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Research on the Driving Path of ESG Investment in Green Finance Development under Policy Leadership --An Analysis Based on Typical Case Evidence

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Abstract

Against the backdrop of global green development transformation and China's advancement of the dual-carbon goals, green finance has become crucial support for sustainable economic development. The guiding role of policy on ESG investment is becoming increasingly evident. However, further research on how policy leverages ESG investment to promote green finance development is needed. This paper employs literature research to review relevant theories and the current research status, uses case analysis to examine typical cases, focuses on the policy-led perspective to analyze driving paths, and combines typical cases with empirical analysis for multidimensional verification. It systematically identifies paths through which policy drives green finance development by guiding the dissemination of ESG investment concepts, promoting the development of the ESG investment market, and improving support mechanisms, supported by multidimensional case evidence. The study revealed that policy plays a key role in the ability of ESG investment to drive green finance development. The identified driving paths have practical guiding significance and can provide references for optimizing policies and market entity behaviors.

Keywords

policy leadership, ESG investment, green finance, driving path

1. Introduction

Frequent extreme weather events caused by global climate change and the accelerating degradation of ecosystems profoundly alter the underlying logic of global economic development. The traditional high-energy-consumption, high-emission economic growth model faces severe challenges. Promoting the transition to a low-carbon, green economy has reached a consensus within the international community. Green finance, as a key mechanism for directing social capital toward environmental protection, energy conservation, clean energy, and other green industries, is increasingly prominent in its core role. It not only provides financial support for environmental governance and green technology innovation but also encourages enterprises to optimize resource allocation and accelerate the systematic transformation of economic development models through price signals and market mechanisms (Zhang and Fan, 2015).

As the world's largest developing country, China actively responds to the global call for climate governance by proposing the "Carbon Peak, Carbon Neutrality" goals, injecting strong momentum into the construction of its green financial system. To date, China has initially built a multitiered green financial product system

encompassing green credit, green bonds, green insurance, green funds, etc. The scale of the green finance market continues to expand, and the policy support framework is continuously improving (Ma, 2016, Green Finance Committee, 2023). ESG investment, as an important component of green finance, has rapidly emerged, providing more precise guidance for capital flow toward green industries.

A review of domestic and international research shows that scholars generally recognize the key role of policy in promoting green finance development, especially after the proposal of the "dual carbon" goals. Multiple studies confirm that policy tools such as carbon market mechanisms and green credit guidelines positively influence the expansion of the scale of ESG investment (Chen, 2021). Research on the interaction between ESG investment and green finance indicates that improving ESG information disclosure systems enhances the pricing efficiency of green financial products and that the maturation of the green finance market, in turn, promotes the optimization of the ESG investment ecosystem (Wu, 2020). Existing research still has significant shortcomings: first, the analysis of specific paths through which policy drives ESG investment is relatively broad, lacking a detailed examination of the mechanisms of different policy tools; second, the combination of case studies and empirical analysis is not tight enough, often relying on macro data to verify correlations, with insufficient tracking of changes in microlevel corporate ESG investment behavior under policy incentives.

This paper focuses on the mechanism and effects of policy-driven ESG investment under "dual carbon" goals, concentrating on core questions such as how China's green finance-related policies influence corporate ESG investment decisions through different paths and the differences in the implementation effects of various policy tools. It adopts a research methodology of "policy text analysis - case comparison - empirical testing." First, China's green finance and ESG-related policy texts from 2015--2024 are organized to construct a policy tool classification framework. Second, typical enterprises from high-energy-consuming industries and new energy industries are selected for case comparison, and their adjustments in ESG investment strategies under policy influence are analyzed. Finally, panel data from A-share listed companies are used to empirically test the effects of different policy tools on corporate ESG investment intensity.

The research significance of this paper lies in the following: at the theoretical level, it can enrich the research on the micromechanisms of policy-driven ESG investment and provide a new analytical perspective for the interactive relationship between green finance and ESG investment; at the practical level, it can provide references for policymakers to optimize green finance policy tools and improve the efficiency of guiding ESG investment, assisting the green transformation of the economy under the "dual carbon" goals.

2. Relevant theoretical foundations

2.1 ESG investment theory

2.1.1 Concept and Connotation of ESG Investment

ESG investment is an investment approach and asset management method that comprehensively considers a company's environmental, social, and governance performance. It overcomes the limitations of traditional investment, which focuses solely on financial indicators by incorporating corporate nonfinancial factors into the investment decision-making process, aiming to achieve long-term financial returns and positive social and environmental impacts by investing in companies with outstanding sustainable development performance.

The environmental dimension primarily assesses a company's impact on the ecological environment, focusing on analyzing its performance in areas such as carbon emissions, waste management, energy use, natural resource consumption, and biodiversity protection. Many leading companies are striving to reduce greenhouse gas emissions. Some tech giants have set clear carbon neutrality targets, contributing to emission reduction through optimized production processes and the use of renewable energy. Some companies have launched product recycling programs, reducing waste generation and promoting recycling, achieving both environmental protection and efficient resource utilization. Efficient energy use and the development of renewable energy have become major trends. Companies are investing in solar, wind, and other projects to improve energy efficiency, pointing toward a more sustainable future that is less reliant on traditional fossil fuels.

The social dimension involves the relationship between the company and its stakeholders, including employees, suppliers, customers, and the community. Safeguarding employee rights, including fair compensation, a good working environment, and career development opportunities, is crucial. Some companies provide comprehensive training systems to help employees upgrade their skills and achieve career growth, which enhances employee loyalty and overall corporate competitiveness. Supply chain responsibility requires companies to ensure that their suppliers adhere to fair and legal operating principles and protect workers' rights. Product safety and quality are directly related to consumer interests. Only by providing safe and reliable products and services can companies win market trust. A company's contribution to the community, such as participating in public welfare activities and supporting community development, affects its social reputation.

The governance aspect focuses on the company's internal management structure and decision-making mechanisms. Board structure, including member independence and diversity, is important. Independent directors can provide objective opinions for company decisions, avoiding the risks associated with insider control. A diverse board, including members of different genders, ages, and professional backgrounds, helps broaden decision-making perspectives and improve their scientific nature. Information disclosure transparency affects investors' trust in the company. Timely, accurate, and complete disclosure of financial status, strategic plans, and ESG-related information allows investors to make wiser decisions. A company's anticorruption and compliance status are important standards for measuring governance levels. A good compliance system helps companies avoid legal risk and build a positive corporate image.

2.1.2 Principles and Strategies of ESG Investment

The Principles for Responsible Investment (PRI) are among the core principles of ESG investment and are launched jointly by the United Nations Environment Programme Finance Initiative (UNEP FI) and the UN Global Compact (2016). These principles advocate that investors incorporate ESG factors into investment decisions and active ownership practices to promote the sustainable development of the global financial system. Signatory investors commit to fully considering environmental, social, and governance factors in investment analysis, portfolio construction, and corporate engagement, aiming to promote improved ESG performance in companies through investment activities and achieving coordinated development of the economy, society, and environment.

Currently, ESG investment strategies are mainly divided into seven categories: ESG integration, positive screening, negative screening, corporate engagement and shareholder action, impact investing, sustainability-themed investing, and norm-based screening. Common methods include ESG integration, positive screening, negative screening, and impact investing. ESG integration is the systematic and explicit inclusion of ESG factors in financial analysis, considering both ESG and financial factors and focusing on analyzing the potential financial impact of ESG issues. Positive screening involves selecting the best-performing projects, companies, or sectors in terms of ESG performance within a category or level through weighted analysis. Negative screening excludes certain industries, companies, or businesses on the basis of specific ESG criteria. Common exclusion criteria include specific product categories (e.g., weapons, tobacco), corporate behaviors (e.g., corruption, human rights violations, animal testing), and other controversial practices. Impact investing targets specific projects that address social or environmental problems, aiming to generate positive social and environmental impacts alongside financial returns, creating value and benefits for stakeholders.

2.2 Green Finance Theory

2.2.1 Concept and Scope of Green Finance

2.2.1.1 Definition of Green Finance

There is a basic consensus on the concept of green finance in academia and industry, but differences in research perspectives lead to variations in emphasis. From a policy practice perspective, green finance refers to the total financial activities where financial institutions incorporate ecological goals such as environmental improvement, climate change response, and resource conservation and efficient utilization into the core consideration of investment and financing decisions. This involves innovating financial products and services to guide social capital toward green industries while restricting financing for high-pollution, high-energy-consumption, high-emission ("Two Highs and One Excess") projects (People's Bank of China, 2022). From a

theoretical essence perspective, the core of green finance lies in internalizing environmental externalities through financial mechanism innovation, correcting the "neglect" of environmental factors by the traditional financial system, and ultimately achieving the synergistic unity of economic, social, and ecological benefits (G20 Green Finance Study Group, 2016) .

Compared with traditional finance, green finance has three significant characteristics: first, it is goal oriented, with clear additional objectives for ecological environment improvement, not solely pursuing profit maximization; second, it involves special risks, requiring additional assessment of the impact of environmental risks such as climate policy changes, environmental accidents, and technological iteration on asset quality; and third, it has multiple benefits, generating both operational benefits for financial institutions and public environmental benefits such as emission reduction, carbon reduction, and ecological restoration through supporting green projects.

2.2.1.2 Core scope of green finance

On the basis of differences in financial product forms and service scenarios, the scope of green finance can be divided into three major categories: basic products, derivative instruments, and supporting services. The specific forms, application scenarios, and characteristics of each category are shown in the table below:

Table 1: Classification of Core Categories of Green Finance, along with Their Specific Forms, Application Scenarios and Characteristics

Category	Specific Form	Application Scenarios and Characteristics
Basic Financial Products	Green Credit	Special loans issued by banks and other credit institutions for green projects such as photovoltaic power plant construction, urban sewage treatment, and new energy vehicle manufacturing. Typically, offer interest rates 5%-10% lower than ordinary loans of the same term, with loan maturities matching project cash flow cycles (e.g., 20-25 years operation period for PV projects). Some require signing "environmental risk compensation agreements" (increasing interest rates if emission reduction targets are not met) (China Banking Association, 2023) .
	Green Bonds	Fixed-income products issued by enterprises, local governments, or multilateral institutions (e.g., World Bank, Asian Development Bank). Proceeds must be 100% used for green projects specified in the "Green Bond Endorsed Projects Catalog". Require quarterly disclosure of fund usage progress (e.g., proportion of funds invested in wind power projects) and environmental benefit indicators (e.g., annual CO2 reduction, water savings tons). Information disclosure requirements are stricter than for ordinary bonds (China Green Finance Committee, 2022) .
	Green Funds	Include government-guided green industry funds (e.g., National Green Development Fund) and private green equity investment funds. Mainly invest in green technology R&D companies (e.g., carbon capture technology companies) and new energy industry chain companies (e.g., lithium battery material manufacturers). Some funds set "green thresholds", requiring investee companies to have an ESG rating of BBB or above, and require continuous postinvestment tracking of corporate environmental compliance (Asset Management Association of China, 2023) .
Derivative Financial Instruments	Carbon Emission Derivatives	Financial derivatives with carbon emission allowances as underlying assets, including carbon futures, options, swaps, etc. Mainly used to help high-energy-consumption enterprises (e.g., steel, cement) hedge carbon price fluctuation risks. Pilot carbon futures trading has been launched at the Shanghai Environment and Energy Exchange, with the first trading instrument being "Shanghai Carbon Allowance (SHEA) Futures", reaching a trading volume of 120 million tons in 2023 (Shanghai Environment and Energy Exchange, 2024) .
	Green Credit Asset Securitization	Banks package eligible green credits and issue asset-backed securities (ABS) through special purpose vehicles (SPVs), transforming illiquid credit assets into tradable securities. This enhances the liquidity of green credit assets and broadens funding sources for bank green credit. For example, in 2023, ICBC issued BCE 2023 Phase I Green Credit Asset-backed Securities" with a scale of 5 billion CNY, with underlying assets all being loans for new energy projects (ICBC, 2023) .
Supporting Services	Green Insurance	Includes environmental pollution liability insurance, green building performance insurance, agricultural weather index insurance, etc.: ① Environmental pollution liability insurance provides coverage for compensation liability arising from sudden

Category	Specific Form	Application Scenarios and Characteristics
		environmental accidents (e.g., chemical wastewater leakage). China currently mandates heavily polluting enterprises to purchase it. ② Green building performance insurance ensures green buildings (e.g., LEED-certified buildings) meet expected energy-saving standards during operation. If standards are not met, the insurance company covers energy-saving renovation costs (Insurance Association of China, 2022) .
	Green Finance Consulting & Rating	Professional services provided by third-party institutions, including: ① Environmental risk assessment (e.g., ecological impact assessment during project construction); ② Green project certification (e.g., project classification under the EU's Sustainable Finance Disclosure Regulation (SFDR)); ③ ESG rating (e.g., ESG rating reports issued by CCXI Green Finance), providing decision-making reference for investors to identify green projects and manage environmental risks (CCXI Green Finance, 2023).

2.2.2 Theoretical Support for Green Finance Development

Green finance is not an isolated financial innovation. Its development logic is deeply rooted in classical economic theories such as externality theory, sustainable development theory, and information asymmetry theory. These theories explain "why green finance is needed" (i.e., manifestations of market failure) and provide the theoretical basis for "how to develop green finance" (i.e., the path combining policy intervention and market mechanisms), forming the core support of the green finance theoretical system.

2.2.2.1 Externality theory: The core logical starting point of green finance

Externality theory was first proposed by Marshall in *Principles of Economics* (1890) and later refined by Pigou in *The Economics of Welfare* (1920), forming classic solutions such as the "Pigouvian tax" (Pigou, 2006). Its core idea is that when the actions of an economic entity impose costs or confer benefits on other entities that are not reflected in market prices, externalities arise—"negative externalities" cause harm to others, whereas "positive externalities" bring benefits. The existence of externalities leads to a deviation from Pareto optimality in resource allocation, resulting in market failure.

In the environmental field, externality problems are particularly prominent and directly lead to the "green absence" of the traditional financial system:

1. **Negative Externalities and Overfinancing of Polluting Projects:** Production activities of highly polluting enterprises (e.g., chemical plants discharging wastewater and thermal power plants emitting sulfur dioxide) cause water pollution and harm residents' health. These environmental costs are not included in the private costs of the enterprise (e.g., the company does not pay the full cost for pollution damage), making the "private benefit" of polluting projects higher than the "social benefit." Traditional financial institutions, which neglect environmental costs, tend to provide low-cost financing for such projects, leading to the overexpansion of polluting projects.

2. **Positive Externalities and Underfinancing of Green Projects:** Green projects (e.g., wind power projects and forest carbon sink projects) can reduce carbon emissions and improve the ecological environment. The environmental benefits they generate are shared by society (e.g., reducing regional air pollution levels), but project investors cannot fully capture these benefits through market mechanisms (e.g., cannot charge residents enjoying cleaner air), making the "private benefit" of green projects lower than the "social benefit." Traditional financial institutions, owing to this benefit "spillover," lack investment willingness, leading to financing difficulties and high costs for green projects (Pigou, 1920) (Pigou, 2006).

Green finance addresses this dilemma through financial mechanism innovation in two ways: "inhibiting negative externalities" and "incentivizing positive externalities".

3. **For Negative Externalities:** Increasing the financing costs for highly polluting projects (e.g., implementing interest rates 10%-15% higher than ordinary projects for "Two Highs and One Excess" projects), levying environmental risk premiums (e.g., requiring polluting enterprises to provide additional collateral), internalizing the pollution cost into the private cost of the enterprise, and forcing enterprises to reduce pollution emissions.

4. **For Positive Externalities:** By providing green credit interest rate discounts, green bond fiscal interest subsidies (e.g., the government subsidizing 2--3 percentage points of interest), green fund risk compensation (e.g., the government bearing 30% investment losses), and other methods to compensate for the project party's 收益 loss, increase the "private benefit" of green projects, and guide capital toward projects with positive externalities. China's *Green Credit Guidelines* explicitly require banks to restrict credit lines for "Two Highs and One Excess" projects and set loan interest rates not lower than the loan prime rate (LPR) for the same term while allowing interest rate discounts of 5%-10% for green projects. This essentially internalizes environmental externalities through financial means, correcting market failure (China Banking and Insurance Regulatory Commission, 2020)(CBIRC, 2020).

2.2.2.2 Sustainable Development Theory: The Long-term Value Orientation of Green Finance

Sustainable development theory originated from the report *"Our Common Future"* (also known as the *Brundtland Report*) published by the World Commission on Environment and Development (WCED) in 1987. Its core definition is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs," emphasizing the "three-dimensional coordination" of economic growth, social equity, and ecological protection, rather than the single dimension of "economic growth priority" in traditional development models(World Commission on Environment and Development, 1997).

The traditional financial system, with its goal of "short-term profit maximization," has inherent conflicts with the concept of sustainable development:

1. **From a time dimension perspective,** traditional finance prefers short-term (1–5 years), high-return projects, whereas green projects (e.g., nuclear power projects, interbasin water transfer projects) often have long investment cycles (10–30 years) and low short-term returns but significant long-term environmental benefits, making it difficult to meet the short-term profitability requirements of traditional finance.

2. **From a resource allocation perspective,** traditional finance tends to lean toward short-term, high-profit industries that are high-energy-consuming and highly polluting (e.g., traditional steel, chemicals), leading to excessive resource consumption and environmental pollution, violating the principle of "intergenerational equity"—excessive consumption of ecological resources by the current generation will lead to survival crises of resource depletion and climate deterioration for future generations.

Green finance embeds sustainable development goals into the entire process of financial activities, promoting long-term sustainable development through three main paths:

3. **Capital Allocation Optimization:** Green finance guides capital flow through differentiated pricing and market access restrictions, favoring green industries with positive environmental externalities and restricting "brown" industries with negative externalities, thereby correcting the misallocation of resources caused by traditional finance and promoting the transformation of economic development toward green and low-carbon modes.

4. Technological innovation incentives: Green technologies (e.g., hydrogen energy storage technology, carbon capture and storage (CCS)) are key to achieving a green transition but face the characteristics of long R&D cycles, high risk, and large investment, leading to insufficient private sector investment willingness. Green finance provides funding support for green technology R&D and industrialization through green fund equity investment, green credit special support, etc., thus reducing technological innovation risk. For example, the National Green Development Fund invested 15 billion CNY in 2023 to support carbon capture technology R&D, leveraging over 50 billion CNY in social capital investment (National Green Development Fund, 2024)(NGDF, 2024).

5. **Intergenerational Cost Amortization:** The benefits of green projects are "intergenerational"—environmental benefits from wind power projects or ecological engineering invested in and constructed by the current generation can benefit future generations (e.g., reducing carbon emissions, improving climate). Green finance uses tools such as issuing long-term green bonds (mostly 10--30 years) and green REITs (real estate investment trusts) to reasonably split the project costs between "investment generation" and "benefit generation," meeting the intergenerational equity requirements of sustainable development (World Commission on Environment and Development, 1987) (World Commission on Environment and Development, 1997).

2.2.2.3 Information Asymmetry Theory: Basis for Risk Management in Green Finance

Information asymmetry theory was proposed by Akerlof in The Market for "Lemons": quality uncertainty and the market mechanism (1970) (Akerlof, 2001). The core idea is that in market transactions, the information possessed by the two parties differs, i.e., there is an "information advantage party" and an "information disadvantage party." The information advantage party may use the information gap to harm the interests of the disadvantage party, leading to "adverse selection" (where inferior products drive out good products before the transaction due to ex ante information asymmetry) and "moral hazard" (where one party's behavior deviates from the agreement after the transaction due to ex post information asymmetry), ultimately reducing market efficiency.

In the field of green finance, information asymmetry problems are more prominent because of characteristics such as "strong professionalism of environmental information" and "difficulty in verifying green attributes," directly affecting the effectiveness of green finance, which can be reflected in three levels:

1. Adverse selection at the project identification level: The financing party (e.g., enterprise) has more complete knowledge of the true environmental benefits of a green project (e.g., actual emission reduction) and its technical feasibility (e.g., maturity of new energy technology). It may engage in "greenwashing behavior" (e.g., packaging an ordinary real estate project as a "green building project") to exaggerate the project's green attributes and obtain green finance support. The investing party (e.g., banks, fund companies), lacking environmental expertise and assessment tools, finds it difficult to identify the authenticity of the project accurately. This ultimately leads to high-quality green projects having higher financing costs than inferior projects because of "unwillingness to disguise," resulting in adverse selection where "bad money drives out good money."

2. Moral Hazard at the Fund Usage Level: After obtaining green funds, the financing party may violate the agreement and divert funds to nongreen projects (e.g., using green bond proceeds for real estate investment or expansion of ordinary manufacturing). The investing party, owing to high monitoring costs (e.g., needing onsite verification of fund flow, environmental benefits), finds it difficult to monitor in real time, leading to green funds "diverting from real to virtual" and not being truly used for green projects.

3. Information barriers at the risk assessment level: Environmental risks (e.g., carbon price increases raising costs for high-energy-consumption enterprises, extreme weather reduces power generation at photovoltaic plants) are highly professional and uncertain. Investing parties, especially SMEs, lack environmental risk assessment models and data, making it difficult to accurately quantify the impact of environmental risk on asset quality. This leads to "risk misjudgment" risks in the green finance business (Akerlof, 2001).

To address information asymmetry, the green finance system has built a multilevel information disclosure and risk control mechanism:

1. Mandatory Information Disclosure System: Policy regulations clarify green finance information disclosure requirements, reducing "information hiding." For example, China's 2023 Guidelines for the Management of Investor Relations of Listed Companies require mandatory disclosure of ESG information by listed companies, including environmental pollutant emissions and the proportion of green revenue. The Green Bond Information Disclosure Guidelines require issuing entities to disclose fund usage quarterly (e.g., amount and proportion invested in green projects) and environmental benefit indicators (e.g., emission reduction, water savings) and to publish annual special reports on environmental benefits (China Securities Regulatory Commission, 2023) (CSRC, 2023)

2. Third-party Certification Mechanism: Introduce independent environmental assessment (e.g., the China Quality Certification Centre (SGS)) to certify green projects and issue special assessment reports, reducing the information verification costs for investors. For example, green bonds must be certified by a third-party organization before issuance that "the use of raised funds complies with green standards," and green credit projects require third-party assessment confirming "controllable environmental risks" (China Green Finance Committee, 2023).

3. Application of Regulatory Technology (RegTech): Utilize big data, satellite remote sensing, the Internet of Things (IoT), and other technologies to achieve dynamic monitoring of green projects. For example, banks use satellite remote sensing to monitor the actual power generation of photovoltaic plants to verify project

benefits, use IoT devices to monitor emission indicators of sewage treatment plants in real time to verify environmental benefits, and use big data to analyze corporate environmental violation records to assess environmental risks, achieving "technology-enabled risk control" (China Banking Association, 2023) (CBA, 2023).

2.2.2.4 Public Goods Theory: The Basis for Policy Intervention in Green Finance

Public goods theory, proposed by Samuelson (1954) [9], divides goods into public goods and private goods. Public goods are characterized by nonrivalry (one person's use does not affect another's use) and nonexcludability (cannot prevent others from using them). Clean air, a stable climate, and other ecological environment resources are typical public goods.

Owing to the nonexcludability of public goods, the private sector finds it difficult to capture all benefits through market mechanisms, leading to insufficient private investment willingness and creating a "free-rider" phenomenon—enterprises are unwilling to actively invest in green projects but enjoy the environmental improvements brought about by other enterprises' emission reductions. In this situation, relying solely on market self-regulation cannot meet society's demand for ecological public goods. Government policy intervention is needed to guide the development of green finance (Samuelson, 2018). The main methods of government intervention include the following:

1. Fiscal Subsidies and Tax Incentives: Implementing fiscal interest discounts for green credit, exempting corporate income taxes on green bond interest income, and reducing the financing costs of green financial products.

2. **Government-guided Funds:** Establishing national and provincial-level green industry guidance funds, leveraging equity investment to drive social capital investment. For example, China's National Green Development Fund has a total scale of 88.5 billion CNY, focusing on investing in green projects in the Yangtze River Economic Belt.

3. **Standard Setting and Regulatory Constraints:** Issuing the *Green Finance Standard System* to unify green project identification standards. Simultaneously, the incorporation of green credit into the Macro Prudential Assessment (MPA) to assess the green finance performance of financial institutions forces them to increase green investment (Ministry of Finance, 2021).

2.3 Policy impact theory

2.3.1 Government Intervention Theory

Market failure theory reveals that issues such as environmental externalities in the fields of green finance and ESG investment cause market mechanisms to fail to achieve optimal resource allocation. Government intervention through policies to guide resources toward green areas is justified, providing theoretical support for government involvement in green finance and ESG investment.

2.3.2 Policy transmission mechanism theory

This theory aims to explain the process through which policies (such as monetary policy and fiscal policy) affect the behavior of market entities through various channels, for example, the pathways through which these policies affect corporate financing and investment decisions. This theory provides an important theoretical basis for analyzing the specific impact of policies on ESG investment and green finance.

3. Current Status of ESG Investment and Green Finance Development under Policy Leadership

3.1 Policy System Review

3.1.1 3.1.1 National-level policies

The national level has issued a series of important policy documents on green finance and ESG investment. The *Guidance on Building a Green Financial System* (Ma, 2016) is a typical representative. Analyzing the policy objectives, main content, and implementation effects of these policy documents can clearly

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3.1.2 Local-level policies

Regions such as Guangdong and Zhejiang have introduced supporting policies with local characteristics in the fields of green finance and ESG investment, exemplified by the establishment of green development funds and subsidies for green enterprises. An in-depth introduction to the features of these local supporting policies and their role in promoting regional ESG investment and green finance development can provide useful references for other regions.

3.2 Current Status of ESG Investment Development

3.2.1 Investment scale and growth trends

Data from sources such as Wind Info constitute an important basis for analyzing the development trends of ESG investment in China. Analyzing the number of ESG investment products and changes in the asset management scale can intuitively present the expansion of China's ESG investment market and reflect the vitality of development in this field.

3.2.2 Investment Entities and investment strategies

Public offering funds, bank wealth management products, insurance funds, etc., are the main participants in the ESG investment field. Analyzing the participation of these investment entities and the investment strategies they adopt can reflect the characteristics of diversified market entities and diversified strategies in ESG investment, highlighting the richness and complexity of the market.

3.3 Current Status of Green Finance Development

3.3.1 Green Financial Products and Services

Green credit, green bonds, green funds, green insurance, etc., collectively constitute the product and service system of green finance. Elaborating on the development scale, investment direction, and innovation of these products and services, combined with statistical data from the People's Bank of China and Wind data, can provide a comprehensive understanding of the current development status of green finance at the product and service levels.

3.3.2 Market System Construction

The healthy development of green finance is inseparable from a sound market system. Introducing progress in the green finance standard system, market infrastructure construction, and participant cultivation can illustrate the degree of perfection of the green financial market system and provide a reference for further promoting the development of green finance.

4. Analysis of the Driving Path of ESG Investment in Green Finance Development under Policy Leadership

4.1 Policy Guides the Dissemination of ESG Investment Concepts

4.1.1 Policy Propaganda and Education Measures

1. **Clear Orientation through Policy Documents:** Regulatory agencies such as the central bank and the China Securities Regulatory Commission (CSRC) have issued documents such as the *ESG Investment Operation Guidelines* and *Guiding Opinions on the Integrated Development of Green Finance and ESG*, clearly defining the intrinsic connection between ESG investment and the "Dual Carbon" goals and sustainable development strategy, strengthening its theoretical status in the market. For example, the new listed company regulations issued by the CSRC in 2023 made ESG information disclosure mandatory, highlighting the importance of nonfinancial indicators in market evaluation from an institutional perspective (CSRC, 2023).

2. **Promotion of Industry Practical Training:** Government departments, in conjunction with organizations such as the China Banking Association and the Asset Management Association of China,

conduct practical ESG investment training for financial institution investment decision-makers and corporate management, covering practical application modules such as indicator analysis and risk assessment. For instance, the National Green Development Fund organizes an "ESG Investment Practice Summit" annually, inviting international professional institutions to share cases and helping integrate the concept with the local market.

3. **Popularization of social awareness:** Using mainstream media, public service announcements, and other channels to convey the positive role of ESG investment in environmental improvement and social development to the public and selecting typical cases (e.g., a new energy enterprise reducing financing costs by 15% through optimized ESG management) for demonstration, enhancing social acceptance of the concept.

4.1.2 Impact of Concept Dissemination on Market Entity Behavior

1. **Financial Institutions adjust decision-making logic:** Integrating ESG indicators into investment evaluation systems, such as banks adding dimensions such as "carbon emission intensity" and "employee rights protection" in green credit approval; fund companies adopting negative screening mechanisms to exclude highly polluting enterprises when issuing ESG-themed products.

2. **Enterprises Proactively Optimize ESG Performance:** To obtain financing convenience, enterprises specifically improve their ESG levels. For example, high-energy-consumption enterprises formulate carbon reduction plans to meet green bond issuance requirements, and manufacturing enterprises improve supply chain ESG management to reduce upstream and downstream environmental risk.

3. **Investors Change Asset Allocation Strategies:** Long-term capital such as social security funds and insurance funds set "minimum ESG investment ratios"; individual investors indirectly promote capital flow to green industry sectors by allocating ESG wealth management products.

4.2 Policy Promotion of the Development of the ESG Investment Market

Policy directly promotes the growth of the ESG investment market scale by incentivizing product innovation and expanding capital supply, providing financial support for green finance.

4.2.1 Policy incentives for ESG investment product innovation

1. **Fiscal and Tax Policy Support:** Implementing tax incentives (e.g., VAT exemption on management fees) for products such as ESG-themed funds and ESG-linked bonds and providing financial subsidies for innovative product issuance (e.g., rewards of 1%-2% of the raised amount). For example, Guangdong Province provides up to 5 million CNY in establishment subsidies for qualified ESG private equity funds.

2. **Regulatory Sandbox Trials:** Allowing ESG innovative products to conduct pilot projects within a regulatory sandbox, appropriately relaxing investment scope restrictions. For example, the "ESG performance-linked bond" piloted in Shanghai allows issuers to adjust coupon rates on the basis of ESG goal achievement, enhancing product market appeal.

3. **Standardization Construction and Regulation:** Issuing *ESG Investment Product Management Standards* to clarify product naming rules, investment scope, and other requirements, preventing "greenwashing" behavior. For example, we stipulate that ESG-themed funds must invest over 80% of their noncash assets in enterprises with excellent ESG ratings.

4.2.2 Policy Promotion of the Expansion of the ESG Investment Market Scale

From the perspective of policy guiding capital inflows, relaxing investment restrictions has built smooth channels for social capital to enter the ESG investment field and strongly promoted market scale expansion. In the past, some investment fields had many thresholds and strict regulations for social capital in terms of market access, investment proportion, and fund usage scope, which somewhat restrained the enthusiasm of social capital to participate in ESG investment. Policy has relaxed these restrictions by allowing long-term funds such as insurance finance and pensions to be allocated more flexibly to ESG-related projects and expanding the investment scope of qualified foreign institutional investors (QFIIs) in the ESG investment field. This gives social capital broader investment space. Driven by profit-seeking motives and the need for diversified asset allocation, social capital is more willing to invest in the ESG investment market after

restrictions are relaxed, as it can not only obtain potential investment returns but also conform to social development trends and enhance its own social image.

4.3 Policy Improves the Support Mechanism of ESG Investment for Green Finance

4.3.1 Promotion of the construction of ESG information disclosure and rating systems

The core of policy promoting ESG information disclosure is to establish clear standards and norms, requiring enterprises to disclose environmental, social, and governance-related information comprehensively, accurately, and in a timely manner. This includes specific content such as pollutant emission data, energy consumption, employee rights protection measures, and corporate governance structure, along with specified disclosure frequency and channels. This provides a basis for measuring and comparing corporate ESG performance and allows investors to understand corporate situations more clearly. With respect to the support and supervision of ESG rating agencies, policy encourages and supports the development of professional ESG rating agencies through funding support and platform building to enhance their rating capabilities and professionalism. It also establishes sound regulatory systems to standardize the behavior of rating agencies, preventing issues such as benefit conveyance and false ratings during the rating process. For example, strictly audit the qualifications of rating agencies and require them to disclose rating methodologies and processes for public supervision. These policy measures significantly ensure the accuracy of information in the green financial market: a sound ESG information disclosure system allows market participants to obtain true and comprehensive corporate ESG information, reducing information asymmetry. A standardized ESG rating system provides investors with objective and reliable rating results, helping them make wiser investment decisions. This helps direct funds in the green financial market more accurately to enterprises and projects with excellent ESG performance, improves the operational efficiency of the green financial market, and promotes the healthy development of green finance.

4.3.2 Guiding the Coordinated Development of ESG Investment and Green Financial Products

Policies promote the coordinated development of ESG investment and green financial products such as green credit and bonds in various ways. In the field of green credit, policy guides financial institutions such as banks to incorporate corporate ESG performance into the credit approval process. It provides more favorable loan interest rates and higher credit lines for enterprises with good ESG performance while restricting credit extension to those with poor performance. This closely integrates ESG investment concepts with the green credit business, promoting more capital flow through green credit to enterprises meeting ESG requirements. In the field of green bonds, policy encourages enterprises to issue green bonds and requires issuers to disclose the correlation between fund use and ESG goals. It also guides institutional investors such as ESG investment funds to actively invest in green bonds to expand market demand, for instance, by providing policy support such as tax incentives for ESG investment funds that invest in green bonds, enhancing their investment enthusiasm. This coordinated development model improves the efficiency of the use of green finance in the real economy. ESG investment provides clear investment directions and screening criteria for green financial products, ensuring that raised funds are truly used for environmental protection, social responsibility, and other fields. Green financial products, in turn, provide diversified investment channels and tools for ESG investment, allowing them to participate more conveniently in the real economy. The synergistic effect of the two enables green financial resources to be allocated more efficiently to enterprises and projects with good ESG performance and green development potential, promoting the real economy toward green and sustainable development and enhancing the targeting and effectiveness of green finance in serving the real economy.

5. Evidence Analysis Based on Typical Cases

5.1 Financial Institution Case: Industrial and Commercial Bank of China (ICBC)

5.1.1 Institutional ESG investment practices

ICBC deeply integrates ESG investment concepts into its overall development strategy, considering environmental, social, and governance factors as key dimensions in investment decisions. It comprehensively employs strategies such as ESG integration, positive screening, and negative screening.

1. At the ESG integration level, the ICBC systematically incorporates ESG factors into financial analysis, assessing their potential impact on corporate finances to support investment decisions.

2. In positive screening, it uses weighted analysis to select projects, companies, or industries with the best ESG performance within corresponding categories or ratings for investment.

3. Negative screening involves excluding industries and companies that do not meet requirements, such as those with high pollution and high energy consumption, on the basis of specific ESG criteria.

In terms of product innovation, ICBC actively develops various ESG-related financial products. For example, in 2023, it issued the BCE 2023 Phase I Green Credit Asset-backed Securities" with a scale of 5 billion CNY, where the underlying assets were all loans for new energy projects [18]. This product combines green credit with asset securitization, enhancing the liquidity of green credit assets while providing investors with new ESG investment options. Additionally, it has issued several ESG-themed wealth management products to meet the needs of different investors.

5.1.2 Contribution to Green Finance Development

ICBC ESG investment practices have played a significant role in driving the development of green financial products. Its innovative products, such as green credit asset-backed securities, provide diversified investment tools for the green financial market, attracting more capital into green industries and enriching the green financial product market. As a large financial institution, the operational norms and evaluation standards formed during the ICBC's ESG investment process serve as a reference for other institutions in the industry, promoting the improvement of relevant standards in the green finance field. Leveraging its enormous asset scale and extensive customer base, ICBC's ESG investment behavior has a strong demonstration effect on the market and is capable of guiding more financial institutions to participate in the green finance business and enhancing the overall activity and influence of the green financial market.

5.2 Enterprise case: Contemporary Amperex Technology Co. Limited (CATL)

5.2.1 Corporate ESG Practices and Effectiveness

In environmental management, CATL has set clear carbon neutrality goals, reducing carbon emissions in the production process by optimizing production techniques. It also vigorously promotes new energy vehicle products to replace traditional fuel vehicles, reducing carbon emissions in the transportation sector. Furthermore, a comprehensive waste recycling system has been established to recycle production waste and improve resource utilization efficiency. In terms of social responsibility, CATL emphasizes employee rights protection, providing reasonable remuneration, a good working environment, and abundant career development opportunities. A comprehensive training system has been established to help employees improve their skills. In supply chain responsibility, it strictly screens suppliers to ensure that they adhere to fair and legal operating principles and protects workers' rights. It also actively participates in community public welfare activities to support community development and enhance its social reputation. At the governance level, CATL has a well-structured board with a certain number of independent directors to provide objective opinions for company decisions. It emphasizes information disclosure transparency, timely, accurate, and complete disclosure of financial status, strategic plans, and ESG-related information. Through a series of ESG practices, the sustainable development capabilities of CATL have increased. Financial data show that its market share continues to expand, profitability continues to increase, and brand value has significantly improved.

5.2.2 Impact on the Green Financial Market

The excellent ESG performance of CATL makes it easier to attract green financing. Many banks regard it as a premium customer and provide preferential interest rates on green credit to support its production scale expansion and technological R&D. In the green bond market, the green bonds issued by CATL are highly sought after by investors, and the raised funds are successfully used for new energy vehicle-related green projects. CATL's success also promotes the matching of capital supply and demand in the green financial market. Many investors, given the potential of the new energy vehicle industry and CATL's development, invest in companies similar to CATL with good ESG performance. This process promotes the effective allocation of funds in the green financial market and drives its healthy development.

5.3 Regional case: Guangdong Province

5.3.1 Regional Policy Promotion Measures

Guangdong Province has introduced a series of policies with local characteristics to promote ESG investment and green finance development. This includes establishing a large-scale provincial green industry guidance fund focused on investing in green technology R&D and the new energy industry within the province. In terms of policy incentives, Guangdong Province provides up to 5 million CNY in establishment subsidies for qualified ESG private equity funds to guide their investment in green technology fields. It also uses fiscal subsidies and tax incentives to encourage financial institutions to develop green finance businesses and support enterprises in conducting ESG practices. Additionally, it actively promotes the construction of ESG information disclosure and rating systems, requiring enterprises within the province to disclose ESG information according to regulations and cultivating professional ESG rating agencies.

5.3.2 Regional development effectiveness and experience reference

After policy implementation, the scale of ESG investment in Guangdong Province continued to expand, attracting significant social capital to green industry investment. The activity level of the green financial market has significantly improved, and the scale of green financial products such as green credit and green bonds continues to grow, providing strong financial support for green industry development within the province. The experience of Guangdong Province shows that establishing green industry guidance funds and providing policy incentives can effectively guide social capital toward ESG investment and green finance. Simultaneously, focusing on the construction of ESG information disclosure and rating systems can reduce market information asymmetry and improve the operational efficiency of the green financial market. These experiences provide a beneficial reference for other regions to promote ESG investment and green finance development. Other regions can formulate corresponding policy measures on the basis of their actual conditions to promote local green finance development.

6. Conclusion

This paper, from the core perspective of policy leadership, systematically reveals the driving path of ESG investment in green finance development through theoretical analysis, case evidence, and mechanism discussion. The main conclusions are as follows: Policy plays a key role in the role of ESG investment in driving green finance development. Against the backdrop of global climate change and the dual carbon goals, policy has become the core link connecting ESG investment and green finance through clear guidance, providing incentives, and improving mechanisms. Policy tools such as fiscal subsidies, tax incentives, and regulatory constraints at the national and local levels not only guide the dissemination of ESG investment concepts among financial institutions, enterprises, and investors but also directly promote the expansion of the ESG investment market scale and product innovation, providing financial and institutional support for green finance development.

ESG investment drives green finance development through three core paths: first, the concept dissemination path, where policy promotes the integration of ESG concepts into the decision-making logic of financial institutions, corporate operation strategies, and investor asset allocation through document regulations, industry training, and social publicity, guiding market entities toward green transformation; second, the market development path, where policy incentivizes the innovation of ESG investment products such as performance-linked bonds and thematic funds and relaxes capital access, expanding the scale of the ESG investment market to provide diversified funding sources for green finance; and third, the support mechanism path, where policy promotes the standardization of ESG information disclosure and the normalization of rating systems, fostering the coordinated development of ESG investment and green financial products such as green credit and bonds to increase the efficiency of green financial resource allocation.

Typical cases are used to verify the practical effectiveness of the driving paths. ICBC's ESG investment practices, such as green credit securitization, enrich the green financial product system. CATL improves the accessibility of green financing through ESG optimization. Guangdong Province has activated the regional green financial market through local policies such as fund subsidies and information disclosure requirements. These three types of cases, from the institutional, enterprise, and regional levels, confirm the driving effect of policy-led ESG investment on green finance, indicating that the relevant paths are replicable and promotable.

In summary, policy-led ESG investment is an important engine for green finance development. In the future, it is necessary to further improve the combination of policy tools and strengthen the synergy of market entities to continuously increase the effectiveness of ESG investment in green finance.

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