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A Review of Green Credit Policy and Corporate Green Transformation

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Abstract: *As a core component of China's green financial system, green credit plays a pivotal role in facilitating corporate green transformation and the realization of the Dual Carbon goals. This paper presents a systematic review of research concerning the impact of green credit policy on corporate green transformation, constructing an analytical framework across four dimensions: policy effects, transmission mechanisms, influencing factors and firm heterogeneity. Findings indicate the influence of green credit policy on corporate behavior via resource allocation, cost constraints and signaling effects, subject to moderation by factors such as risk-taking levels, environmental regulation intensity, property rights and firm size. While existing literature has achieved significant results in policy evaluation, mechanism identification, and heterogeneity analysis, scope remains for expansion in long-term effect tracking, mechanism deepening and regional disparity research. Based on a summary of current studies, this paper proposes a future research focus on policy synergies, dynamic evolutionary patterns and micro-mechanisms, providing theoretical references for the refinement of the green financial policy system and the promotion of high-quality economic development.*

Keywords: *Green Credit Policy; Corporate Green Transformation; Resource Allocation; Environmental Regulation; Policy Effects*

1. Introduction

1.1 Research Background

The promotion of a green transformation in economic development modes is an intrinsic requirement for China's realization of high-quality development and the construction of a modern power. The proposal of the Dual Carbon goals indicates green development as the key thread in this new stage of high-quality development [1]. As a primary driving force for the Dual Carbon objectives, the development space for green finance has further expanded amidst the continuous release of policy dividends. Given the financial system's core function of improving resource allocation efficiency, there is a necessity for better service to the real economy and the guidance of capital towards key areas, such as energy conservation, consumption reduction and ecological protection via institutional and market mechanisms. While supporting economic growth, green finance assumes responsibility for the construction of an environmentally friendly society, encompassing the dual objectives of steady growth and environmental optimization. During China's transition from speed-oriented to quality-oriented development, despite massive resource input via administrative and taxation measures, environmental optimization effects remain below expectations [2]. The primary cause lies in the current governance's reliance on intensity reduction means (e.g., pollution discharge fees, desulfurization and denitrification) and a lack of direct constraints on total carbon emissions; such end-of-pipe governance often results in mere partial pressure relief rather than fundamental environmental improvement [3].

Currently, China has established a green financial system covering multi-level financial instruments, with green credit occupying a dominant position due to its broad coverage and large scale. According to official statistics, as of the end of the second quarter of 2025, China's green credit balance exceeded 42 trillion RMB, accounting for over 90% of total green finance capital. The *Green Credit Guidelines* (hereinafter the Guidelines), issued by the former CBRC in 2012, provided a key basis for the assessment of green finance development levels. As stipulated in the Guidelines, to advance environmental improvement, banks are to implement stricter credit management for industries with restricted green credit access, including the imposition of higher financing costs and elevated entry barriers, and to

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strengthen full-process supervision of corporate environmental governance performance, thereby accelerating the pace of corporate green transformation.

1.2 Research Significance

From a micro perspective, the enterprise constitutes the primary carrier for technological innovation and green transformation. As both the subject responsible for environmental governance and the main force of technological innovation, the enterprise faces dual pressures for the simultaneous elevation of environmental performance and innovation performance. Under the dual constraints of palliative governance modes and tightening financing restrictions, the realization of emission reduction targets relies critically upon green transformation via technological progress and process modification. Despite certain limitations in the micro-implementation of market-based instruments like green credit, the financial system's advantages in capital supply and resource allocation allow for the partial alleviation of corporate financing pressure, creating conditions for the R&D and application of emission reduction technologies [4]. While recent years have witnessed the introduction of multiple policies regarding green finance development and corporate transformation in China, scope for expansion exists regarding the synergy between the two and the specific mechanisms influencing corporate behavior. Existing research indicates that, within the tripartite game framework involving government, banks, and enterprises, green credit effectively suppresses pollution behavior while incentivizing clean production and innovation [5]. Furthermore, given the dual economic and social attributes of enterprises, the furtherance of the transformation process occurs via the reinforcement of corporate social responsibility constraints through green incentive policies. Consequently, a systematic review of research relating to green credit policy and corporate green transformation, summarizing existing findings and identifying research gaps, holds significant value for the deepening of theoretical understanding and the guidance of policy practice.

2. The Impact of Green Credit Policy on Corporate Green Transformation

2.1 Theoretical Basis of Green Credit Policy

The incorporation of environmental risk into financing decision-making endows green credit with economic effects, specifically resource allocation and efficiency enhancement, alongside its environmental governance function. Theoretically, explanation of the transmission mechanism of green credit policy is possible from multiple perspectives. First, regarding Resource Allocation Theory, financial institutions, as capital allocators, guide resource flow via differentiated credit policies. The requirement for credit constraints on high-pollution, high-energy-consumption enterprises and preferential support for eco-friendly firms facilitates the optimization of resource allocation efficiency [6]. Second, regarding Signaling Theory, green credit policy transmits a distinct government signal prioritizing environmental protection. The pursuit of financing support and market competitiveness drives corporate strategic adjustment, increased environmental investment, and the advancement of green transformation [7]. Third, under Externality Internalization Theory, the traditional market mechanism's relegation of pollution costs to society results in environmental externalities. Green credit policy prompts the partial internalization of these external costs by increasing financing costs for polluting enterprises, necessitating the consideration of environmental factors in decision-making [8]. Finally, according to the Porter Hypothesis, appropriate environmental regulation and policy pressure stimulate an innovation compensation effect, wherein corporate response to environmental constraints via technological innovation and management optimization achieves a win-win outcome for environmental improvement and competitiveness enhancement [9].

2.2 The Impact of Green Credit Policy on Corporate Innovation

At the macro level, academia generally affirms the positive impact of green credit on regional innovation, noting potential spillover effects. The environmental orientation of green finance policy contributes to industrial structure optimization and the promotion of regional economic growth and high-quality development. Green credit can, via the elevation of low-carbon technology requirements, trigger survival of the fittest technological change within the market, thereby elevating overall innovation levels. However, research also suggests a potential non-linear U-shaped relationship, positing that significant promotion of technological change and transformation upgrading occurs only after regional green credit development reaches a certain maturity [10]. This finding implies limited

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promotional effects during early policy stages due to institutional imperfection and low market acceptance, with effect enhancement occurring alongside policy system maturation and market mechanism refinement.

At the micro level, existing conclusions regarding the impact of green credit on enterprises exhibit certain divergence. One perspective emphasizes the punitive shock of credit constraints, such as debt financing scale contraction, rising costs, and shortened maturity, potentially crowding out R&D investment and reducing operational efficiency. Such studies suggest that for heavy-pollution enterprises, the increased difficulty in financing brought by green credit policy may lead to R&D investment reduction and a focus on short-term profitability projects, thereby suppressing innovation activities. Conversely, other studies argue against the necessary detriment to corporate innovation, suggesting instead a resource-guiding role via the optimization of long- and short-term debt structures and capital allocation efficiency improvement, providing external impetus for technological iteration. The promotion of corporate green innovation levels is achieved mainly through financing structure optimization, cost reduction, and investment direction guidance. Recent empirical evidence tends to support the latter perspective. Multiple empirical studies demonstrate that the implementation of the *Guidelines* has significantly stimulated overall innovation output in restricted industries. Notably, however, this promotional effect displays a distinct structural bias: the incentive effect on innovation quantity is pronounced, whereas the promotion of innovation quality remains limited. This indicates that while green credit policy successfully drives increases in patent application numbers, the enhancement of high-quality innovation outcomes, such as invention patents, requires further strengthening.

2.3 The Impact of Green Credit Policy on Corporate Environmental Behavior

The influence of green credit policy on corporate environmental behavior constitutes a focal point of academic inquiry. Based on the dual perspectives of emission reduction and development, Yu et al. conducted an examination of the policy's impact on the green transformation of high-pollution enterprises. Findings indicate a significant promotion of corporate pollution discharge reduction by green credit policy, an effect realized primarily through two channels: first, the compulsion of increased investment in end-of-pipe governance; second, the propulsion of green retrofitting of production processes. The former represents a passive response, while the latter signifies an active transformation. Further exploration of the screening effect of green credit business on corporate greenwashing behavior was undertaken by Lin et al. Greenwashing refers to the superficial declaration of environmental investment without actual improvement in environmental performance. Research indicates that following policy implementation, the strengthening of verification and supervision of corporate environmental information by financial institutions enables the effective identification and penalization of greenwashing enterprises, thereby compelling substantial green transformation. From the perspectives of capital integration and technological innovation, Liu et al. examined the policy's impact on corporate low-carbon transformation paths. Discovery of two mechanisms regarding the policy's influence was made: the facilitation of capital support acquisition via capital integration promotion; and the propulsion of low-carbon technology development and application via technological innovation incentives. Empirical results demonstrate the greater significance of the technological innovation channel, suggesting the policy functions not merely as a capital support tool, but crucially as a modifier of corporate incentive mechanisms, prompting active technological innovation and transformation upgrading.

2.4 The Impact of Green Credit Policy on Corporate Financial Behavior

Zhang et al. investigated the issue of loan interest rates for green enterprises from the perspective of commercial bank loan pricing behavior. Findings confirm the acquisition of lower loan interest rates by enterprises with superior environmental performance following policy implementation, verifying the policy's incentive effect. However, the concentration of such preferential rates within large-scale and state-owned enterprises, contrasted with limited benefits for small and medium-sized enterprises (SMEs) and private firms, reflects disparities in implementation effects across different enterprise types [11]. Zhang et al. examined the policy's impact on corporate default risk, exploring the predominance of transformation incentives versus risk-taking effects. Research reveals a reduction in default risk for enterprises capable of active policy response and green transformation; conversely, an increase in financial pressure and default risk is observed for enterprises exhibiting passive responses and slow transformation. This discovery indicates the "divergent characteristics" of green credit policy effects, contingent upon corporate response strategies and transformation capabilities.

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3. Mechanisms Underlying the Impact of Green Credit Policy on Corporate Behavior

3.1 Resource Allocation Effect

The most direct function of green credit policy implies an alteration in the direction of financial resource allocation. Through the implementation of differentiated credit policies across industries and enterprises, guidance of capital flow towards green environmental protection sectors and restriction of flow to high-pollution, high-energy-consumption industries are achieved. Manifestation of this resource allocation effect occurs at multiple levels. First, at the credit scale level, restricted enterprises face stricter credit quota controls and relative contraction in accessible loan scales, whereas green environmental enterprises may secure increased credit support. This differentiation directly influences corporate disposable funds and investment capabilities. Second, at the credit maturity level, potential shortening of loan terms for restricted enterprises leads to rising ratios of short-term debt, increasing liquidity risk and refinancing pressure. In response, enterprises possess the motivation for debt structure optimization, long-term financing proportion increases, or the pursuit of alternative channels such as direct financing. Third, at the credit cost level, the confrontation of restricted enterprises with higher financing costs not only directly increases financial burdens, but also influences investment decisions via alteration of project net present values (NPV). High financing costs prompt increased attention to investment efficiency and a propensity for the selection of green projects with higher returns.

3.2 Cost Constraint and Compensation Effects

Under the combined action of cost effects and resource allocation effects, enterprises, aiming for environmental compliance risk reduction and reputation capital maintenance, show a propensity for seeking consumer and investor recognition via technological upgrading and process retrofitting, thereby advancing innovation and green transformation processes. Divergent views exist within academia regarding the interaction between crowding-out and compensation effects. One school of thought posits that compliance pressures and financing constraints induced by green credit elevate corporate costs, thereby crowding out R&D investment and suppressing innovation output. This crowding-out effect is more pronounced in enterprises with tight capital constraints and weak profitability. Conversely, other scholars point out that despite potential short-term cost burden increases, gains from improved environmental management, such as efficiency enhancement and strengthened resource acquisition capabilities, can generate an innovation compensation effect, offsetting compliance costs and releasing innovation momentum. Research by Guo et al. supports this view, finding that environmental regulation and green credit policy encourage increased green innovation attempts by raising tolerance for short-term failure. Empirical evidence suggests that rising cost pressures have not suppressed innovation but rather exerted a significant positive propulsion on corporate innovation output. This indicates the overall dominance of the innovation compensation effect within the green credit policy framework, allowing for corporate response to policy constraints via technological progress and management optimization.

3.3 Signaling and Reputation Effects

The implementation of green credit policy transmits a clear policy orientation signal to the market, with this signal exerting influence on corporate behavior via multiple channels. First, the alteration of market expectations by policy signals. Upon observation of government prioritization of environmental protection, investors, consumers, and other stakeholders execute corresponding adjustments to corporate evaluation standards, placing greater emphasis on corporate environmental performance. This necessitates the proactive elevation of environmental management levels by enterprises for the maintenance and enhancement of market image. Second, the establishment of environmental performance as a critical component of corporate reputation. Against the backdrop of the deepening popularity of green development concepts, superior environmental performance possesses the capacity to generate a reputation premium. The demonstration of social responsibility to the market via environmental performance improvement and environmental information disclosure facilitates the acquisition of increased business opportunities and superior financing conditions. Third, the reinforcement of signaling effects by the green preferences of financial institutions. During the implementation of green credit policy, banks exhibit intensified focus on corporate environmental risk and management capabilities. The direct impact of corporate environmental performance on bank credit ratings and financing conditions results in the formation of a forcing mechanism, prompting corporate prioritization of environmental governance.

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3.4 Risk Management and Corporate Strategic Adjustment

Green credit policy further influences corporate behavior through the modification of corporate risk characteristics and strategic choices. Regarding risk management, environmental risk has evolved into a significant risk factor facing enterprises. The implementation of green credit policy renders the financial consequences of environmental risk more explicit; enterprises with poor environmental performance confront not only environmental penalties but also financing difficulties and rising costs. This compels the incorporation of environmental risk management into the overall risk management framework and the establishment of more robust environmental management systems. Regarding strategic adjustment, in the face of long-term green credit policy constraints, the re-examination of development strategies by enterprises becomes mandatory. Many enterprises have initiated the prioritization of green transformation within their strategies, proactively undertaking industrial upgrading and technological retrofitting. Such adjustments at the strategic level possess greater sustainability and systematicity compared to passive responses, thereby proving more conducive to long-term corporate competitiveness.

4. Key Factors Influencing the Effectiveness of Green Credit Policy

4.1 Internal Corporate Factors

Corporate risk-bearing capacity constitutes a significant internal factor influencing responsiveness to green credit policy. Research indicates a positive correlation between risk-taking capacity and the promotional effect of the *Guidelines* on innovation output in restricted enterprises. Specifically, higher risk tolerance facilitates the conversion of external policy pressure into internal space for trial-and-error and innovation momentum, with management consequently displaying a propensity for the selection of technological upgrading paths requiring higher investment. Within industries restricted by green credit, despite the longer R&D cycles and higher risks/uncertainty associated with invention patents, the possession of strong risk-bearing capacity allows enterprises to maintain high R&D enthusiasm, preventing significant contraction of R&D investment or innovation output reduction due to increased external financing constraints. This indicates that the level of corporate risk-bearing determines, to a certain extent, the capacity for the transformation of policy pressure into transformation momentum.

Existing environmental management levels and capabilities also serve as critical determinants of policy effectiveness. Enterprises with robust environmental management capabilities typically possess established management systems, alongside superior capabilities in environmental information disclosure and performance improvement. Such enterprises enjoy a first-mover advantage in responding to green credit policy, enabling faster compliance with financial institutions' environmental requirements and the occupation of favorable positions in financing competition. Conversely, enterprises with weak environmental management foundations often face disarray when confronting policy constraints; the inability to meet green credit standards in the short term may precipitate a vicious cycle characterized by financing difficulties, insufficient environmental investment, poor environmental performance and further financing exacerbation.

4.2 External Environmental Factors

Government environmental regulation intensity plays a crucial moderating role in the relationship between green credit policy and corporate behavior. Research by Xiong et al. discovers that as consumer preferences shift towards green and healthy directions, a significant decline occurs in the input efficiency of explicit costs directly applied to environmental governance; under the force of environmental regulation, enterprises display a greater propensity for active response via technological innovation, thereby increasing innovation output. In regions with higher environmental regulation intensity, the elevated environmental pressure faced by enterprises correlates with a stronger demand for green financial support. In this scenario, the formation of a policy superposition effect between green credit policy and environmental regulation jointly accelerates corporate green transformation. Conversely, in regions with looser regulation, the relative weakness of environmental pressure results in a diminished forcing effect of green credit policy. Empirical research identifies environmental regulation as a positive regulator in the process of green credit policy influencing corporate innovation, with intensity elevation contributing to the consolidation and amplification of the innovation incentive efficacy brought by the *Guidelines* [12]. This finding offers significant enlightenment for policymakers: the avoidance of unilateral operation of green credit policy in favor of coordination with other policy tools, such as environmental regulation, to form a policy synergy.

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The developmental level of regional financial markets also impacts policy implementation effectiveness. In regions with developed financial markets, the availability of broader financing choices allows enterprises to secure capital support via multiple channels. Upon the tightening of bank loans by green credit policy, the ability to pivot to direct financing channels, such as bond markets and equity financing, facilitates the alleviation of financing pressure. Conversely, in regions with underdeveloped financial markets, the higher corporate reliance on bank loans and the singularity of financing channels result in a potentially stronger constraint effect of green credit policy, yet a weaker corporate coping capacity, leading to potentially more pronounced negative policy shocks.

Regional economic development levels influence policy effectiveness via multiple channels. Developed economic regions typically possess stronger technological innovation capabilities, more complete industrial support systems and more abundant talent reserves, resulting in fewer constraints on corporate green transformation. Simultaneously, the higher attention paid to environmental issues by consumers and investors in developed regions provides stronger market incentives for transformation. Furthermore, the stronger fiscal strength of governments in economically developed regions enables the provision of increased fiscal subsidies and tax incentives for corporate green transformation, contributing to the alleviation of cost pressures and the enhancement of transformation enthusiasm.

4.3 Policy Design Factors

The intensity and implementation rhythm of green credit policy exert a direct influence on policy effectiveness. Excessive policy intensity or overly rapid implementation precipitates adaptation difficulties for enterprises, particularly Small and Medium-sized Enterprises (SMEs), potentially resulting in widespread financing difficulties and operational crises. Conversely, insufficient intensity or sluggish implementation risks the failure to achieve anticipated environmental improvements due to a lack of corporate transformation motivation. Consequently, policy formulation necessitates the identification of an equilibrium between incentive and constraint, ensuring the formation of sufficient pressure for transformation while granting appropriate space and time for corporate adjustment. Research by Lin et al., based on the DSGE model, identifies the capacity of green credit incentive policies, via instruments such as re-lending rates and deposit reserve ratios, to mitigate economic fluctuations to a certain extent, contributing to industrial structure stability and stable economic growth, thereby improving the overall economic structure [13].

The efficacy of green credit policy remains contingent upon the perfection of supporting policies. The absence of corresponding supporting measures, such as fiscal subsidies, tax incentives, and technical support, exposes enterprises to substantial cost pressures and technical barriers during green transformation, significantly discounting policy effectiveness. Research by Ma et al. concerning the orderly adjustment of energy structure and green credit policy regulation indicates the necessity for synergistic coordination between green credit policy, energy policy and industrial policy to better guide energy structure adjustment and industrial transformation upgrading. This suggests the impropriety of viewing green credit policy in isolation, necessitating its consideration within the broader green development policy system.

5. Firm Heterogeneity and Policy Effect Differentiation

5.1 Heterogeneity Based on Property Rights

Given China's specific institutional environmental context, enterprises with differing property right attributes exhibit significant asymmetry in policy response. The possession of greater public credibility by State-Owned Enterprises (SOEs) facilitates superior access to financing trust and opportunities from financial institutions such as banks. Empirical research demonstrates a significant divergence in innovation output between state-owned restricted enterprises and non-SOEs surrounding the implementation of the *Guidelines*, with the policy shock exerting a significant positive effect on the former's innovation performance. Multiple reasons underlie this divergence. First, the possession of government credit endorsement by SOEs provides a natural advantage in financing markets; access to capital support remains relatively facile even amidst green credit constraints. Second, the higher sensitivity of SOEs to policy signals and their informational advantage in policy interpretation and execution allow for faster comprehension of and response to policy intent. Third, the typically larger scale and richer resource endowment of SOEs confer stronger transformation capabilities and risk resistance. However, this difference reflects an imbalance in policy implementation. Non-SOEs,

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particularly private enterprises and SMEs, despite playing a critical role in economic activity, occupy a relatively disadvantaged position regarding the enjoyment of green credit policy benefits [14]. The assurance of policy fairness and the enablement of benefit derivation from green credit policy across different ownership types constitute critical issues for policy refinement.

5.2 Heterogeneity Based on Firm Size

Enterprise scale constitutes another significant factor influencing green credit policy effectiveness. Empirical studies reveal a more pronounced innovation incentive effect of the *Guidelines* on large-scale enterprises. Specifically, following the implementation of the *Guidelines*, large-scale enterprises exhibit a more significant elevation in innovation performance, particularly regarding the increase in patent quantity output, compared to small-scale counterparts. This scale effect allows for explanation from multiple angles. First, the possession of stronger technical R&D capabilities and more complete innovation systems by large-scale enterprises confers a technical advantage in meeting policy requirements. Second, the diversification of financing channels for large-scale enterprises, enabling capital acquisition via bond issuance or equity financing when bank credit is restricted, provides greater financing flexibility. Third, the typically superior perfection of environmental management systems and higher quality of environmental information disclosure by large-scale enterprises facilitate recognition and support from financial institutions. In contrast, SMEs exhibit distinct disadvantages in capital, technology, and management. Confronted with green credit policy constraints, SMEs face greater transformation pressure despite relatively weaker transformation capabilities. This dual dilemma risks the marginalization of SMEs in the green transformation process, potentially leading to existential crises.

5.3 Heterogeneity Based on Industry Characteristics

Enterprises across different industries display divergent response characteristics to green credit policy. Heavy pollution industries, such as chemicals, steel, and cement, constitute the primary targets of green credit policy constraints, facing stricter credit management and higher financing costs. Simultaneously, however, these industries possess greater emission reduction potential and stronger transformation demand. Research indicates that within heavy pollution industries, technology-intensive enterprises demonstrate stronger policy response capabilities than labor-intensive ones. The possession of stronger R&D capabilities and higher technological levels by technology-intensive enterprises enables green transformation via technological innovation. Conversely, the weak technological foundation of labor-intensive enterprises exacerbates transformation difficulty. Furthermore, policy response differentiation exists based on positioning within the industrial chain. Upstream enterprises, such as energy and raw material producers, represent primary pollution sources and face maximal policy pressure; downstream enterprises, despite fewer direct emissions, remain subject to the impact of cost transmission from upstream transformation costs [15].

6. Shortcomings of Existing Research and Directions for Future Study

6.1 Major Contributions and Deficiencies of Existing Research

A systematic review of existing literature reveals the achievement of rich results by the academic community in the domain of green credit policy and corporate green transformation. Primary contributions manifest in several aspects: First, regarding research perspectives, the expansion from singular environmental effect studies to multi-dimensional examinations encompassing economic, innovation, and financial effects, resulting in the formation of a comprehensive analytical framework. Second, regarding research methodologies, the extensive application of causal identification methods, such as quasi-natural experiments and Difference-in-Differences (DID), has enhanced the credibility of research conclusions. Notably, the utilization of the introduction of the *Green Credit Guidelines* as an exogenous shock provides an ideal quasi-natural experimental scenario for policy effect evaluation. Third, regarding transmission mechanisms, the deep exploration of multiple channels through which green credit policy influences corporate behavior, including resource allocation, cost constraint, and signaling effects, has enriched theoretical understanding. Fourth, regarding heterogeneity analysis, the attention paid to differentiated responses across varying property rights, scales, and industries provides critical references for policy optimization.

Despite significant progress, certain deficiencies remain: First, regarding time span, the preponderance of focus on short-to-medium-term effects following policy implementation results in an

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insufficiency of long-term effect tracking. Given that green transformation is a long-term process, the potential lag and cumulative nature of policy effects necessitate research over longer time horizons. Second, regarding mechanisms, despite the identification of multiple transmission channels, the investigation into the relative importance and interactive relationships among these channels remains inadequate. Specifically, the provision of detailed micro-evidence regarding the occurrence and conditions of the innovation compensation effect requires strengthening. Third, regarding regional disparity, the reliance of existing studies on national or provincial data leads to insufficient attention to policy effect variations at the prefecture or county levels. Given the imbalance in China's regional development, the conduct of finer-grained regional research holds significant value. Fourth, regarding dynamic evolution, the study of the laws governing changes in policy effects over time is lacking. Significant differences may exist across the initial, intermediate and mature stages of policy implementation. Furthermore, corporate adaptive learning and strategic adjustment constitute dynamic processes requiring deep exploration. Fifth, regarding international comparison, a lack of comparative research with green credit policies in other nations exists. International comparison would facilitate the summarization of the pros and cons of different policy models, offering lessons for domestic policy refinement.

6.2 Future Research Directions

Based on the deficiencies of existing research, future deepening and expansion are possible in the following directions: (1) Policy Synergy Research. Green credit policy does not exist in isolation but constitutes a green development policy system alongside environmental regulation, fiscal subsidies, tax incentives and carbon trading. Future research focus should center on the synergistic, substitution, and complementary effects among different policy tools. For instance, does the simultaneous implementation of green credit and carbon trading policies create a superposition effect on corporate behavior? What constitutes the optimal corporate response strategy under different policy combinations? (2) Micro-mechanism Research. Despite the identification of various mechanisms, the black box within these mechanisms requires opening. Future research could utilize enterprise survey data and case studies for the deep exploration of policy influence on specific corporate decision-making processes. Questions such as management perception of policy signals, the trade-off between short-term costs and long-term benefits, and selection among different transformation paths are critical for the understanding of policy effects. (3) Dynamic Effects and Long-term Impact Research. The manifestation of different characteristics in policy effects over time is probable. In the short term, corporate response may rely mainly on end-of-pipe governance; in the medium term, the initiation of process retrofitting and technological upgrading; and in the long term, the realization of fundamental business model shifts. Future research should adopt longer time spans for the tracking of dynamic effects and long-term impacts, exploring the time-evolution laws of policy effects. (4) Deepening of Enterprise Heterogeneity Research. While existing research identifies heterogeneity factors like property rights and scale, the excavation of underlying causes remains insufficient. Future exploration could address: Why do differences in policy response exist across enterprise types? Does this difference stem from capability disparities or willingness disparities? How can the design of more targeted policies reduce the gap in policy effects between different enterprises? (5) Negative Effects and Policy Cost Research. Existing research focuses largely on positive effects, with insufficient attention to potential negative effects. For example, does the policy lead to excessive exit of certain enterprises? Is there a negative impact on employment? What are the costs of policy implementation? These issues relate to the comprehensive evaluation and optimization of policy and require increased attention.

7. Policy Implications and Suggestions

Based on the foregoing review, the following policy recommendations are proposed: First, the establishment of a more precise classification management mechanism. While maintaining financing constraints on restricted industries, the provision of moderate financing support to enterprises actively undertaking green transformation is necessary, realizing a differentiated policy of support and restriction. Avoidance of one-size-fits-all approaches is crucial; instead, differentiated treatment based on actual corporate environmental performance and transformation efforts is recommended. Second, the optimization of policy evaluation and supervision mechanisms. The establishment of a dynamic evaluation system for green credit policy effects allows for the timely tracking of implementation results and the adjustment of policy intensity and direction based on actual conditions. The strengthening of supervision over financial institutions' execution of green credit policy ensures substantial policy

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implementation. Third, the strengthening of policy coordination. Coordination between green credit policy and environmental regulation, fiscal/tax policy, and industrial policy is essential for the formation of policy synergy and the improvement of overall efficacy. The establishment of departmental coordination mechanisms avoids conflict and duplication among policies.

Environmental information disclosure serves as the foundation for effective green credit policy implementation. First, the establishment of unified environmental information disclosure standards. The formulation of clear disclosure guidelines, regulating content, format, and timing, improves information comparability and utility. Second, the expansion of the mandatory disclosure scope. Currently limited to certain listed companies, the gradual expansion of mandatory disclosure, particularly to enterprises in restricted industries is suggested. Third, the intensification of penalties for false disclosure. The establishment of verification mechanisms and the increasing of penalties for false disclosure or misleading statements enhances the authenticity and reliability of disclosures.

Given the significant heterogeneity in policy effects, attention to the differentiated needs of different enterprise types is required. First, increased attention to non-state-owned enterprises (non-SOEs) and SMEs. Given their relative disadvantage in financing markets, these enterprises face greater difficulties in green credit policy implementation. The establishment of targeted support mechanisms, such as green development funds for SMEs and financing guarantees, facilitates their smooth transformation. Second, the encouragement of financial innovation and the development of green financial products suitable for different enterprise types. Examples include flexible green credit products for SMEs and green bonds/asset securitization for large enterprises. Third, the strengthening of green finance knowledge training and policy publicity. Training and consultation facilitate better corporate understanding and utilization of green finance policies, improving awareness and usage efficiency.

Considering the impact of regional disparities on policy effectiveness, the optimization of regional financial ecological environments is suggested. First, the acceleration of financial market construction in underdeveloped regions. The introduction of financial institutions and the development of local finance improve service coverage and availability, creating conditions for corporate financing structure optimization. Second, the promotion of regional financial cooperation. Encouragement of service extension by financial institutions from developed to underdeveloped regions realizes cross-regional financial resource allocation and narrows the financial development gap. Third, the creation of a favorable credit environment. The strengthening of social credit system construction and the perfection of credit information sharing mechanisms reduce financial transaction costs, creating a favorable environment for diversified corporate financing. Green transformation is a long-term, complex process requiring the joint effort of government, financial institutions, enterprises and society. As a critical market-based policy tool, the efficacy of green credit policy depends on coordination with other tools and continuous optimization based on practice. It is hoped that this review provides references for subsequent research, inspiration for policy refinement, and contributions to the comprehensive green transformation of China’s economy and society.

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