclusive Green Growth report redefined green credit as "loan to projects or activities that generate significant environmental benefits," emphasizing its allocative function in channeling resources toward environmental protection, clean energy, and sustainable industries. Nandy and Lodh (2012) further posited that green credit should integrate environmental performance indicators such as energy conservation, emission reduction, and governance into lending criteria, offering preferential interest rates to green enterprises while imposing financing constraints on polluting industries. Similarly, Scholtens (2017) found that when banks embed environmental standards into lending practices, corporate environmental disclosure and social responsibility performance improve significantly.

2.2 Green Credit in the Chinese Context

In China, the development of green credit is strongly shaped by national policy frameworks. The "Guiding Opinions on Building a Green Financial System" (2016), issued by the People's Bank of China alongside seven other ministries and commissions, provided the first authoritative definition of green credit as "financial services provided to support economic activities that improve the environment, address climate change, and conserve and efficiently utilize resources." This broad definition integrates financing, operations, and risk management across sectors such as environmental protection, clean energy, green transportation, and green buildings.

Empirical studies highlight both the financial and strategic benefits of green credit adoption. He Lingyun et al. (2018) demonstrated that implementing green credit policies enhances banks' return on total assets and overall competitiveness. Lian et al. (2022) further found that such policies improve the return on interest-bearing assets, thereby boosting financial performance. He Dexu and Cheng Gui (2022) emphasized that green credit constitutes an innovative financial supply mechanism that must be coordinated with carbon markets, fiscal tools, and taxation systems to form a cross sectoral synergy.

Overall, while international research on green credit emphasizes market-oriented mechanisms, risk control, and global governance standards, domestic Chinese research tends to align more closely with national strategies, prioritizing macroeconomic regulation, policy driven initiatives, and social welfare outcomes. Despite notable progress, systematic analyses of the structural evolution, sectoral allocation, and institutional challenges of green credit in Chinese commercial banks remain relatively limited. Recent studies have confirmed that green governance mechanisms help lower financing costs among high-pollution enterprises in China (Yiruhan et al., 2025).

2.3 Sustainable Development Theory

The concept of sustainable development was first articulated in the World Conservation Strategy (1980) by the United Nations Environment Program, the World Wildlife Fund, and the International Union for Conservation of Nature, and later defined by the World Commission on Environment and Development (1987) as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This framework emphasizes the balanced pursuit of economic growth, social equity, and ecological preservation (Yiruhan and Gantulga 2025).

Green finance serves as a vital mechanism linking economic and environmental objectives, and green credit represents its practical application within the banking sector. Jeucken (2001) argued that banks should integrate environmental risk management into credit evaluation to direct funds toward low-risk, sustainable projects. He Dexu and Cheng Gui (2022) expanded on this notion, suggesting that green credit should function as a key policy tool for achieving sustainable development, coordinated with carbon market mechanisms and fiscal incentives to promote environmental improvement and high-quality growth. Consequently, sustainable development theory provides both the value orientation and theoretical foundation for Chinese commercial banks to align profitability with ecological responsibility.

2.4 Equator Principles

The Equator Principles (EPs), established by the International Finance Corporation (IFC) in 2003, represent a globally recognized benchmark for environmental and social risk management in the financial sector. They aim to ensure that large-scale project financing achieves a balance between economic efficiency, social responsibility, and environmental protection. The theoretical essence of the EPs lies in the principle of responsible financing, which emphasizes integrating environmental and social considerations into financial decision-making.

Weber et al. (2010) argue that by addressing information asymmetry and establishing standardized environmental and social risk management (ESRM) frameworks, the EPs enable financial institutions to more effectively identify and mitigate potential credit risks. In doing so, they strengthen banks' capacity for risk control and long-term sustainability.

As a cornerstone of international green finance governance, the Equator Principles embody the global consensus that financial institutions must balance profit generation with ecological stewardship. Their core concepts align closely with China's "dual carbon" goals and the ongoing construction of its green financial system, providing both theoretical grounding and practical guidance for advancing green credit development in Chinese commercial banks.

While prior studies have established the theoretical basis for green credit through sustainable development and responsible financing frameworks, most existing research either focuses on policy formulation or individual case studies without systematically assessing the evolutionary dynamics, industry structure, and performance outcomes of green credit across China's commercial

banking sector. Furthermore, limited attention has been paid to how institutional constraints, innovation capacity, and policy coordination jointly shape the effectiveness of green credit implementation.

Therefore, this study seeks to fill this research gap by conducting a comprehensive, longitudinal analysis of green credit development in Chinese commercial banks from 2018 to 2024 examining industry distribution trends, structural characteristics, and the institutional factors influencing its growth trajectory. The findings aim to enrich theoretical understanding and provide actionable insights for policymakers and financial institutions to enhance the sustainability and competitiveness of China's green finance system.

3. Research Methodology

This study adopts a mixed descriptive analytical research design that integrates quantitative trend analysis with qualitative policy and institutional review. The main objective is to examine the development trajectory, structural characteristics, and policy drivers of green credit in Chinese commercial banks during the period 2018–2024. Following established approaches in sustainable finance research (Scholtens, 2017; He & Cheng, 2022), the study combines macro-level policy evaluation with sectoral investment data to provide a comprehensive understanding of how green credit has evolved under China's "dual carbon" strategy.

The research is based primarily on secondary data collected from multiple authoritative sources. Statistical data were obtained from the annual reports of major Chinese commercial banks, the People's Bank of China (PBOC), and the China Banking and Insurance Regulatory Commission (CBIRC). Sectoral allocation statistics were further supplemented by data from the National Bureau of Statistics (NBS) and the China Banking Association. In addition, policy documents such as the Green Credit Guidelines (2012) and the Guiding Opinions on Building a Green Financial System (2016), as well as reports on regional green finance reform pilot zones, were analyzed to capture the institutional and regulatory environment shaping the growth of green credit. Relevant academic publications and industry reports issued by international organizations such as the World Bank and OECD were also reviewed to situate the Chinese experience within the broader global context.

The analytical process consisted of three stages. First, a policy and institutional analysis was conducted through a content review of national and regional documents to identify the evolution of green credit regulation, incentive mechanisms, and implementation frameworks. Second, descriptive and structural analyses were performed on quantitative data to examine changes in the size, growth rate, and industry distribution of green credit from 2018 to 2024. Comparative indicators were calculated to assess structural shifts in credit allocation from traditional sectors such as energy and transportation toward emerging industries including clean manufacturing, green construction, and the circular economy. Third, the findings from the policy and quantitative analyses were synthesized to diagnose structural bottlenecks, institutional constraints, and innovation gaps in China's green credit system. Through this triangulated approach, both empirical data and policy insights were integrated to form a coherent and evidence-based interpretation.

The main indicators used in this study include the total balance of green credit and its annual growth rate, the sectoral distribution ratio showing the proportion of loans across different industries, the green credit intensity (the ratio of green loans to total loans), and a qualitative index measuring the frequency and depth of green credit policy reforms. Together, these indicators allow for a comprehensive evaluation of the development pattern and institutional dynamics of green credit in the Chinese commercial banking sector.

To ensure the validity and reliability of findings, all data were sourced from official and audited institutions. Cross-validation was conducted among multiple datasets from the PBOC, CBIRC, and commercial bank reports to minimize bias. Qualitative document coding was carried out in two stages to ensure consistency in thematic interpretation and reduce subjectivity. Nevertheless, the study acknowledges certain limitations. Because it relies mainly on secondary data, it may not capture emerging green credit activities among smaller regional banks or newly introduced financial instruments. Furthermore, the lack of firm-level data restricts the ability to establish causal relationships between green credit and corporate environmental performance. Future research may therefore expand upon this work through econometric analysis or case-based field studies to provide deeper insights into the micro-level mechanisms of green credit.

Overall, this methodological approach provides a robust and systematic framework for understanding how green credit has evolved in China's commercial banking system. By integrating statistical analysis with institutional assessment, it enables a nuanced interpretation of both the quantitative progress and qualitative challenges in advancing green financial practices under China's sustainable development agenda.

4. Results

4.1 Continuously Improving the Policy Support System

In recent years, China has gradually established a comprehensive and internationally leading green credit policy framework. At the strategic level, the government's proposal of the "carbon peaking and carbon neutrality" goals provided a clear long-term direction for the development of green finance and laid the groundwork for integrating environmental objectives into the financial system. At the regulatory level, standardized operational frameworks have been successively introduced from the issuance of the Green Credit Guidelines (2012) to the establishment of a national green credit statistical and monitoring system creating consistent benchmarks for banks to evaluate and manage environmentally oriented lending activities.

From an incentive perspective, the People's Bank of China (PBOC) has incorporated green credit performance into the Macroprudential Assessment (MPA) system and introduced carbon emission reduction support tools to effectively guide the allocation of credit resources toward low-carbon and environmentally beneficial sectors. In parallel, the implementation of green finance reform and innovation pilot zones across various provinces has provided localized experimentation platforms for policy refinement and institutional innovation, thereby strengthening the adaptability and effectiveness of national policies.

This multi-tiered and multi-dimensional policy architecture combining strategic guidance, regulatory standardization, and incentive mechanisms has created a favorable institutional environment for the rapid expansion and structural optimization of green credit within China's commercial banking sector. It not only enhances the alignment between national carbon goals and financial operations but also reinforces the role of commercial banks as key intermediaries in promoting sustainable economic transformation. The key milestones and institutional measures established by relevant Chinese authorities are summarized in Table 1, which outlines the evolution of the green credit policy framework.

Table 1. List of China's Green Credit Policies

Time	Policy document name	Issuing authority
2007	《Opinions on Implementing Environmental Protection Policies and Regulations to Prevent Credit Risks》	Former China Banking and Insurance Regulatory Commission, State Environmental Protection Administration, People's Bank of China
2012	《Green Credit Guidelines》	Former China Banking and Insurance Regulatory Commission
2013	《Green Credit Statistics System》	Former China Banking and Insurance Regulatory Commission
2014	《Key Evaluation Indicators for Green Credit Implementation》	Former China Banking Regulatory Commission
2016	《Guiding Opinions on Building a Green Financial System》	The Ministry of Finance, the People's Bank of China and other seven ministries and commissions
2018	《Green Loan Special Statistics System》	People's Bank of China
2020	《Green Bond Support Project Catalogue (2020 Edition)》	People's Bank of China, National Development and Reform Commission, China Securities Regulatory Commission
2021	《Green Finance Evaluation Scheme for Banking Financial Institutions》	People's Bank of China
2022	《Green Finance Standard System》	People's Bank of China, former China Banking and Insurance Regulatory Commission
2024	《Opinions on Leveraging Green Finance to Serve the Construction of a Beautiful China》	People's Bank of China, Ministry of Ecology and Environment, Financial Regulatory Administration, China Securities Regulatory Commission

Data source: Official websites of various regulatory agencies

4.2 The scale of green credit continues to grow

With the improvement of green credit policies and systems, my country has entered a period of rapid development, with its scale steadily increasing and ranking first globally. As shown in Figure 1, the balance of green credit by Chinese commercial banks was 8.23 trillion yuan in 2018. It rose to 10.22 trillion yuan in 2019, a year-on-year increase of approximately 24%. It further increased to 11.95 trillion yuan in 2020, a year-on-year increase of approximately 17%. In 2021, it jumped to 15.90 trillion yuan, with the growth rate significantly accelerating. In 2022, it exceeded 20 trillion yuan for the first time, reaching 22.03 trillion yuan. It continued to climb to 30.08 trillion yuan in 2023, and reached a new high of 36.60 trillion yuan in 2024. Overall, the cumulative growth of green credit balances over the past six years exceeded 340%, demonstrating a remarkable leapfrog expansion. This leapfrog expansion is primarily due to the top-level guidance of the "dual carbon" goals, the strengthening of regulatory assessment and incentive tools, and the improvement of banks' internal green finance governance and product systems. Green credit has become a key financial tool for my country's banking system to support low-carbon transformation and sustainable development.

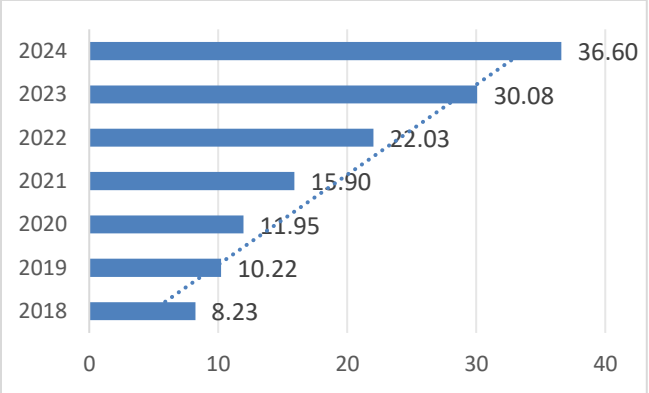

Figure 1: China's Green Credit Development, 2018-2024 (Unit: Trillion RMB)

Source: People's Bank of China official website

In terms of industry investment, China's green credit allocation is primarily divided into two main categories: direct carbon emission reduction and indirect carbon emission reduction. These two categories are further subdivided into multiple industry categories, including several "other" sectors not listed separately. Overall, green credit investment is diversified, rather than monolithic.

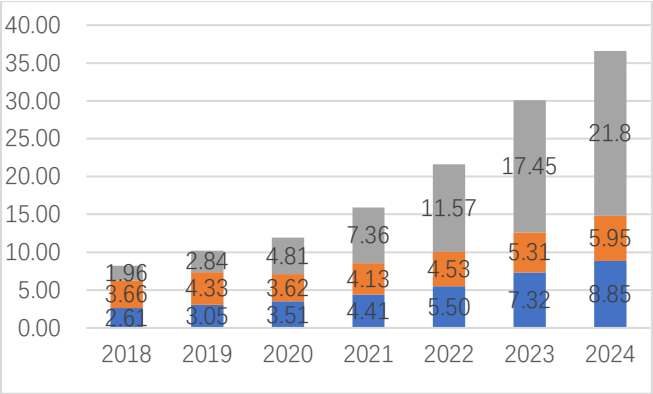

Figure 2: China's Green Loan Industry Investment Statistics, 2018-2024

Source: People's Bank of China Official Website

As shown in Figure 2, from 2018 to 2024, the balance of green loans to the electricity, heat, gas, and water production and supply industries (blue) increased from approximately 2.6 trillion yuan to approximately 8.85 trillion yuan. Although this proportion has declined slightly, it remains a fundamental pillar of green credit, with growth primarily driven by projects such as new energy power generation, clean energy supply, and energy-saving renovations. The transportation, warehousing, and postal industries (orange) saw a relatively steady increase from approximately 3.66 trillion yuan to approximately 5.95 trillion yuan, reflecting continued investment in new energy vehicles, rail transit, and green logistics, indicating that the construction of a green transportation system is progressing steadily. The "other industries" (yellow) saw the most significant increase, jumping from approximately 1.96 trillion yuan to approximately 21.8 trillion yuan, a more than tenfold increase in six years. These sectors cover emerging areas such as clean manufacturing, energy-efficient buildings, environmental services, and the circular economy, demonstrating that green credit is rapidly expanding from traditional energy and transportation sectors to a more diversified green industrial system.

4.3 Continuous Innovation in Green Finance Products

To actively respond to the national "dual carbon" strategic goals and meet the market's increasingly diverse green financing needs, major commercial banks have launched a variety of green credit products, taking into account regional characteristics and their own operating conditions. Table 2 lists some of these commercial bank products, demonstrating that their business portfolio is primarily focused on environmentally friendly loans and other products.

Table 2. Overview of Green Credit Products of Some Commercial Banks in China

Bank Name	Green credit products
Bank of China	CDM Clean Development Mechanism, future income rights pledge financing project products
Agricultural Bank of China	"Five Water Co-governance Special Loan", Green Loan + Camellia Oil Loan
Industrial and Commercial Bank of China	Green bond underwriting, green financial leasing, and industrial funds
China Construction Bank	"Green Steward" service, carbon emission rights pledge loan, "Belt and Road" themed green bonds
Bank of Communications	Carbon emission trading pilot, future revenue pledge financing, contract energy management
Postal Savings Bank of China	Energy vehicle consumer loans, "Youhao Loan", "Green Creation Loan", and green financial bonds
Bank of Jiangsu	"Photovoltaic Loan", "Low Emission Loan", "Water Saving Loan"
China CITIC Bank	Green special and sustainable development-linked syndicated loans, and "green car consumer loans"
Shanghai Pudong Development Bank	IFC Energy Efficiency Loan, ADB Building Energy Efficiency Loan
China Merchants Bank	French Development Agency green refinancing, pollution emission rights mortgage loans, green equipment buyer's credit
Bank of Beijing	"Beijing Green Finance" and "Energy Saving Loan"
Bank of Shanghai	"Green and Low-Carbon Themed Credit Card", "Sunshine Loan"

Source: official websites of major commercial banks

4.4 Increasingly Diverse Participants Create a Differentiated Landscape

China's commercial banks' green credit initiatives have evolved from "pioneer-led" initiatives to "universal follow-up." Early on, they were primarily driven by two types of pioneers: policy banks such as China Development Bank, leveraging state credit and long-term funding to support medium- and long-term projects such as clean energy and ecological governance, playing a leading role. Joint-stock banks such as Industrial and Commercial Bank of China (ICBC) adopted the Equator Principles and partnered with the International Financial Cooperation Commission (IFC) for energy efficiency financing, exploring market-based approaches and building a first-mover advantage. With the strengthening of the "dual carbon" goals and regulatory guidance, green credit has shifted from an "optional" to a "compulsory" initiative. Major state-owned banks such as ICBC, ABC, CCB, Bank of China, and Postal Savings Bank of China (PTI) have leveraged their capital, customer base, and network advantages to fully capitalize on this initiative, rapidly expanding its scale. Meanwhile, local institutions such as city commercial banks and rural commercial banks have adapted their strategies to regional advantages: in the eastern region, they have focused on green manufacturing upgrades and distributed photovoltaics, while in the western region, they have prioritized ecological protection, forestry carbon sequestration, and sustainable agriculture and animal husbandry. This top-down and bottom-up integration has fostered a multi-tiered green credit system with diverse stakeholders, clear divisions of labor, and extensive coverage.

5. Discussion

The findings of this study reveal that while China has made remarkable progress in establishing a robust green credit system, significant institutional and operational challenges persist within its commercial banking sector. The results highlight three interrelated barriers that constrain the high-quality development of green credit: inadequate policy and incentive frameworks, insufficient internal motivation and expertise within banks, and weak product innovation capacity.

First, despite the establishment of foundational policies such as the Green Credit Guidelines and the Special Statistical System for Green Loans, the current policy standards remain fragmented and lack precision, especially in emerging domains such as transition finance, low-carbon transformation, and green supply chain finance. This ambiguity not only complicates pre-loan screening and post-loan evaluation but also creates space for "greenwashing," undermining policy credibility and market trust. In addition, while macroprudential assessment tools have improved oversight, the absence of consistent fiscal subsidies, tax incentives, and risk compensation mechanisms limits banks' willingness to allocate capital to high-risk, long-term green projects.

Second, the study finds that internal organizational and capacity constraints remain a key obstacle. Many commercial banks continue to perceive green credit as a compliance task rather than a strategic business opportunity, leading to limited resource allocation and weak performance incentives. This lack of strategic prioritization, combined with a shortage of interdisciplinary professionals skilled in both finance and environmental science, has impeded innovation in green financial products and weakened environmental risk management. Without strengthening their internal human capital and technical expertise, banks will struggle to align profitability with environmental objectives.

Third, the homogeneity of green credit products reflects the sector's limited innovation capacity. Most commercial banks still focus on traditional project loans for large-scale renewable energy and infrastructure projects, while new areas such as carbon finance, green consumption finance, and SME-oriented green technology lending remain underdeveloped. This narrow product mix fosters low-level competition, restricts financial inclusion for smaller enterprises, and inhibits the diversification of green finance instruments needed to accelerate industrial transformation.

Taken together, these findings underscore the need for an integrated policy market institution approach to strengthen the coherence of green credit development. The establishment of unified and adaptive classification standards, multi-tiered fiscal and tax incentives, and enhanced risk-sharing mechanisms could effectively address external constraints. Meanwhile, improving banks' strategic positioning, internal training, and collaboration with research institutions would strengthen their capacity for innovation and risk assessment. Finally, fostering differentiated product and service innovation such as carbon-rights collateral lending, supply chain finance, and green consumer credit would enhance competitiveness and inclusivity in the green credit ecosystem.

6. Conclusion

This study systematically examined the development trends, policy frameworks, and institutional challenges of green credit in Chinese commercial banks between 2018 and 2024. The results demonstrate that the overall scale and structural composition of green credit have improved substantially, reflecting its growing importance as a financial instrument for promoting China's low-carbon and sustainable economic transition. Nonetheless, the analysis also reveals several persistent weaknesses in policy design, internal bank capabilities, and innovation capacity. To advance the high-quality development of green credit, it is essential to strengthen policy coordination, improve standardization, and establish a comprehensive incentive framework that combines regulatory, fiscal, and market-based measures. At the institutional level, commercial banks should elevate green finance to a strategic priority, invest in capacity building for interdisciplinary talent, and embed sustainability metrics into performance evaluations. At the operational level, banks must promote product and service innovation to meet the financing needs of diverse industries and customer groups, thereby enhancing their competitive differentiation and long-term resilience. The successful implementation of these measures will contribute not only to the sustainable growth of China's financial system but also to the broader realization of the country's "dual carbon" goals and its commitment to global environmental governance.

7. Limitation

Although this study provides a systematic analysis of the evolution and structural dynamics of green credit in Chinese commercial banks, several limitations should be acknowledged. First, the study relies primarily on secondary data, which may not fully capture emerging financial innovations or regional variations in policy implementation, especially among small and medium-sized banks. Second, the research focuses on institutional and structural factors rather than firm-level or borrower-level impacts, limiting its ability to measure the direct environmental and economic outcomes of green credit. Third, while qualitative and descriptive analyses provide valuable insights, quantitative econometric modeling could further clarify causal relationships between policy instruments, credit allocation efficiency, and green innovation outcomes.

Future research could address these limitations by employing micro-level datasets, panel regression models, or case study approaches to evaluate the performance and risk characteristics of specific green credit products. In addition, comparative studies across different regions or emerging economies could enhance understanding of how institutional contexts influence the effectiveness of green credit mechanisms. Such work would deepen theoretical understanding of green finance and provide empirical evidence to support the continuous improvement of China's green financial system.

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