A Study on the Impact of Green Bond Fund Management on the Financing Efficiency of Real Estate Enterprises

Wenli Hu*

Sichuan Agricultural University, Business and Travel Academy, ChengDu, China

*Corresponding author's email: 1460605014@qq.com

Abstract. Against the backdrop of the "dual carbon" goals and the tightening of real estate financing policies, green bonds have become an important financing tool for the transformation of real estate enterprises. This paper systematically reviews the literature on how green bond fund management affects the financing efficiency of real estate companies. The study finds that green bonds offer advantages in interest rates and maturities, can effectively alleviate information asymmetry, and optimize debt structures. However, in practical management, real estate enterprises face issues such as a lack of transparent management of fund use and low allocation efficiency. Existing literature mainly focuses on macro-level effects and empirical analysis, lacking research on micro-level fund management implementation paths specific to real estate enterprise characteristics. In the future, in-depth case tracking should be conducted to explore the mechanisms through which full-process fund management enhances financing efficiency, in order to guide the green transformation of real estate enterprises.

Keywords: Green bond fund management; financing efficiency; Real estate company.

1 Introduction

Against the backdrop of increasingly severe environmental issues such as global climate change, environmental pollution, and resource depletion, sustainable development has become a global consensus. In the entire life cycle of real estate, the construction waste, dust, and carbon emissions generated during the operation and maintenance of buildings are significant. Statistics show that at peak times, building energy consumption accounts for 40%[1] of the total terminal energy consumption of society. In 2020, China proposed the 'dual carbon' goals, and efforts in environmental governance and green transformation have been gradually promoted. However, the financial support for green construction has developed relatively slowly, and under financing regulatory policies such as the 'three red lines,' traditional financing channels for real estate enterprises have narrowed and investment growth has slowed. In this context, green finance, as an important tool to support green transformation, has seen continuous improvement in its policy system. Among them, green bonds provide a new financing pathway for real estate enterprises, but as of June 2023, the scale of green bonds in the real estate sector

P. S. Borah et al. (eds.), *Proceedings of the 2026 6th International Conference on Enterprise Management and Economic Development (ICEMED 2026)*, Advances in Economics, Business and Management Research 394,
https://doi.org/10.2991/978-94-6239-719-4_29

accounted for only 4%[2] of the national issuance total. Due to issues such as long capital recovery cycles and mismatched risk and return in this sector, it still faces significant challenges in green bond financing. To continuously utilize this financing tool, it is necessary to implement effective management of green bond funds.

2 Institutional Background and Theoretical Basis

2.1 Institutional Background

In 2016, the People's Bank of China issued the "Catalogue of Projects Supported by Green Bonds," marking the official launch of China's green bond market. After the "dual carbon" targets were proposed in 2020, policy support for green bonds was significantly strengthened. The "Catalogue of Projects Supported by Green Bonds (2021 Edition)" released in 2021 unified domestic standards and explicitly included green and sustainable buildings within the scope of support, providing a clear policy basis for real estate companies to issue green bonds. However, there is a mismatch between policy implementation and market practice. On one hand, although green building projects are included in the catalogue, macro-control policies governing the real estate industry's "three red lines" have not offered differentiated financing support for green projects, leading financial institutions to have concerns about the green projects of real estate companies. On the other hand, regulatory requirements for green bonds are increasingly strict, particularly regarding the compliance of the use of raised funds and the completeness of information disclosure. For example, the release of the "Guidelines on Information Disclosure during the Custody Period of Green Bonds" in 2022 requires issuers to conduct transparent disclosure. These institutional requirements not only establish norms for real estate companies to raise funds through green bonds but also pose severe challenges to their fund management capabilities.

2.2 Theoretical Basis

According to the theory of information asymmetry, real estate companies, as debtors, possess the true information about the environmental benefits of green projects and the flow of funds, while investors are at a disadvantage, which can easily lead to adverse selection and moral hazard. High-quality fund management, especially during the tenure through green certification and transparent information disclosure, can effectively alleviate information asymmetry and thus improve financing efficiency. Signaling theory further explains the deeper significance of enterprises issuing green bonds and their subsequent fund management behaviors. Issuing green bonds sends a positive signal to the market that the enterprise is committed to sustainable development, while management actions such as establishing special accounts and disclosing environmental benefits serve to continuously reinforce this signal, helping attract investors who prefer green assets. Additionally, the maturity matching theory points out that the alignment of investment and financing terms is key to improving efficiency. Green bonds are mostly medium- to long-term debt, and if fund management can achieve dynamic matching with the entire life cycle of green buildings, it will effectively mitigate the

maturity mismatch risk caused by 'short-term borrowing for long-term investment,' optimize the debt structure, and reduce liquidity risk.

3 Domestic and International Research Progress

3.1 Real Estate and Green Finance Linkage

Combining environment and finance allows the market to conduct "financial activities" and "environmental protection activities" simultaneously [3]. Issuing green bonds increases the social attention paid to the issuer and guides enterprises to reduce carbon emissions [4]. The World Bank estimates that green buildings, with their new highlights of energy saving, environmental protection, and applicability in commercial real estate, will become investment targets with significant development potential. Furthermore, green bonds, insurance, and credit have created a complete industrial chain loop for green real estate [1,5].

According to previous studies, the advantages of green bonds can reduce the reliance of real estate enterprises on fiscal subsidies. First is the interest rate advantage: the green label sends a positive signal to the stock market, bringing a green premium in the stock market for the bond issuer [6]. Green bonds help reduce carbon dioxide emissions, and this carbon benefit can significantly reduce their yield spread, potentially lowering the credit spread of green bonds by 21% [7,8]. Second is the maturity advantage: according to the maturity matching theory, matching the investment recovery period with the financing period is the most suitable investment and financing combination [9]. However, using traditional credit models to support green buildings faces the risk of maturity mismatch [10]. Green bonds are mostly medium- and long-term debts that match green projects, so issuing green bonds can suppress the maturity mismatch of investment and financing in real estate enterprises [11,12]. Third is the information transmission manifestation advantage. Green bonds can also exert positive policy effects, optimizing corporate reputation, governance, and debt structure, and alleviating information asymmetry between enterprises and investors [13,14]. Moreover, investors with a preference for green investment are willing to pay for the green premium, which highlights the consumer side's recognition of the characteristics represented by green commodities and the improvement of environmental quality [15,16].

Starting from actual cases, testing the green buildings of real estate enterprises found that the building energy saving rate reaches 65% and above, and the higher the proportion of environmentally friendly buildings, the lower the cost of corporate bonds issued by the enterprise [17,18]. More importantly, the issuance of green bonds by enterprises generates a spillover effect, which will drive the same industry to take more actions beneficial to environmental protection [19]. Therefore, it can be said that real estate enterprises can assume environmental protection responsibilities.

3.2 Current Status of Green Bond Fund Management

Enterprises issuing green bonds should manage the compliance of green projects, the

use of funds, and repayment risks [20]. The issuance of green bonds by real estate enterprises helps inhibit the financialization of the real estate market [21]. Since real estate regulation policies do not make an institutional distinction between green buildings and general real estate development, financial institutions are afraid or unwilling to support green building development [22]. Therefore, it is necessary to resolve the difficulties of policy support, the green credit system, and the improvement of information disclosure to ensure funds remain green [23]. Currently, the constraining effect of green bond policies on the financing of real estate enterprises issuing bonds later will inhibit the level of environmental protection investment [24]. Therefore, this paper believes that bond issuers can start from the internal aspect first.

First is conducting green certification. Bond assessment and certification bodies can promote the consistency and comparability of green bond-related information. Third-party certification allows investors to clearly understand the "greenness" of green bonds; therefore, green certification during the bond's tenor helps transmit a continuous and standardized "green" signal from the issuer to the market, reducing investors' concerns about adverse selection regarding the bond issuer. The higher the issuer's credit rating, the higher the proportion of issuance amount [25–28]. Second is bond information disclosure. High-quality information disclosure can reduce agency costs and protect the interests of creditors [29], increase credit support for enterprises and reduce debt financing costs [30], as well as lower the issuance cost of the next green bond [31]. Comparing green bonds that disclose environmental information with those that do not, it is found that there is a green disclosure premium in the green bond market [32]. However, there are problems such as a lack of continuous tracking of the use of corporate green bond funds, and the use has not yet achieved penetrative management [33,34]. Therefore, a management system can be constructed that builds an information disclosure framework centered on the use of raised funds [35], establishes special accounts or dedicated institutions for management [10,36], and introduces temporary disclosure rules into the disclosure regulations during the tenor [37].

3.3 Current Status of Green Bond Financing Efficiency Research

Studies have found that real estate enterprises can optimize financing efficiency by increasing the actual proportion of bond financing [38]. There is a "U-shaped" relationship between environmental regulation and financing efficiency, which has a substitution effect with green bonds, so issuing green bonds can improve debt financing efficiency. Improving corporate debt structure through green bond financing can bring its role in corporate financial strategy into play [39–41]. Typically, green bonds have lower interest rates, and bond financing efficiency is reflected in the spread between the issuance rate of green bonds and ordinary bonds [42]. However, the scale of funds raised by green bonds is large; untimely and inefficient use and lack of planning lead to low green bond financing efficiency. Although the financing efficiency of most listed companies is relatively high and stable, the allocation efficiency after green bond financing remains relatively low [43–45].

Enterprise financing efficiency is divided into efficiency in the fundraising process and in the fund use process. Empirical findings show that the financing efficiency of

short-term debt funds is lower than that of long-term debt funds [46]. From the perspective of investment and financing maturity mismatch, using more funds for green projects helps improve green bond financing efficiency, but commercial banks should conduct a comprehensive evaluation of green bond projects to grasp their sustainability and risk [47,48]. At the same time, the investment return recovery cycle of the project should be considered, as the longer the investment return recovery cycle, the lower the financing efficiency [49].

4 Research Review and Future Outlook

Based on the review of the above papers, it can be seen that green finance has shown a positive impact in promoting the development of green buildings and reducing enterprises' dependence on fiscal subsidies, making the issuance of green bonds by real estate companies an environmentally friendly strategic choice. However, the effect of green bond policies on real estate companies is not significant, so enterprises need to rely on their own management capabilities to ensure the security of this financing tool, the proper use of funds, and the market attractiveness of green products, thereby improving financing efficiency. Efficient financing for real estate companies not only means the speed of obtaining funds but also concerns their control over potential risks; if these risks can be prevented and eliminated, it will undoubtedly further enhance the efficiency of bond financing.

Although existing research has explored the advantages of green bonds, studies on how to translate these theoretical advantages into specific operational strategies are still insufficient. In terms of green bond fund management, the literature has proposed many methods and deficiencies, but discussions on detailed implementation paths are not systematic enough. In addition, fund management indeed affects financing efficiency, but there is currently a lack of strategies to improve financing efficiency specifically tailored to the characteristics of the real estate industry. Overall, research on the impact of green bond fund management on financing efficiency is relatively limited, and existing studies mostly focus on empirical analysis. One could choose a single case company to explore effective ways to improve the financing efficiency of green bonds, with the aim of providing stronger theoretical support and practical guidance for the green transformation of the real estate industry.

5 Conclusion

Against the backdrop of the “Dual Carbon” goals and the “Three Red Lines” policy, although green bonds possess theoretical advantages such as reducing financing costs and mitigating maturity mismatches, the actual financing efficiency of real estate enterprises remains constrained by practical defects in fund management, notably opaque information disclosure and insufficient tracking. Moving forward, real estate enterprises must integrate fund management throughout the entire lifecycle of fundraising, continuation, and refinancing. By constructing an adaptive framework through dedi-

cated account management, third-party certification, and penetrative disclosure, enterprises can effectively mitigate risks and unlock the green premium. This approach will translate theoretical advantages into tangible improvements in financing efficiency, ultimately facilitating the green transformation of the industry.

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