

# Research on the Impact of Green Credit on Enterprises' Green Innovation

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**Abstract.** In recent years, environmental problems have been highlighted as serious as well as urgent, and green finance has gradually become a hot topic. As green credit has evolved, the academic research and discussion on it is also very enthusiastic. Based on the analysis of government regulation, listed companies, and other aspects, the effect of green credit adoption on businesses' green innovation and empirical research is a popular research topic among scholars in this field. Studies have indicated that, among other things, green credit has a catalytic influence on corporate innovation. This paper synthesizes green credit's effect on business green innovation discussed in several papers. The results show that, firstly, the impact of green credit is divided into the direct way that affects the cost of financing and the indirect way that plays the role of intermediary, etc. Secondly, the impact is broken down into the volume, caliber, and continuity of businesses' use of green innovation; also, there are differences in the impacts of green credit on state-owned enterprises and non-state-owned enterprises, and in different locations, etc. The influence of green finance on green innovation in businesses are also different from each other. And the heterogeneity difference is most significant relative to heavily polluting enterprises and green enterprises. Overall, green credit exerts a more robust resistance and motivating impact on profoundly polluting initiatives and corporations.

**Keywords:** Green credit policy; business innovation; green innovation; financing costs.

## 1. Introduction

In the process of rapid development of society, the perpetual growth of the economic magnitude and the continuous extension of the enterprise field triggered a series of complex issues that gradually emerged and clearly defined. Among other things, environmental problems have been highlighted as serious and urgent and have become a common global concern. To solve the increasingly serious environmental problems, China's exploration of the green development path is in full swing. The development of green finance has gradually become a hot topic. Specifically, green innovation in enterprises has become a goal pursued by more and more enterprises in economic construction. As a multidimensional and wide-ranging issue, green finance covers a wide range of complex contents, highlighting its important position in the modern financial system. Specifically, in the core areas of banking operations, green credit facilities have taken on a crucial strategic importance. In recent years, given the significant increase in the construction of green infrastructure worldwide and the trend of the concept of sustainable development becoming more and more popular, the green lending business has shown a strong development trend in which the total volume has continued to climb and the scale of the business has expanded rapidly. This phenomenon not only reflects the positive response of financial institutions to the commitment to environmental protection and social responsibility, but also signals that the financial sector will be more closely integrated into the trend of green economic transformation in the future and will promote the economic system in the direction of a more low-carbon, environmentally friendly and sustainable.

With the advent of green credit, the academic research and discussion related to it are also very enthusiastic. Based on the analysis of government regulation [1], listed companies [2], labor market [3], and green total factors [4] and so on, the effect of green credit implementation on businesses' green innovation and empirical study, as well as the study of green credit on the development and transformation of the financial economy and so on are the subject of scholars' research in this field. The research revealed that the adoption of green credit has a substantial impact on augmenting overall

factor productivity, as well as reducing the rate of carbon emissions, as well as promoting corporate innovation, among other things. Taken together, the implementation of green credit as a policy has a significant impact on the green innovation of enterprises. As for the specific ways of influence and the degree of influence, there is an urgent need for further generalization and in-depth research.

This paper will summarize the influence of environmentally friendly financing on corporate creativity, as inferred from prior investigations. Firstly, this paper will review the impact mode and examine the diversity of the influence magnitude of each category of business and locality. Then, based on the literature of further research by scholars in recent years, this paper will refine the classification of the impact. Finally, this paper will give an overview of the problems of green credit and the corresponding recommendations and put forward the research outlook.

## **2. Importance of green credit**

Green credit has been occupying an exceptionally important position as a financing strategy proposed for the green development of the country. First, from the perspective of financial support, green credit, as a credit policy that provides green enterprises with start-up and transformation funds, is crucial to the development of enterprises. In addition, for economic development to be compatible with environmental protection, sufficient funds must be invested in environmental management. Economic means to control the flow of funds, the concept of "green credit" to influence the flow of production funds [5]. Secondly, in terms of scale and scope of expansion and development, green credit occupies an equally integral part of the financial landscape. In recent years, the scope of green credit has been increasing and the overall volume has experienced rapid growth. At the end of last year, China's local and foreign currency green loan balance exceeded 30 trillion yuan after. Recently, the People's Bank of China (PBOC) disclosed the latest data, showing that in the first quarter of this year, China's green loans continued to grow at a high rate. As of the end of the first quarter, China's domestic and international green loan portfolio stands at 33.77 trillion yuan, marking a 35.1% year-on-year increase, surpassing the loan growth rate by 25.9 percentage points. In the first quarter alone, there was a staggering 3.7 trillion yuan increase in this portfolio, setting a new record for quarterly incremental growth [6]. Green credit, with its rapid expansion, is a sign of the value position it currently occupies and its promising future. In addition to this, green credit has a significant impact on the development and transformation of the economy. In the process of promoting China's high-quality development, green credit promotes enterprises' green technological innovation and enhances their environmental performance [7]. Green credit helps companies to innovate technologically and is significant for high-quality development.

## **3. Ways or Means of Impact**

### **3.1. Direct Impacts - financing Aspects**

The most direct way in which green credit affects corporate environmental innovation is by controlling the flow of funds. Green credit is biased in the direction of financing green projects and can incentivize green innovation in enterprises. The promotion of green credit for corporate green innovation is twofold. On the one hand, there is the disincentive effect of green credit on the financing of more polluting firms. For enterprises and projects that are more polluting and do not focus on research and development, the threshold and cost of financing become higher, thus restricting the financing behavior of such enterprises. In turn, the reduction in loans can make other investors less willing to invest in the business, thus deepening the negative impact [3]. In this way, enterprises are forced to carry out green innovation and realize green development transformation. Therefore, for enterprises focusing on research and development, the transformation willingness of heavy pollutantized enterprises is stronger, and they are increasingly inclined to reallocate resources in order to pursue green technological innovation, thereby perpetually hastening the pace of their green transition and enhancement [8].

It has been found that the financing constraint effect generated by green credit is more significant for heavy polluters, so the green transformation and upgrading of heavy polluters is greater compared to other enterprises [9]. However, recent studies have shown that green credit inhibits green innovation in firms when the financing constraints of green credit are greater than the transformation incentives for heavily polluting firms [10].

### **3.2. Intermediation and Indirect Effects**

Green credit not only directly affects the financing support of enterprises, but also strengthens the influence of third parties on the green innovation of enterprises, thus strengthening the influence on the green innovation of enterprises and playing an intermediary role. For example, Chen Na and Chen Jiang have conducted a study on digital financial inclusion and corporate green innovation [11]. The study shows that the adoption of a green credit policy enhances the risk management and evaluation capabilities of financial institutions for environmentally friendly projects, diminishes the financing expenses and risks associated with digital inclusive finance in the realm of sustainability, and consequently amplifies the influence of digital inclusive finance on corporate green innovation. Jiayue Liu and Zhewei Yu studied the relationship between green credit, executives' willingness to innovate, and firms' innovation persistence and found that green credit promotes firms' innovation persistence by promoting executives' willingness to innovate. Song Hongyu and Hou Guisheng found the shock effect of green credit on labor demand, that is, green credit affects the employment of enterprises through the output effect and financing constraint effect. Employment directly affects the labor force owned by an enterprise and is an indispensable and important factor in the development of green innovation. Reduced demand for labor hinders the advancement of environmentally friendly innovation within corporations [12]. Furthermore, green credit also fosters environmentally conscious innovation within corporations by augmenting environmental transparency [2]. By influencing a factor, green credit enhances the impact of this factor on the green innovation of a company, thus achieving a deeper impact.

## **4. Impact Aspects**

As opposed to earlier studies on promotion or inhibition, researchers studying the effects of green credit have been delving further into the subject in recent years, and as a result, the public has come to perceive more focused research themes and directions. The effect of green credit on enterprise green innovation has been refined into three aspects.

### **4.1. Number of Green Innovations**

In the development of green innovation, the number of green innovations is a very important criterion. The increase or decrease in quantity most directly reflects the enterprises' green innovation behavior. For different kinds of firms, there is also some heterogeneity in the effects of green credit on the amount of green innovation in firms. For heavy-polluting enterprises, Fan Yueyue's study suggested that green credit has different influences on different types of heavy-polluting enterprises, i.e., green credit promotes the rise of the number of green innovations. At the same time, the number of innovations of their green enterprises got more significant growth [1]. Although the demarcation criteria are different, Wang Bo et al. also concluded from their study that green credit contributes significantly more to the number of innovations in green firms than in heavily polluting firms [13].

### **4.2. Quality of Green Innovation**

High-quality development is the theme put forward in the report of the 20th Party Congress and has been practiced on the road of China's builders. Green credit will force enterprises to develop the quality of green innovation through "pressure" [14]. Green credit has significant heterogeneity in different aspects of enterprise green innovation.

In terms of the nature of business ownership, green credit significantly improves the quality of green innovation in state-owned enterprises. Because state-owned enterprises will have a stronger willingness to respond to the national call for green development, pursue economic growth and innovation, and be able to enjoy more favorable policies. So compared with non-state-owned enterprises, the index of green innovation quality of state-owned enterprises is higher. In terms of the life cycle of firms, there is a significant increase in the quality of green innovations of firms in the growth phase, which is related to market regulation. In the growth period, market regulation plays a positive role and can further promote the growth of green innovation quality of companies. In the maturity period, firms become larger and more stable. Green innovation requires large financial support and long-term R&D investments, and market regulation plays a negative role in this. As a result, green credit contributes more significantly to the quality of green innovation in firms in the growth period. However, it is worth noting that when a mature enterprise has a strong willingness to research development and innovation, then the formation of a monopoly status and bringing a large amount of money, will still significantly promote the quality of green innovation. In terms of the restrictiveness of green credit, for unrestricted enterprises, green credit resources will have a significant bias, then the development of the quality of green innovation of such enterprises is much greater than the development of restricted enterprises, the development of more and significant [15].

### 4.3. Sustainability of Green Innovation

The continuity of green innovation in business is an important part of business sustainment. Green credit influences firms' green innovation sustainability through investment climate, labor demand, executives' willingness to innovate, and so on. Wang Bo showed through his study that for firms with restricted green credit, the policy significantly inhibits firms' green innovation persistence by elevating debt financing costs and reducing R&D investment [13]. It has a significant negative impact on the green sustained innovation of non-state-owned enterprises, non-high-technology enterprises, enterprises in the central, western, and northeastern regions, enterprises with a general business environment, and enterprises with a high degree of financing constraints. At the same time, the inhibitory effect is more pronounced in enterprises with a lower level of green financial development and weaker environmental regulations. In addition to this, it has been discovered that more financially advantageous companies, as well as regions with a more ample labor pool, also enhance the impact of environmentally friendly financing on the sustainability of firms' innovation [12].

## 5. Conclusion

This paper provides an overview of the influence of green credit on corporate green innovation. This essay provides an overview of the impact of green credit on corporate green innovation. To summarize, the impact of green credit is divided into the direct way that affects the cost of financing and the indirect way that plays the role of intermediary, etc., and the impact is divided into the magnitude, quality, and continuity of green innovation of enterprises. Heterogeneity varies considerably relative to HMEs and green firms, and there are disparities in the impact of green credit for SOEs and non-SOEs and different regions, among other things.

At the same time, the conclusion of the study found that, under the principle of compliance, safety, and profitability of credit business operations, green credit business has some dilemmas, such as "threshold access", "service tenacity", and "product increment". Several recommendations can be summarized in response to the problems identified and to enhance the promotional effect of green credit. Firstly, improve and perfect the green credit system, enrich the diversity of green credit products, and enhance the rational allocation of credit resources. Secondly, enhance the quality of the green credit mechanism constraints and incentives, and strengthen the government's policy support. In addition to the establishment of the "government-bank-enterprise" trinity green credit policy effect evaluation system and promotes the theoretical research and exploration of green credit policy. In

addition, the establishment of a "government-bank-enterprise" trinity of green credit policy effect evaluation system, to promote the theoretical research and practical exploration of green credit policy.

## References

- [1] Fan Yueyue. Research on the impact of green credit policy on enterprises' green technology innovation. Qilu University of Technology, 2024.
- [2] Wang Lei. Research on the impact of green credit on enterprises' green technology innovation. Qilu University of Technology, 2024.
- [3] Song Hongyu, Hou Guisheng. A study of the shock effect of china's green credit policy on labor demand-evidence from a quasi-natural experiment in china. *Southern Economy*, 2024, (06): 77-97.
- [4] Wu Minghui. Research on the impact of green credit on green total factor energy efficiency. *Chinese Market*, 2024, (17): 32-36.
- [5] Xu Xiaohui. The importance of green credit from the inverted u-curve. *Modern Business*, 2019, (01): 91-92.
- [6] Zhang Bingjie. Green credit grows at a high speed and multi-level service system is gradually formed. *Financial Times*, 2024, (5).
- [7] Peng Cheng. Research on the problems of green credit supporting enterprises' green technology innovation. *Modern Business*, 2022, (26): 128-130.
- [8] Qin Teng, Ma Jianfeng, Tong Jinping, et al. green credit, marketization and green transformation and upgrading of heavily polluting enterprises-with moderated mediation effects. *Soft Sciences*, 2024, 1-14.
- [9] Li Liangbing, Jia Jing. Research on the impact of green credit policy on enterprises' investment in innovative activities - an empirical analysis based on panel data of a-share listed enterprises from 2007 to 2020. *Journal of Xi'an University of Architecture and Technology (Social Science Edition)*, 2023, 42 (04): 67-77
- [10] Jian Guanqun, Zheng Xiya. "Punish" or "Incentivize"? --A study on the green innovation effect of green credit policy. *Financial economy*, 2024, (05): 54-65.
- [11] Chen Na, Chen Jiang. Digital inclusive finance and corporate green innovation - based on the mediating role of green credit policy. *Technology Venture Monthly*, 2024, 37(06): 133-138.
- [12] Liu Jiayue, Yu Zhewei. Green credit, executive innovation willingness and corporate innovation persistence. *Jiangnan Academic*, 2024, 43(03): 109-117.
- [13] Wang Bo. Empirical study on the impact of green credit policy on enterprises' green continuous innovation. *Shandong University of Finance and Economics*, 2024.
- [14] Liu Lanbiao, Ren Kexin. Research on the impact of green credit policy on the quality of corporate green innovation. *Nankai Journal (Philosophy and Social Science Edition)*, 2023, (06): 131-145.
- [15] Liu Z, Wei T. Green credit, market competition and corporate green innovation quality. *Friends of Accounting*, 2024, (13): 70-78.