

Research on the Risk Management of Commercial Bank Green Bonds under the "Dual Carbon" Goals

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Abstract: Against the backdrop of the "carbon neutrality and carbon peak" dual carbon goals, as mentioned in relevant studies, the importance of green bonds to the sustainable development of commercial banks has become increasingly prominent and has become a key financial means to promote their green development. This is an important feature of the green finance field at the current stage of development. However, there are certain risks in using green bonds as a green financial tool at present, and these risks may stem from various factors such as market uncertainty and project complexity. Therefore, research on the risk management of commercial bank green bonds is not only an inevitable choice for commercial banks to achieve sustainable development but also a key link in ensuring China's social and economic development. The research results will have a profound impact on the financial industry and the overall economic situation. The proposal of the dual carbon goals has not only provided new opportunities for the development of green bonds, such as attracting more social capital to invest in green projects, but also provided a new direction for the risk management of commercial banks, prompting banks to shift from traditional risk assessment to comprehensive risk management that combines environmental and social factors. This paper aims to analyze the new development opportunities for commercial banks under the dual carbon goals, explore the significance of commercial bank-issued green bonds in promoting the achievement of the dual carbon goals, as well as their mutual effects, and elaborate on the specific paths through which green bonds empower the risk management of commercial banks. Meanwhile, this paper will put forward relevant development suggestions for commercial bank risk management, with the expectation of providing references for commercial banks to build exchange rate risk management systems.

Keywords: Green Bonds, Commercial Banks, Risk Management.

1. Introduction

In the macro context of the increasingly severe global climate change, the "carbon peak and carbon neutrality" dual carbon goals have become the common development direction of countries around the world. This goal is an important strategic deployment for the global response to the challenges of climate change, covering the transformation and changes in multiple fields such as the economy, society, and environment. As a core area in the modern economy's financial field, commercial banks shoulder significant responsibilities and face severe challenges in promoting the achievement of the "dual carbon" goals. Currently, under the traditional model of commercial banks, there are various problems in their risk management, such as incomplete identification, lagging assessment methods, and single control means. These problems often lead to insufficient responses when banks face complex and changeable market environments and emerging risks. Green bonds, as an important green financial tool, provide a new opportunity for commercial banks to improve their risk management systems and achieve sustainable development. They play a unique role in guiding capital flows to green projects and promoting the development of green industries.

In recent years, China's commercial banks have actively issued various green bonds, providing long-term and stable sources of funds for projects in fields such as environmental protection, clean energy, and sustainable development, and have played an active role in promoting the development of the green economy. However, China's green finance system is still imperfect. In the development process of the green bond market, its risk management issues have become increasingly

prominent. On the one hand, green projects involved in green bonds often have long investment cycles and high uncertainties, which undoubtedly bring multiple challenges such as credit risks, market risks, and environmental risks to commercial banks. For example, some green projects may face situations where returns fail to meet expectations due to immature technologies or changes in market demand. On the other hand, as Zhang Qinfeng and Xiong Yansha (2024) pointed out in a report, the decline in the issuance volume of green bonds has brought new challenges to bank risk management. Since the green bond market is in the initial stage of development, relevant policies, regulations, standard systems, and assessment mechanisms are still not sound enough, further increasing the difficulty of commercial bank risk management. This highlights the necessity of in-depth research on this issue. In view of this, with the theme of "Research on the Risk Management of Commercial Bank Green Bonds under the 'Dual Carbon' Goals", this paper deeply explores how commercial banks use green bonds as a green financial tool for risk management and analyzes the empowerment paths of green bonds for commercial bank risk management, aiming to provide commercial bank managers with reference suggestions with profound theoretical value and help commercial banks achieve stable development under the guidance of the "dual carbon" goals.

2. The Necessity of Building a Risk Management System under the Dual Carbon Goals

2.1. Analysis of the Current Situation of Commercial Banks

Commercial banks play a key role in safeguarding financial stability in China's financial system. They are both risk bearers and risk managers and are at the core of financial risk prevention and control. The stable operation of commercial banks is crucial to the stability of the entire financial market, and any risk event may trigger a chain reaction. However, the current situation of the green bond market is not optimistic. According to institutional statistics, in the first half of 2024, the number of green bond issuances in China decreased by 14.96% year-on-year, and the issuance amount decreased by 46.75% year-on-year. This is the second consecutive decline since 2023 - in 2023, 479 new green bonds were added in China, a year-on-year decrease of 15.67% [1]. This downward trend in issuance volume and amount not only reflects market fluctuations but also increases the credit risk and market risk of commercial banks. Because the reduction in issuance volume may mean that market confidence in green bonds has been hit or that there are fewer high-quality green projects, which may lead commercial banks to face greater risks in green bond investments. It can be seen that it is urgent for commercial banks to build a risk management system, which is a key measure to ensure their own stable operation and respond to market changes.

2.2. New Opportunities for Risk Management - Green Bonds

Green bonds are bonds issued to raise funds for supporting green projects that meet specified conditions. Their main role is to provide long-term and stable financial support for enterprises, enabling green projects to obtain the necessary funds for construction and operation and promoting the development of green industries. Under the wave of the dual carbon goals, green bonds have created new opportunities for commercial banks to build risk management systems. For commercial banks, green bonds have broadened business boundaries. By leveraging their risk dispersion function, they prompt commercial banks to optimize their risk management models to achieve sustainable development. Meanwhile, commercial banks can use their risk dispersion characteristics to optimize investment portfolios and reduce risks brought about by fluctuations in single assets. For example, commercial banks can transfer part of their funds from traditional high-risk areas to the green bond area to optimize asset allocation. For green bonds, on the one hand, commercial banks conduct strict reviews and continuous tracking of the credit status and project feasibility of green bond issuers, reducing market fluctuations caused by issuer defaults and effectively lowering default risks. In this process, commercial banks utilize their professional advantages and risk assessment systems to conduct comprehensive evaluations of issuers to ensure the quality of green bonds. On the other hand, commercial banks accurately guide capital flows to green projects that truly have environmental benefits and development potential to ensure the rational allocation of resources and contribute to the achievement of the "dual carbon" goals. Ye Peijie et al. (2024) took Industrial Bank as an example and found that the rational use of green bonds can

have a positive impact on bank risk management, such as improving risk resistance ability and optimizing asset quality [2].

3. The Mechanism of Green Bonds in Building the Risk Management System of Commercial Banks

3.1. Mechanism Analysis from the Perspective of the Capital Guidance Role

In the process of building the risk management system of commercial banks, the capital guidance role played by green bonds is of vital importance. In the current situation of increasingly strict environmental regulations, the traditional investment and financing model, due to its own limitations, can no longer meet the capital needs of enterprises for green transformation. When evaluating the risks and returns of green projects, the traditional model often lacks targeted methods and standards. The emergence of green bonds just fills this crucial gap and provides a specialized financing channel for green projects. Green bonds play their capital guidance role to guide commercial banks to carry out targeted services, accurately allocate funds to green projects and emerging green enterprises, and promote the orderly transfer of funds from high-emission and high-pollution enterprises, thereby fundamentally optimizing the capital investment structure of commercial banks. Through this optimization, commercial banks effectively avoid the deterioration of asset quality caused by the potential risks of high-pollution enterprises. High-pollution enterprises often face significant environmental policy risks, market risks, and social public opinion risks. For example, the tightening of environmental policies may lead high-pollution enterprises to face high environmental fines or production suspensions and rectifications, and the negative evaluation of high-pollution enterprises by social public opinion may also affect their market image and operating conditions. The adjustment of capital investment guided by green bonds ensures the green attributes and security of bank assets and lays a solid foundation for commercial banks to build a more robust and risk-resistant risk management system.

3.2. Mechanism Analysis from the Perspective of the Risk Diversification Function

From the perspective of credit risk diversification, in the government-led green bond market, a series of policy interventions play a key role. For example, through the implementation of tax cuts, subsidies, and other policies, the green bond system is upgraded, effectively reducing the risks of enterprises' green innovation activities. Meanwhile, the government's policy support provides a good development environment for green enterprises, reducing the costs and risks of enterprises in the green innovation process. However, since enterprises are the issuers of green bonds, their risk levels are closely related to the credit risk of commercial banks. Credit risk mainly depends on the solvency and willingness of issuers to repay debts. The policies related to green bonds provide strong support for enterprises in the green innovation process, enabling them to have more stable financial conditions and good development prospects. As a result, the solvency and willingness of enterprises to repay debts are more guaranteed, directly reducing the credit risk faced by commercial banks and making commercial banks'

investments in green bonds more secure. In terms of business risk diversification, the state provides policy protection for the transformation of green patent achievements and sets up special funds to support them. If green patent achievements can be successfully transformed, the profitability and competitiveness of enterprises will be enhanced, thereby reducing the business risk of enterprises. As investors in green bonds, commercial banks will be indirectly affected by the reduction in enterprise business risks, and the risks they face will be correspondingly reduced. When enterprises become more stable on the green development path, the security of commercial banks' investments in green bonds is significantly improved, and business risks are effectively diversified. Yang Haoyuan (2024) also emphasized in his research the impact of policies on the risks of green bond issuers and their association with the credit risk of commercial banks, pointing out that policy support is an important factor in promoting the healthy development of the green bond market and reducing bank risks [3]. This diversification mechanism is of great significance for the stability and improvement of the commercial bank risk management system, enabling commercial banks to better cope with credit and business risks in the face of complex and changeable market environments.

4. Specific Paths for Green Bonds to Empower the Risk Management of Commercial Banks

4.1. Optimize Resource Allocation

The development of the green bond market has prompted commercial banks to reallocate business resources, which is mainly reflected in two key aspects and has created conditions for optimizing resource allocation at the regional level, comprehensively assisting commercial bank risk management. In terms of tilting business resources towards green finance, first, increase the cultivation and introduction of green finance professionals. Commercial banks form professional teams responsible for green bond-related businesses, covering aspects such as project evaluation and risk monitoring, effectively enhancing their ability to control risks in green projects. As the complexity of green finance business increases, the demand for professionals is becoming more and more urgent. Professionals can use advanced evaluation methods and technologies to accurately evaluate green bond projects. Second, increase investment in research on green industries and technologies. Gain an in-depth understanding of their development trends and market dynamics, enabling commercial banks to more accurately identify and evaluate the risks and returns of green bond projects and achieve rational resource allocation. In terms of realizing the rational layout of cross-regional resources, green bonds have created favorable conditions for commercial banks to optimize resource allocation. They can guide funds to flow from regions with saturated resources or high risks to regions with green development potential. Through cross-regional green bond investments, commercial banks can disperse risks over a larger geographical range, effectively avoiding concentrated risks to commercial bank assets caused by a single regional economic structure or local economic fluctuations, and enhancing the stability of overall risk management. More importantly, this cross-regional resource allocation is conducive to promoting the coordinated development of green industries among regions, forming a

virtuous cycle of green economic development, and further consolidating the foundation of commercial bank risk management, providing a strong guarantee for the sustainable development of commercial banks. For example, in economically underdeveloped regions rich in green resources, green bonds can guide funds to flow in, promote the development of local green industries, and also bring new business growth points and risk dispersion opportunities for commercial banks.

4.2. Strengthen Risk Identification and Evaluation

The issuance of green bonds follows strict environmental, social, and governance (ESG) standards, which provide strong support for commercial banks to strengthen risk management, mainly reflected in two aspects: improving the dimension of risk identification and strengthening the ability of risk assessment. In terms of improving the dimension of risk identification, first, the environmental dimension. Green bonds are precisely targeted at green projects for energy conservation, emission reduction, and sustainable resource utilization. Based on this, commercial banks can effectively identify environmental risks. The impacts of changes in environmental regulations, natural disasters, and other factors on green projects can all be included in the scope of risk consideration, enabling banks to have a clearer insight into environmental risks. For example, stricter restrictions on carbon emissions in environmental regulations may affect the costs and returns of green projects, and natural disasters may damage the infrastructure of green projects. Second, the social dimension. Since green bonds pay attention to the impact of projects on communities and employment, commercial banks can accordingly keenly detect social risks, including risks that may be triggered by social public opinion and community resistance, and make preparations in advance. For example, if a green project does not fully consider the interests of the local community during the construction process, it may trigger community resistance and affect the project progress and returns. Third, the governance dimension. The governance structure requirements of green bond issuers provide a basis for commercial banks to identify governance risks, helping banks discover problems such as poor management and information opacity, thus making risk identification more comprehensive and accurate. A reasonable governance structure can ensure the scientific decision-making and operational transparency of issuers and reduce the investment risks of banks.

In terms of strengthening the ability of risk assessment, green bonds play a key role with the help of the information disclosure mechanism. Green bond issuers are required to regularly disclose reports on the use of raised funds, project progress, and environmental benefits. By analyzing the reports on the use of raised funds, commercial banks can accurately judge whether projects are progressing as planned and whether there are problems of fund misappropriation. Meanwhile, based on the data of project progress and environmental benefits, commercial banks can evaluate the differences between the actual and expected situations of projects, timely discover risk points such as project delays and failure to meet expected environmental benefits. In addition, the information sharing platforms and industry research reports in the green bond market also provide rich reference materials for commercial banks, enabling them to compare the risk statuses of different projects and issuers and achieve

scientific risk assessment, thereby providing solid support for risk management decisions and enhancing banks' ability to cope with risks. Commercial banks can use information sharing platforms to obtain risk information on green bond projects in the same industry and understand industry development trends and potential risks through industry research reports, so as to better formulate risk management strategies.

5. Conclusion

5.1. Summary

Against the backdrop of the global active response to climate change and China's commitment to achieving the "carbon peaking and carbon neutrality" goals, green bonds, as a green financial instrument, are of great significance to the sustainable development of commercial banks. The development of green bonds is an inevitable choice that conforms to the global green development trend and plays a crucial role in promoting the economic transformation towards low-carbon and environmental protection. Judging from the current situation, commercial banks currently have numerous problems in risk management, and the development of the green bond market also faces challenges. However, green bonds have also brought new opportunities to commercial banks. They have not only broadened the business boundaries of commercial banks but also played a positive role in constructing the risk management system in terms of capital orientation and risk diversification. Under the capital orientation function, green bonds have filled the gap in the capital needs of enterprises for green transformation in the traditional investment and financing model, optimized the capital investment structure of commercial banks, and ensured the green attributes and security of bank assets. From the perspective of risk diversification, whether it is the government's policy intervention in the green bond market to reduce credit risk or the state's support for the transformation of green patent achievements to reduce operational risk, both have improved the risk management system of commercial banks. Meanwhile, green bonds empower commercial banks' risk management from two paths: optimizing resource allocation and strengthening risk identification and assessment. In terms of optimizing resource allocation, commercial banks have improved the professionalism and competitiveness of green financial business, enhanced the effectiveness and stability of risk management, and promoted the coordinated development of green industries by tilting business resources towards green finance and realizing the rational layout of cross-regional resources. In terms of strengthening risk identification and assessment, green bonds improve the risk identification dimension based on the ESG standards and strengthen the risk assessment ability with the help of the information disclosure mechanism and other reference materials, enabling commercial banks to better cope with risks and thus ensuring their stable operation in the complex market environment.

5.2. Suggestions and Deficiencies

Although certain achievements have been made in the

research on the risk management of commercial banks' green bonds under the "carbon peaking and carbon neutrality" goals, there are still some deficiencies. Firstly, there are limitations in the timeliness and comprehensiveness of data. Due to difficulties in data acquisition and timeliness issues in the research, even though some recent data have been cited, it is still difficult to fully and accurately present the latest situation of the current green bond market and commercial banks' risk management. Future research needs to expand data source channels and improve data quality and timeliness. The current green bond market is developing rapidly, with new data and information constantly emerging, requiring broader and more timely data collection methods to accurately reflect market dynamics. Secondly, there is a lack of a risk quantification model. When analyzing the impact of green bonds on commercial banks' risk management, the identification, assessment, and response to risks are mostly elaborated from a qualitative perspective, and the in-depth quantitative analysis of risks is insufficient. In the future, a complete risk quantification model needs to be established to accurately measure the impact degree of green bond risks on commercial banks. Quantitative analysis can more precisely evaluate the risk level and provide a more scientific basis for risk management decisions. Finally, there is a lack of international comparative studies. This paper focuses on the relevant situation in China and lacks in-depth analysis of the experiences and cases of other countries in the world in the development of green bonds and commercial banks' risk management. Future research can increase international comparison content and broaden the international perspective to better provide references for the risk management of commercial banks' green bonds in China. Some developed countries in the world have relatively mature experiences in the development of the green bond market and risk management, which are worthy of learning and reference by China. Liu Bingling (2024) put forward relevant countermeasure suggestions for the development of commercial banks' green finance under the "carbon peaking and carbon neutrality" background, which also has implications for the further improvement of this research [4]. For example, in terms of improving market system construction and talent cultivation, its ideas can be borrowed.

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