

Literature Review on Green Finance and Corporate Green Innovation

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Abstract. Under the background of "dual-carbon" strategy, how green finance can help enterprises' green innovation and promote social transformation has become a key issue. This paper compiles the literature on green finance and enterprise green innovation at home and abroad in the form of literature review, summarizes the definition, development history and indicator measurement methods of green finance and enterprise green innovation, outlines the economic consequences of green finance and the influencing factors of enterprise green innovation, and based on the theoretical foundations adopted by scholars at home and abroad, and sums up the impacts and mechanisms of green finance on enterprise green innovation. It is found that most scholars believe that green finance can actively promote enterprise green innovation. In terms of the mechanism of action, this paper concludes that green finance can promote corporate green innovation by alleviating financing constraints, increasing the proportion of long-term debt and alleviating the shortage of funds, etc. Differences in enterprise size, pollution level, ownership and external regional intellectual property rights will lead to different degrees of influence of green finance on corporate green innovation. In response to the above findings, this paper proposes future research directions for green finance and corporate green innovation, with a view to providing help and insights for the effective promotion of corporate green innovation and the development and improvement of the theoretical framework of green innovation.

Keywords: Green Finance; Outcome Mechanism; Corporate Green Innovation; Influencing Factors; Literature Review.

1. Introduction

Since the Industrial Revolution in the 18th century, the rapid development of industrial civilization has brought mankind great material wealth, but the global average temperature has increased significantly and is constantly approaching the Earth's systemic tipping point, which has not only given rise to a series of ecological and environmental problems, but also had a significant impact on the economic system[1]. In September 2020, General Secretary Xi Jinping announced at the United Nations General Assembly that China will strive to achieve the policy of carbon peaking and carbon neutrality; at the same time, as the world's second largest economy, in order to fulfil its role as a great power, in October 2023, the Central Financial Work Conference proposed for the first time to "accelerate the construction of a financial power", stressing that green development and the achievement of the "dual-carbon" goal cannot be achieved without the solid support of green finance.

In the context of the "dual-carbon" strategy, how green finance can help enterprises in green innovation and promote social transformation has become a key issue[2]. Green finance not only provides financial support and risk diversification for enterprise technological innovation, but also plays the role of monitoring and preventing pollution, forcing enterprises to green innovation, and is an important institutional means to promote green transformation of the development mode[3]. Therefore, it is of great theoretical and practical significance to study the effect of green finance in promoting green innovation of enterprises. The purpose of this paper is to categorize and summarize the existing literature on green finance to promote enterprise green innovation, to summarize the economic consequences of green finance and the influencing factors of enterprise innovation, to clarify the influencing relationship between the two, and to put forward constructive suggestions for the future theoretical research perspective.



2. Concept and Development of Green Finance

2.1. Definition of Green Finance

Green finance is an emerging concept, also known as sustainable finance, low carbon finance, environmental finance, eco-finance, etc. It is a financial concept based on the urgent need of environmental protection and green development[4]. Although green finance is the focus of attention from all walks of life, a widely adopted and unified definition has not yet been formed internationally due to the uneven industrialization process in different countries.

Overseas scholars were the first to define green finance. For example, Salazar (1998) pointed out that "green finance is a financial innovation that seeks to protect the environment, and it is a bridge between the financial industry and the environmental industry"; Labatt and White (2002) believed that "green finance is a financial instrument that is based on the study of the market, improves the quality of the environment and transfers environmental risks"; Jeucken (2001), based on the needs of financial institutions for sustainable development, points out that "the development of green finance is an objective need for the sustainable development of the financial industry"[5].

Domestic scholars have also defined green finance from a variety of dimensions such as financial needs, economic instruments and environmental requirements. For example, Wang Jing and Wang Guangming (2010)[11] believe that green finance is born with the sustainable development path and low-carbon economic model, and it is the sum of financial instruments, green financial elements and financial innovation .

2.2. History of Green Finance

In 1989, British economist David Pearce proposed the concept of "green economy", marking the official birth of green finance.[6]

Since the early 1990s, the development of green finance has entered a phase of continuous expansion, with various energy-saving and emission-reduction organizations emerging first, and industry standards related to green finance being established and improved. 1992, with the signing of the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD), environmental protection and emission reduction became the focus of global attention, and the concept of green finance was promoted[7]. At the G20 Summit in the same year, China included green finance as one of the key topics for international discussion and explicitly proposed expanding green investment and financing globally. In September 2023, the release of 20 outcomes, including the "Study on International Practices of Green Finance in the Belt and Road", further signalled the continued innovation in key areas of green financial.

3. The Concept of Green Innovation in Business

The definition of enterprise innovation is relatively well developed at present. Wei Jiang and Han Wu (1998) pointed out that "enterprise innovation in the broad sense refers to the sum of different elements of innovation ability within the same subject, such as management innovation, system innovation, technological innovation, organisational innovation, etc.; in the narrow sense, it refers exclusively to enterprise technological innovation"[19]. Guo Yue (2018) believes that "enterprise innovation is the transformation of technological advantages into product advantages, innovative achievements into commodities and returns through the market"[20].

Enterprise green innovation is a concept that pays more attention to environmental friendliness and sustainable development on the basis of enterprise innovation, which was firstly an important research issue in environmental economics, mainly focusing on the impact of various types of environmental regulations on the behaviour of enterprises from the micro level. Unlike ordinary innovation behaviour, green innovation can not only reduce environmental pollution and improve enterprise environmental performance, but also effectively improve enterprise competitiveness, thus achieving

a "win-win" situation in terms of economic benefits and environmental protection, and green innovation is an important way to achieve the coordinated development of economic growth and environmental protection.

Nonetheless, there has been no universally accepted definition of corporate green innovation, as scholars have recognized and studied it from different perspectives. In terms of narrow content, enterprise green innovation is green technological innovation, which can be divided into product innovation and process innovation according to the process of industrial production, use and recycling[8]. Some foreign scholars have studied it from a broad perspective, considering that enterprise green innovation is the innovation output related to green products; some scholars have studied it from a goal-oriented perspective, and have found that enterprise green innovation is a kind of enterprise innovation that achieves sustainable development of the enterprise itself by gaining green competitive advantages[9].

4. Measurement of green finance, corporate green innovation

4.1. Measurement of Green Finance

According to the Guiding Opinions on Building a Green Financial System issued by the People's Bank of China, Ministry 7, green finance should cover green credit, green investment and green insurance, among which green credit is the most important component; with the diversification of other green financial products in recent years, scholars have constructed a green financial development measurement system by means of Principal Component Analysis (PCA), which objectively assigns weights to each indicator, and the green financial development index (GF) is then obtained. Except for green credit as the main proxy variable, different scholars choose other proxy variables differently. Green credit is usually measured by the ratio of interest expenses of enterprises in the six major energy-consuming industries, and a lower ratio of such expenses means a higher level of green credit. There are also scholars who measure by other indicators, for example, Shi Daimin(2022) adopts the green credit scale ratio to indicate the level of green credit[25]. Green investment is measured from two perspectives: energy-saving investment and green governance investment (Yu Bo et al., 2022)[24], which are broken down into the ratio of energy-saving financial expenditures, the ratio of pollution investment amount and environmental protection enterprises' equity investment amount.

4.2. Measurement of Green Innovation in Firms

Existing studies have measured corporate green innovation from three perspectives: green R&D inputs, green performance, and green R&D outputs.

Scholars who use green R&D input for measurement mainly start from the definition and purpose of enterprise green innovation, and believe that enterprise green innovation is an enterprise innovation that attenuates the negative externality of the enterprise development process on the ecological environment. At the same time, since pollution reduction and emission reduction of the resource-based enterprises is their main task, the ratio of R&D input to three-waste emissions is used as a measure of green technological innovation. However, the difficulty of further disaggregating the R&D input data limits the application of R&D input in enterprise green innovation.

There are relatively few studies that use green performance as a measurement indicator, and they are mainly divided by the production and sales process of enterprises, and comprehensively evaluated in terms of green research and development performance, green manufacturing performance, and green marketing performance, but it is difficult to use this type of measurement as a general method to quickly and effectively calculate and analyse the data in a specific region and time period.

Green R&D output, i.e. green patent data, can provide rich information with strong divisibility. Wang Xin and Wang Ying (2021)[31] measure the "quality" of green innovation with the number of green invention patent applications based on the classification of green innovation activities of enterprises,

while the "number" of green utility model patent applications is used as a comparative indicator to measure the quantity of green innovation. Li Rong et al. (2021)[10], on the other hand, argue that the number of green invention patents is the most innovative, using the ratio of green inventions filed by listed companies to all their invention patents filed in the year for measurement.

5. Theoretical Foundations

5.1. Theories of Corporate Social Responsibility

The theory of CSR aims to make enterprises get rid of the traditional thinking of "profit first" and pay more attention to the social responsibility they should undertake in the process of production, management and operation, thus creating intangible credibility value, which is the key to the long-term success and sustainable development of enterprises under the current socioeconomic conditions.

5.2. Theories of Sustainable Development

The theory of sustainable development refers to the allocation of resources to natural resources and environmental capacity, the requirement of contemporary static and future dynamic resource allocation at the same time to achieve the optimal, which in turn promotes the enterprise's green innovation, not only to ensure the survival and growth of enterprises in the present, but also to ensure the future sustainable development of the theory, which can be referred to as the connotation of "green finance".

5.3. Theory of Externalities

The theory of externalities, also known as external economy and spillover effect, is the theory of economic efficiency and the logical starting point of the theory of "green finance". Externalities can be divided into positive and negative parts, and the operating principle of green finance is to incentivize positive externalities by raising the cost of negative externalities, so that enterprises will eventually make environmentally friendly decisions.

5.4. Lighthouse Theory

Lighthouse theory emphasizes that public resources must be provided by the government rather than by private enterprises, so green finance is to provide financial support and improve resource utilization through green credit, green bonds, etc., which must be led by government finance to provide transformation to financial financing and market supply, and thus provide authoritative support for corporate green innovation.

5.5. Theories of Innovation

Innovation is an inevitable choice for the survival and development of enterprises. Schumpeter divided innovation into two categories, one is "sustaining innovation", that is, the improvement and optimization of existing products or services; the second is "disruptive innovation", that is, the complete reform and subversion of existing products or services. Enterprise green innovation usually belongs to disruptive innovation, through the introduction of new environmental protection technologies and concepts, changing the traditional industrial chain and business model, to achieve the minimization of negative impacts on the environment.

6. Economic Consequences of Green Finance

6.1. Environmental Dimension

Firstly, existing studies believe that green finance can curb carbon emissions through three paths: the optimization effect of resource allocation, the green innovation effect of enterprises and the signal transmission effect;

Secondly, green finance can reduce energy intensity[14], adjust the energy structure, and increase the rate of return on investment in green industries while lowering their financing costs, which in turn will enable talents and technologies to flow from the "two highs and one leftover" industries to the green industries;

Thirdly, the financing mechanism of green finance can generate financial support to promote green innovation in enterprises, energy efficiency and upstream and downstream industry efficiency[15];

Fourthly, green finance business usually conveys to the market the current government's investment trends and policy signals, which can effectively pry private capital into the green industry, the environment has a positive externality effect.

6.2. Economic Dimension

Green finance has three basic functions: market resource allocation, market pricing and risk management[16]. It can promote green innovation by reducing financing costs, broadening financing channels and enhancing total factor productivity, thereby achieving high-quality economic development.

Considering from the financing perspective, green finance eases the credit constraints of enterprises by reducing borrowing costs, improving the borrowing structure and broadening financing channels, making the borrowing structure of enterprises long-term, and thus increasing the financial support for green industries[17]; From the investment perspective, green finance has the cumulative effect of human capital[18], and its development attracts more investors while creating more investment opportunities, making them pay more attention to the performance of environmental responsibility and sustainable development, thus promoting the transformation of green scientific and technological achievements and improving green total factor productivity.

6.3. Corporate Governance Dimension

The impact on corporate governance is reflected in enhanced disclosure requirements and increased awareness of corporate executives' environmental responsibilities. High-quality information disclosure is an important reliance on corporate credit fund applications, and is an crucial guarantee for banks to measure corporate repayment ability and issue credit funds[19] .

The rapid development of green finance pushes companies to bring in more executives and professional organisations with an awareness of environmental responsibility, which in turn strengthens the professionalism of corporate governance in terms of environment and sustainability. Chen Shuhan et al. (2023)[38] argue that corporate managers with a background in finance or green policy are more inclined to increase their environmental investment, which in turn can effectively control corporate pollutant emissions.

6.4. By the Nature of Green Finance

With the development of green finance, financial institutions have innovated diversified products such as green credit, green bonds and green insurance while improving various management systems.

Firstly, the function of green credit can be realised through the dual role of green credit policy and green credit products, which can guide the capital allocation towards green development, making the supply of capital to be endowed with the characteristics of green development. Secondly, commercial banks tend to carry out projects with shorter liability cycles based on economic efficiency considerations, and thus green investment projects will be restricted; while green bonds usually have shorter maturities (the average maturity of labelled green bonds is 5-10 years), which can well solve the maturity mismatch problem existing in the process of green project financing. Thirdly, the service process of green insurance is mainly divided into three stages: ex ante assessment, ex post supervision and ex post protection. The first phase can guide enterprises to reduce high levels of pollution, the ex ante monitoring can reduce the environmental and social risks of enterprises, and the ex post

guarantee effectively prevents enterprises from transferring their own pollution costs to local finances in order to avoid financial compensation.

7. Influencing Factors of Enterprise Green Innovation

7.1. Policy Dimension

Policies are undoubtedly important drivers of green innovation for enterprises, such as tax incentives, environmental taxes and financial subsidies. Tax incentives can effectively reduce the burden of enterprises and achieve a win-win situation in terms of economic efficiency and sustainable development. For example, Huang Shoufeng and Zhao Yan (2023)[39] found that the accelerated depreciation policy of fixed assets as a tax incentive can effectively accelerate the enterprise equipment renewal.

In contrast, there are scholars who believe that environmental taxes can force firms to innovate in a green way. For example, Yu Lianchao et al. (2019)[23] found that environmental taxes significantly promote green innovation in large and state-owned enterprises, and enterprises with low financing constraints.

Modest financial subsidies are also an effective way to promote green innovation in enterprises. Zou Ganna et al. (2023)[40] (2023) found that the impact of financial subsidies on corporate green innovation shows an inverted U-shaped relationship of first promoting and then inhibiting, which provides strong support for this view.

7.2. Social Dimension

From the environment of business growth and development, social factors also have an important impact on corporate green innovation. For example, Li Dayuan et al. (2018)[41] argued that media monitoring can create public opinion pressure, which makes enterprises subject to certain ethical constraints and then propels them to carry out green innovation; from the public's point of view, Yi Zhihong et al. (2022)[42] found that the public is an important stakeholder of the enterprise, and its concern for the environment and its actions can drive the enterprise's green innovation behaviours.

Consumer environmental preference is also an important factor that positively influences corporate green innovation. With the increase of per capita GDP, education level and the acceleration of urbanization, consumers' concern for environmental protection issues gradually increases; therefore, the combination of consumer environmental preference and market competition[24] can effectively promote corporate green innovation.

7.3. Nature of the Enterprise

The nature of the enterprise is an important factor influencing the greening of the business, such as corporate culture, corporate social responsibility and green M&As.

In recent years, Confucian culture has aroused a trend of research, and how to go from 'unifying the family' to 'governing the enterprise' has become the research direction of many scholars. For example, Pan Zicheng et al. (2023)[26] illustrate the role of Confucian culture in promoting green innovation when it is integrated into enterprises from the connotations of 'altruistic' value norms and 'sense of worry' in Confucian culture.

CSR can also promote corporate green innovation. For example, Xiao Xiaohong et al. (2021)[47] found that the fulfillment of CSR by enterprises can significantly increase their social capital, which in turn enhances their level of green innovation.

Conducting green M&As is likewise instrumental in fuelling firms' green innovation. For example, Bi Qian and Tao Yao (2021)[48] suggest that green M&A by firms with high R&D intensity can positively promote green innovation.

7.4. Characterization

The internal factors affecting green innovation in enterprises mainly focus on the past experiences and personal characteristics of managers. Scholars have studied the past experiences of executives and concluded that managers are more likely to make green development decisions when they have academic and experience as returnees or higher titles, for example, Yin Jianhua and Shuang Qi (2023)[44] found that managers with higher title academic experience can enhance corporate green innovation willingness through environmental spirit moulding; Lu Jianci and Jiang Guangsheng (2022)[46] showed that managers who have received "green" education or engaged in "green" work have a more positive effect on corporate green innovation from the perspective of green experience.

Managers' personal characteristics can also influence their decision-making in favour of sustainable development. For example, Yin Zhihong et al. (2022)[42] found that when managers are female, older, or have certain hometown preferences their decision-making behaviours are more emotional and easily influenced by external factors to drive green innovation behaviours.

8. Research Between Green Finance and Corporate Green Innovation

8.1. Impact of Green Finance on Corporate Green Innovation

Most scholars in the early days usually defined green finance as green credit, and at the same time categorized corporate green innovation as technology-based innovation. For example, Wu Di (2013) studied the positive impact between green credit and green industry development, during which he also mentioned the mutually beneficial relationship between green industry development and enterprise product innovation; Li Kaifeng and Chen Qi (2020)[49] in their study on the impact of green credit on industrial green total factor productivity, found that improving the mechanism of green finance can strengthen the support for green technological innovation of green environmental protection enterprises.

With the continuous deepening and advancement of research, the definition of green finance is more diversified, scholars began to define it as green securities, green insurance, and more studies use "green finance" as a general term; enterprise green innovation is no exception, its scope goes far beyond technological innovation, but also can also include management innovation, institutional innovation, organisational innovation, etc. Under the background of carbon neutral strategy, Li Rong and Liu Luqian (2021) [10]found that green finance can help enterprises' green innovation and promote social transformation. Under the support of dual-carbon policy, Wang Fengrong et al. (2022)[50] focused on carbon emissions to study the relationship between green finance and the impact of high-quality green innovation of enterprises.

8.2. Mechanisms of Green Finance for Corporate Green Innovation

Many scholars not only study the direct impact of green finance on corporate green innovation, but also pay more attention to the mechanism of green finance on corporate green innovation, such as the mediating effect, heterogeneity analysis, moderating effect and so on.

The mediating effects of the role of green finance on corporate green innovation can be categorized into three types: alleviating financing constraints, enhancing the long-term debt ratio and alleviating capital shortages. For example, Wang Yulin and Zhou Yahong (2023)[51] , Zhuge Ruiyang and Cai Wenxia (2022)[52] found that green finance can provide enterprises with more diversified financing channels, thus alleviating financing constraints and thus promoting enterprise green innovation; Li Rong and Liu Luqian (2021)[10] found that green finance's innovative pilot zone policy can increase the proportion of long-term debt of enterprises, which makes the willingness of enterprises' green innovation and R&D stronger; Wang Ying and Feng Jiahao (2022)[53] study from the perspective of resource effect and find that green finance will introduce supervisory institutions and alleviate the problem of capital shortage, thus promoting green innovation R&D of enterprises.

Scholars' analyses of the heterogeneity of green finance for corporate green innovation can be mainly divided into heterogeneity at the firm level and heterogeneity at the external environment level. At the enterprise level, the role of green finance on corporate green innovation varies with the differences in the degree of pollution, size and ownership of enterprises (Li Rong, 2021; Wang Yulin and Zhou Yahong, 2023; Zhuge Ruiyang and Cai Wenxia, 2022). Other scholars have also studied the heterogeneity of the external environment, for example, Wang Yulin and Zhou Yahong (2023)[51] found that perfect regional intellectual property protection can give impetus to green finance to promote corporate green innovation.

Scholars have also done research on the regulation mechanism between green finance and corporate green innovation at the government, industry and corporate levels. In terms of government supervision, Zhai Wei (2022) found that increased environmental regulation by local governments positively moderates the role of green finance on corporate green innovation; in terms of the industry environment, Li Rong and Liu Luqian (2021)[10] concluded that the intensification of bank competition would enhance their innovation ability with green finance; from the internal perspective of the enterprise, Yang Yuming (2023) argued that corporate ESG scores can positively regulate the impact of green finance on corporate green innovation. Chen Guojin et al. (2021)[55] found that financing cost plays a negative moderating effect in the impact of green finance on green technological innovation of green enterprises, i.e., lowering the financing cost can improve the promotion effect of green financial policies on technological innovation of green enterprises.

9. Overview of the Current State of Research in China and Abroad

9.1. Summary

This paper firstly summarizes the definition, development history and quantification of green finance and corporate green innovation, and secondly outlines the economic consequences of green finance and the influencing factors of corporate green innovation based on the theoretical foundations adopted by scholars at home and abroad. This paper focuses on the current research situation between green finance and enterprise green innovation, and finds that most scholars believe that green finance can positively promote enterprise green innovation; in terms of the mechanism of action, this paper concludes that green finance can boost enterprise green innovation by alleviating financing constraints, increasing the proportion of long-term debt, and alleviating the shortage of funds. At the same time, differences in enterprise size, pollution level, ownership and external regional intellectual property rights will make the impact of green finance on corporate green innovation vary, while local regulatory efforts, increased bank competition, corporate ESG scores and financing costs will have a moderating effect on both.

9.2. Expectation

First of all, the durability and long-term sustainability of green financial policies are their core values. Existing research has mostly focused on the short-term impact of green finance on corporate green innovation, so how to formulate financial policies with long-term stability and continuity to ensure that funds can flow to the green sector in a sustained and stable manner is an important research direction for the future.

Secondly, China is the world's largest developing country, facing serious challenges of environmental protection and climate change. How to formulate green finance and enterprise green innovation measures that are in line with national conditions and operable in close connection with national development strategies and practical needs is another research direction.

In addition, the way of cooperation between enterprises and consumers, financial institutions and the government also has certain research value. Consumers' green consumption awareness and behaviour will directly affect the development of the green industry; financial institutions, as the main body of the green financial market, are able to innovate green financial products and services to meet the

green investment needs of enterprises; the government is able to provide strong support for the green innovation of enterprises through regulation and guidance. Therefore, how enterprises cooperate with these three parties to achieve a win-win situation between the economy and the environment is a future research direction.

References

- [1] Simon Thomas; Robert Repetto; Daniel Dias. Integrated Environmental and Financial Performance Metrics for Investment Analysis and Portfolio Corporate Governance: An International Review,2007.
- [2] LC Christianson; J Campion; DA Kamelhar; FA Bevelaqua. Construction of Green Financial System under the Carbon Peak and Carbon Neutrality Goals. [J]. Modern Economic Science, 2022, Vol.44(5):1-13.
- [3] BANSAL P, ROTH K. Why companies go green: a model of ecological responsiveness[J]. Academy of management journal, 2000,43(4):717-736.
- [4] Ren Xuedi, Shao Qinglong, Zhong Ruoyu. "Nexus Between Green Finance, Non-fossil Energy Use, and Carbon Intensity: Empirical Evidence from China Based on a Vector Error Correction Model", Journal of Cleaner Production, 2020 (277):122844~122845.
- [5] Ma L, Iqbal N, Bouri E, et al. How good is green finance for green innovation? Evidence from the Chinese high-carbon sector[J]. Resources Policy, 2023, 85: 104047.
- [6] Zhang Z, Wu Y, Wang H. Corporate financial fragility, R&D investment, and corporate green innovation: Evidence from China[J]. Finance Research Letters, 2024, 62: 105190.
- [7] Wang H, Du D, Tang X, et al. Green finance pilot reform and corporate green innovation[J]. Frontiers in Environmental Science, 2023.
- [8] Yang Y, Su X, Yao S. Can green finance promote green innovation? The moderating effect of environmental regulation[J]. Environmental Science and Pollution Research, 2022, 29(49): 74540-74553.
- [9] Rong L, Luxi L. Green Finance and Green Innovation of Enterprises[J]. China Economic Transition (CET), 2023, 6 (1).
- [10] Li Rong, Liu Luqian. Green finance and corporate green innovation[J]. Journal of Wuhan University (Philosophy and Social Science Edition),2021,74(06):126-140.
- [11] Wang Jing, Wang Guangming. Green Finance Innovation Model under the Path of Low Carbon Economy[J]. New Finance, 2010, (12):53-59.
- [12] Qiu Haiyang. Research on the economic growth effect of green finance[J]. Economic Research Reference,2017, (38):53-59.
- [13] An Tongxin, Hou Xiaomin, Yang Yang. Research on the theoretical connotation and realization path of green financial development in China[J]. Dongyue Discussion Series,2017,38(06):92-100.
- [14] Jin Hainian. Research on green finance evaluation system [M]. China Finance Press,2019.4.
- [15] David Pearce. Blueprint For A Green Economy[M]. Oxford: Earthscan, 1989 .
- [16] Ding Yingnan. Countermeasures for Mutually Beneficial Co-operation in Green Finance under the "Belt and Road" Initiative[J]. Finance,2023, (3):428-434.
- [17] He Dexu, Cheng Gui. Green finance[J]. Economic Research,2022, Vol.57(10):10-17.
- [18] Ma Jun. International Green Finance Development and Case Studies [M]. China Finance Press,2017.
- [19] Wei Jiang, Han Wu. Definition of technological innovation capability of enterprises and its association with core competence[J]. Research Management,1998, (6):12-17.
- [20] Guo Yue. Government subsidy signalling mechanism and corporate innovation[J]. China Industrial Economy, 2018, (9):98-116.
- [21] Wang Weiqiang, Sheng Minzhi. An empirical study of green technology innovation in Chinese enterprises[J]. Scientific Management Research,1995, Vol.13(3):48-53.
- [22] Ge Xiaomei, Wang Jingfang, Xue Bin. Research on Countermeasures to Promote Green Technology Innovation of Small and Medium-sized Enterprises[J]. Science and Science and Technology Management,2005, (12):87-91 .
- [23] Yu Lianchao, Zhang Weiguo, Bi Xi. Will Environmental Taxes Force Enterprises to Green Innovation? [J]. Audit and Economic Research,2019,34(2):79-90.
- [24] Yu Bo, Fan Conglai. Green finance, technological innovation and high-quality economic development[J]. Nanjing Social Science, 2022, (9):31-43.
- [25] Shi Daimin, Shi Xiaoyan. Green finance and high-quality economic development: Mechanisms, characteristics and empirical research[J]. Statistical Research,2022,39(1):31-48.
- [26] Weng Shuyang, Liu Hao. Green Finance, Green Innovation and High Quality Development[J]. Financial Research, 2022, (8):1-17.

- [27] Chen Yanhua, Guan Yuqiao. The impact of green finance on air pollution[J]. Finance and Economy,2023,(5):27-35,45.
- [28] Han Xianfeng, Xiao Jian. Carbon emission reduction effect of green financial development[J]. Resource Science,2023,45(4):843-856.
- [29] Ding Jie, Li Zhongfei and Huang Jinbo. Can green credit policy promote corporate green innovation? --Based on the perspective of policy effect differentiation[J]. Financial Research,2022.
- [30] Li Wenjing, Zheng Manni. Substantive or Strategic Innovation? -The Impact of Macro-Industrial Policy on Micro-Firm Innovation. Economic Research,2016, (4).
- [31] Wang Xin, Wang Ying. Research on green credit to enhance green innovation[J]. Management World, 2021, 37 (6):173-188,11.
- [32] Liu Wenyong. Theoretical foundation and practical development of green finance[J]. Heilongjiang Finance, 2018, (9): 15-17.
- [33] Fan Dan. Study on the Drivers of Carbon Emission Changes in China's Energy Consumption-Based on LMDI-PDA Decomposition Method[J]. China Environmental Science,2013,33(09):1705-1713.
- [34] Yiu Zhiting, Peng Zhihao, LI Peng. Research on the Impact of Green Financial Development on Regional Carbon Emission--Taking Green Credit, Green Industry Investment and Green Bond as Examples[J]. Financial Theory and Practice, 2022, (2):69-77.
- [35] Wen Yinyin, Zheng Wenzhi, Zheng Lilin. Research on the effect of green finance on carbon emissions[J]. Journal of Southwest Forestry University,2023,7(10):63-71.
- [36] Ji Xinlong, Li Wanting. Green Finance and the Improvement of Disclosure Quality of Heavily Polluting Enterprises--A Quasi-Natural Experiment Based on the Green Finance Reform and Innovation Pilot Zone[J]. Journal of Lanzhou University of Finance and Economics,2022,38(2):73-82.
- [37] Li Zhuwei, Liu Sennan, Li Jinjin et al. Can improving disclosure quality alleviate the financing constraints of listed firms-incorporating evidence from the classification of property rights nature[J]. Investment Research, 2019, 38 (08): 143-158.
- [38] Chen Shuhan, Yang Guangqing, Du Yafei. The "Green Mark" of Executive Financial Experience and Corporate Environmental Performance: Evidence from Listed Manufacturing Companies[J]. Journal of Fuzhou University (Philosophy and Social Science Edition),2023,37(2):38-51, 172.
- [39] Huang Shoufeng, Zhao Yan. Tax incentives and corporate green innovation[J]. Fiscal Research,2023, (2):68-81 .
- [40] Zou Ganna, Yuan Yijie, Xu Qifan. Environmental costs, financial subsidies and corporate green innovation[J]. China Soft Science,2023,(2):169-180 .
- [41] Li Dayuan, Song Jie, Chen Li, Zhang Lu. Can Public Pressure Promote Corporate Green Innovation? [J]. Research and Development Management,2018,30(6):23-33.
- [42] Yin Zhihong, Chen Xin, Tian Liu. The impact of public environmental concern on corporate green innovation[J]. Economic Theory and Economic Management,2022,42(7):32-48.
- [43] Zheng Zhiqiang, Ma Yongjian, Fan Aijun. Environmental preference, market competition and corporate green innovation[J]. Journal of Shandong University (Philosophy and Social Science Edition),2023, (4):125-136.
- [44] Yin Zhiqiang, Shuang Qi. The driving effect of CEO academic experience on corporate green innovation - A dual perspective of environmental attention allocation and industry-academia-research co-operation empowerment[J]. Science and Technology Progress and Countermeasures,2023,40(3):141-151.
- [45] Shen Fei, Tao Qizhi, Zhang Yun. Research on the Impact of Directors' Overseas Background on Corporate Green Technology Innovation - Based on the Perspective of Corporate Reputation[J]. Journal of Shanghai University of Finance and Economics,2022,24(3):108-122.
- [46] Lu Jianci, Jiang Guangsheng. Can CEO green experience promote corporate green innovation? [J]. Economic Management,2022,44(2):106-121.
- [47] Xiao Xiaohong, Pan Ye, Wang Zhanjie. Does corporate fulfilment of social responsibility promote corporate green innovation? [J]. Economic Jingwei,2021,38(3):114-123.
- [48] Bi Qian, Tao Yao. Green M&A and Corporate Green Innovation[J]. Finance and Accounting Monthly,2021, (16):38-45.
- [49] Li Kaifeng, Chen Qi. How green credit affects industrial green total factor productivity[J]. Wuhan Finance, 2020, (10):45-50,88.
- [50] Wang Fengrong, Li Anran, Gao Weiyan. Does Carbon Finance Promote the Level of Green Innovation? --A quasi-natural experiment based on carbon emissions trading policy[J]. Journal of Lanzhou University (Social Science Edition), 2022,50(6):59-71.
- [51] Wang Yulin, Zhou Yahong. Green financial development and corporate innovation[J]. Financial Research, 2023, 49 (1):49-62.

- [52] Zhuge Ruiyang, Cai Wenxia. Research on the Impact of Green Finance on Green Innovation of Industrial Enterprises - A Quasi-Natural Experiment Based on the Establishment of Green Finance Reform and Innovation Pilot Zone[J]. Financial Theory and Practice,2022, (11):49-61.
- [53] Wang Ying, Feng Jiahao. Research on Green Bonds to Promote Enterprises' Green Innovation [J]. Financial Research, 2022, (6):171-188.
- [54] Xu Ke, Zhang Yafeng. Can green science and technology innovation bring green water and green mountains? --A Study Based on Green Patent Perspective[J]. China Population-Resources and Environment,2021,31(5):141-151.
- [55] Chen Guojin, Ding Saijie, Zhao Xiangqin, et al. China's Green Finance Policy, Financing Costs and Green Transformation of Enterprises - Based on the Perspective of Central Bank's Collateral Policy[J]. Financial Research, 2021 (12):75-95.