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Driving Factors for the Improvement of Corporate ESG Performance under the "Dual Carbon" Goal

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Abstract. With the development of the world economy and the severe situation of environmental pollution, the concept of corporate responsibility has shifted from traditional economic growth to a comprehensive perspective of Environmental, Social, and Governance (ESG). Under China's "high-quality development" and "dual carbon" strategies, corporate ESG performance has increasingly become an important evaluation indicator to measure a company's sustainable development capacity and long-term investment value. This paper analyzes the internal and external driving factors for the improvement of corporate ESG performance. External driving factors include policies, industry norm constraints, external attention, and industrial chains, while internal driving factors include the company's own scale, technological innovation, talent support, and executive characteristics.

Keywords: Corporate ESG Performance, Sustainable Development, Driving Factors

1. Introduction

With the emergence of global climate change, social equity, and corporate governance issues, enterprises' performance in Environmental (E), Social (S), and Governance (G) aspects has attracted increasing attention from stakeholders. ESG has evolved from an emerging concept to an important part of corporate value creation and risk management. Under the background of high-quality development and "dual carbon" development, how to enhance the sustainable development of corporate ESG is a common problem in theory and practice. Therefore, this paper aims to analyze the factors affecting the improvement of corporate ESG performance, and identify and clarify the internal and external driving factors for the improvement of corporate ESG performance.

2. Overview of corporate ESG performance

The "dual carbon" goal, collectively referring to carbon peaking and carbon neutrality, is a major strategic deployment proposed by China based on the concept of sustainable development. Corporate ESG performance is the comprehensive practical achievement and capability reflection of enterprises in three dimensions: environment, society, and governance. The environmental dimension focuses on enterprises' green practices such as carbon emission reduction, energy conservation and consumption reduction, pollution prevention and control, and resource recycling; the social dimension emphasizes enterprises' fulfillment of social responsibilities such as employee

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rights protection, customer value creation, and community public welfare participation; the governance dimension focuses on the institutional construction of enterprises such as governance structure, ESG information disclosure, and risk management and control systems. Under the "dual carbon" background, low-carbon transformation in the environmental dimension has become one of the core indicators of corporate ESG performance. The three dimensions support each other and are organically unified, jointly forming the core capability of corporate sustainable development.

The "dual carbon" goal has clarified the strategic orientation of enterprises' green transformation, prompting enterprises to integrate the concept of low-carbon development into the entire process of ESG practice. As the core implementation subject, the systematic improvement of enterprises' ESG performance is an important path and core support for achieving the "dual carbon" goal.

3. External driving factors for the improvement of corporate ESG performance

The improvement of corporate ESG performance is affected by the external macro environment, mainly including four driving factors: policy subsidy incentives, industry norm constraints, external attention, and industrial chain collaboration.

3.1. Policy subsidy incentives

Government policies in finance, taxation [1], land, and finance are important external drivers for enterprises to improve ESG performance [2]. Policy subsidies provide enterprises with "targeted support" and "clear direction", promoting the improvement of enterprises' environmental performance and social responsibility.

In the environmental dimension, policy subsidies can provide financial support for green innovation in various forms, reduce enterprises' environmental governance costs, support enterprises' green investment, and promote enterprises' green transformation. For example, fiscal incentives, tax reductions and fee reductions are important policy tools to encourage enterprises' technological innovation. Green subsidies and the value-added tax (VAT) refund policy for retained credits on environmental protection equipment investment directly reduce the financial burden of enterprises' energy-saving equipment investment, lower the cost of R&D input, and encourage enterprises to make large-scale green investments (such as photovoltaic and LED lighting equipment). "Linking green financing quotas with ESG budgets" can guide enterprises to prioritize funds for low-carbon technological transformation and circular economy practices, thereby achieving the goals of pollution reduction and energy efficiency improvement. R&D innovation subsidies and the policy of additional deduction of R&D expenses aim to stimulate green technological innovation, encourage enterprises to innovate by increasing the marginal return of R&D output, promote enterprises to make breakthroughs in energy-saving process R&D, environmental protection material innovation, etc., and affect enterprises' environmental performance.

In the social dimension, to reduce social dissatisfaction with their "inaction" and comply with the principle of equality between rights and responsibilities, enterprises that receive government subsidies often gain support from both the government and enterprises through charitable donations and other good deeds, thereby diverting social attention, alleviating public opinion pressure, and promoting enterprises to fulfill social responsibilities. For example, the government's support for national or provincial major R&D plans and technological innovation projects reduces the cost of enterprises' R&D failure, encouraging enterprises to continuously develop safer, more efficient, and more inclusive products. These products themselves have technological advancement and public

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accessibility, thus becoming a direct manifestation of enterprises' fulfillment of social responsibilities, achieving the symbiosis of social value and commercial value.

3.2. Industry norm constraints

Industry norm constraints effectively promote the standardization of corporate ESG governance systems and strengthen the ESG collaboration function of enterprises and their supply chains through two aspects: "mandatory disclosure + standardized guidance".

On the one hand, industry norms clarify the main indicators of ESG information disclosure through a unified content framework for disclosure, avoiding selective disclosure by enterprises. For example, ESG information disclosure in a certain industry may require enterprises to mandatorily disclose corresponding environmental indicators (such as medical waste disposal volume) or social indicators to ensure the completeness and comparability of information disclosure. In addition, industry norms specify the time nodes, report forms, and disclosure channels for information disclosure. Enterprises can release ESG reports reviewed by third-party agencies through designated platforms, incorporating disclosure responsibilities into the scope of corporate compliance management. Enterprises' environmental data need to be tested by qualified testing institutions, which is conducive to promoting enterprises to establish a normalized data collection and management mechanism and enhance the accuracy and credibility of disclosed information.

On the other hand, industry norms clarify quantitative compliance bottom lines and define the boundaries of environmental behavior. By formulating unified quantitative indicators such as pollutant emission limits, energy consumption intensity standards, and green production process requirements, they replace vague "compliance requirements" and provide implementable standards for enterprises' environmental compliance. For example, it is clarified that high-energy-consuming enterprises must use clean production processes, promoting enterprises to shift from "meeting standards is sufficient" to "benchmarking advanced standards". Some regions will formulate hierarchical and classified ESG systems, such as clarifying full coverage of ESG disclosure for specific types of enterprises or listed companies, and planning to formulate ESG-related standard guidelines covering core areas such as greenhouse gas accounting and waste recycling, while introducing a third-party certification mechanism to strengthen the reliability of information disclosure. These systems not only promote enterprises to establish standardized ESG governance structures but also promote the extension of ESG requirements to their supply chains, solving the problem of weak ESG capabilities of small and medium-sized enterprises through a "strong leading weak" responsibility community model and promoting ESG collaboration across the entire industrial chain.

3.3. External attention

External attention is an important external driving force for the improvement of corporate ESG performance, mainly involving three types of subjects: investors, analysts, and the media. It can adjust the allocation of government attention, improve enterprises' awareness of sustainable development, and thereby help improve corporate ESG performance [3]. As core participants in the capital market, investors' attention forms rigid constraints through capital allocation. ESG performance has become a core investment evaluation indicator: enterprises with high ratings are more likely to obtain ESG fund allocation and green financing dividends, while enterprises with low performance face the risk of capital withdrawal. This orientation guides enterprises to attach importance to ESG management to ensure financing channels. As professional information

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intermediaries, analysts play a transmission role. By in-depth mining of ESG data and conducting professional financial and business analysis, they not only improve information transparency and resolve market information asymmetry but also amplify supervision signals through the dissemination of research reports, triggering media and public attention. At the same time, they set improvement benchmarks for enterprises with industry benchmarking reports, alleviating financing constraints to support ESG investment. The media constructs social reputation constraints relying on extensive communication power: positive reports can enhance enterprises' brand credibility and market recognition, while negative exposures can trigger trust crises and market value fluctuations. In particular, reports from professional media such as securities firm official WeChat accounts are both professional and communicative, forcing enterprises to strengthen self-restraint by amplifying public pressure. At the same time, reports focusing on ESG hot issues may promote the improvement of regulatory policies, forming a synergistic catalytic effect between policies and social supervision.

3.4. Industrial chain collaboration

Through cross-organizational resource integration and standard unification, the industrial chain promotes the upgrading of environmental performance from "single-enterprise emission reduction" to "full-chain low-carbon transformation". Enterprises can formulate special internal policies for suppliers, establish green supplier standards, and integrate sustainable procurement activities into the whole-life cycle management of suppliers, driving upstream and downstream supporting enterprises to unify environmental protection processes, thereby reducing environmental risks across the entire industrial chain. The close matching and efficient logistics system between upstream and downstream of the industrial chain shorten the physical transportation distance, which is not only conducive to enterprises reducing carbon emissions but also to the overall carbon emissions of the supply chain. In addition, through collaborative planning, enterprises can realize cross-enterprise waste reuse and graded energy utilization, building a regional circular economy closed loop.

At the same time, industrial chain collaboration can embed regulatory compliance requirements into every link from raw material procurement and core component manufacturing to product assembly and commissioning, enabling corporate governance to transition from passive defense to active integration. Upstream suppliers should strictly follow the quality management, sustainable procurement and other norms of core manufacturers during collaborative design. Downstream distributors also need to receive strict training to ensure the standardization of clinical use and the timeliness of feedback data. On the other hand, enterprises' cooperation, competition, and intellectual property transactions require enterprises to have transparent and standardized internal control and decision-making mechanisms to cope with complex competitive-cooperative relationships and contract performance requirements. In enterprise cooperation, enterprises with high governance levels and standardized management can effectively transmit their governance structures and management systems, forming a "strong leading weak" responsibility community and improving the overall resilience and moral level of the supply chain.

4. Internal driving factors for the improvement of corporate ESG performance

Enterprises' own resource endowments, strategic choices, and capability building are the endogenous driving forces for their sustainable development. The ability to effectively respond to the external environment ultimately depends on the soundness of enterprises' internal driving

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mechanisms. This paper holds that the internal driving factors mainly come from four aspects: the company's own scale, technological innovation, talent support, and executive characteristics.

4.1. Corporate scale

Corporate scale is a key factor driving the improvement of ESG performance, with the core logic centered on the dual mechanisms of resource support and reputation pressure [4]. In terms of resource support, larger enterprises have more resources, higher visibility, and disclose more information. Such enterprises often layout diversified industries, with strong operational stability and high capital allocation efficiency. They not only have the ability to invest in long-term projects such as green technology R&D and environmental protection facility construction but also are more familiar with professional management tools such as environmental management systems and sustainability balanced scorecards. Sufficient idle resources allow large enterprises to avoid compromising between short-term interests and sustainable development and are more inclined to take the initiative to promote ESG construction. In addition, complementing the direct external attention pressure from investors, the media, etc., enterprises' internal demand to maintain their intangible assets makes them more forward-looking and proactive in ESG practice. The higher an enterprise's market influence and reputation value, the broader the group of stakeholders it faces, and the stronger the public supervision pressure it must bear. As a scarce resource, reputation is directly related to an enterprise's competitive position, and ESG performance is an important carrier for maintaining brand credibility. At the same time, due to the more prominent information asymmetry between management and shareholders in large enterprises, the agency cost is relatively high. By improving ESG information disclosure and practice, enterprises can not only send signals of compliant operations to the market, demonstrate their identity as good corporate citizens but also effectively reduce agency risks. This dual drive of resources and supervision makes larger enterprises more proactive and advantageous in ESG performance.

4.2. Technological innovation

Corporate technological innovation is the core endogenous driving force for the improvement of ESG performance. Relying on enterprises' own technological advantages, R&D systems, and their cooperation capabilities with external scientific research institutions, enterprises can integrate internal and external resources, share energy-saving technologies, and jointly tackle technical problems, providing solid technical support and efficiency guarantees for their sustainable development [5].

On the one hand, technological innovation can lower the threshold for enterprises' green technology R&D. The R&D of high-end products or complex technologies requires multidisciplinary knowledge and capital investment. Through cooperation with scientific research institutions or shared platforms, enterprises can obtain innovative technical support and shared green and low-carbon technology R&D resources. Without independently bearing the high cost of basic research, enterprises can access cutting-edge applied technologies in energy conservation and emission reduction, clean production, and circular economy, avoiding the duplicate investment in R&D infrastructure and resource waste, improving resource utilization efficiency, and accelerating the diffusion of green innovation.

In addition, technological innovation is conducive for enterprises to provide innovative and inclusive products, improve the accessibility and effectiveness of services or products, meet the development of social needs, and enhance enterprises' ability to create social value. On the other

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hand, technological innovation also helps enterprises improve their governance level. In the process of cooperative R&D, it is necessary to establish sound intellectual property management systems, technology achievement sharing agreements, and confidentiality agreements, which to a certain extent force all parties to improve intellectual property management, improve their own governance level, and promote the governance level of the overall innovation ecosystem.

4.3. Corporate talent support

By introducing and cultivating high-quality talents, enterprises form a talent "pool", promote the agglomeration of various professional talents (including green technology talents, ESG compliance management talents, etc.), and then realize interdisciplinary communication and integration, accelerating the breakthrough of core technologies such as green technologies. At the same time, talent agglomeration also shows the positive impact of talent flow and development on corporate governance. To retain high-level talents, enterprises often provide a more improved compensation system and a fair development environment, enhance employee well-being, and protect employee rights and interests.

Second, through in-depth participation in talent training, enterprises can not only meet their own development needs but also fulfill their social responsibility of promoting regional education and employment. For example, enterprises can carry out industry-university-research cooperation through internal training, joint training and exchange with universities, scientific research institutions, etc. Internal training and external cooperation can enrich employees' professional knowledge, cultivate more industry talents, and expand the boundary of social value coverage. Through value transformation, the ESG concepts of aggregated talents are more highly integrated with enterprise operations. For example, environmental protection talents guide green technological innovation to improve production processes and reduce energy consumption; compliance talents improve the ESG governance system; technical talents develop inclusive products and expand the boundary of social value coverage. The internal ESG committee of enterprises is generally composed of aggregated technical experts, compliance consultants, clinical experts, etc., ensuring the scientificity and implementability of ESG decisions.

4.4. Executive characteristics

Executive characteristics such as gender, educational background, and top management team attributes all affect corporate ESG performance. In terms of gender, the proportion of women holding board and senior management positions is positively correlated with corporate ESG performance. Compared with men, women have a stronger sense of environmental protection, are more sensitive to risks, and their risk-averse tendency makes them pay more attention to the long-term value of sustainable development. They tend to formulate strict ESG-related systems such as environmental protection standards and safe production norms. Therefore, female executives are more suitable to participate in strategic decisions related to environmental and social responsibilities [6], improving the scores of these two sub-items and enhancing ESG performance. In terms of educational background, executives' educational backgrounds such as overseas and academic backgrounds can affect corporate ESG performance through knowledge transfer, resource connection, and conceptual innovation [7]. Returnee executives usually pay more attention to corporate ESG strategies and are familiar with international ESG disclosure rules. They can integrate international sustainable development concepts into corporate strategies by virtue of their own advantages, promoting environmental protection, social responsibility fulfillment, and

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corporate governance optimization. In addition, based on the upper echelons theory, executives' academic experience can promote enterprises' green technological innovation, improving environmental performance through product environmental protection upgrades and efficient energy utilization; academic executives attach more importance to personal reputation and social evaluation, avoiding corporate reputation crises by actively fulfilling ESG responsibilities, and enhancing corporate social image and brand value through ESG performance. The stability and quality of the top management team help reduce managers' myopic behavior, thereby promoting enterprises to better fulfill ESG responsibilities.

5. Conclusions and implications

5.1. Main conclusions

Policy subsidy incentives are the fundamental driving force of external drivers. Government resource subsidies and clear direction guidance in finance, taxation, and other aspects have effectively reduced enterprises' green investment and R&D costs, promoting enterprises to continuously invest in the environment and social responsibilities, and improving enterprises' environmental performance and social responsibility. Industry norm constraints are an important guarantee of external drivers. Through mandatory disclosure and industry standard guidance, industry norms have unified ESG information disclosure standards, specified quantitative compliance bottom lines, promoted enterprises to establish standardized ESG governance mechanisms, extended ESG requirements to the supply chain, and improved the collaboration level between enterprises and the supply chain. External attention is the overall driving force of external drivers. Investors' capital allocation, analysts' information intermediation have improved market transparency and set improvement benchmarks, and the media's social reputation mechanism has strengthened supervision pressure. These driving forces have jointly formed a driving model of "capital constraints + information transmission and social supervision", promoting enterprises to shift from passive compliance to active optimization. Industrial chain collaboration is a systematic guarantee of external drivers. The integration and collaboration between enterprises and upstream and downstream of the industrial chain have effectively removed obstacles to single-enterprise innovation and promoted the extension of social responsibilities. Green collaboration has achieved "full-chain low-carbon transformation", and governance collaboration has embedded compliance requirements into various links, forming a "strong leading weak" responsibility community, and comprehensively improving the overall resilience and moral level of the entire chain.

Corporate scale is the premise of internal drivers. Enterprises with higher resource endowments can invest more in green technology R&D and environmental protection facility investment. At the same time, they have higher visibility, resulting in greater corporate reputation pressure and public supervision. In turn, enterprises maintain their brand image and reduce agency costs through ESG performance, making ESG practice more proactive. Technological innovation is the driving force of internal drivers. Enterprises' own technological advantages and cooperation with external scientific research institutions can bring technology sharing and joint tackling of key problems, lowering the threshold for green technology R&D, accelerating green technology integration, improving environmental performance, and expanding social value through innovative inclusive products. Corporate talent agglomeration is the core support of internal drivers. The talent "pool" within enterprises and in external cooperative ecosystems can bring interdisciplinary communication and integration, accelerating the breakthrough of key technologies; talent agglomeration and flow can promote enterprises to build compensation mechanisms, career development paths, and protect

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employee rights and interests, and fulfill social responsibilities through talent training, making ESG practice more consistent with enterprise operations. Executive characteristics are the key factors of internal drivers. Characteristics such as female executives' risk aversion, environmental awareness, advanced concepts and resources brought by executives with overseas or academic backgrounds, and the stability of the top management team can all affect corporate ESG performance. They directly affect the cognition, values, and decision-making tendencies of enterprise management, thereby affecting enterprises' strategic formulation and implementation, and further shaping ESG practice.

5.2. Implications

Enterprises should actively respond to policies and seize policy dividends. They should pay close attention to the government's relevant support policies, apply ESG concepts to enterprise development, strive for policy support, and reduce green transformation costs. Enterprises should take the initiative to improve disclosure quality in accordance with industry norms. They should strictly comply with industry ESG disclosure requirements, improve data collection and management systems, enhance the transparency and credibility of ESG reports, and meet the increasingly strict regulatory requirements and market expectations. Enterprises should give full play to their technological advantages, strengthen technical cooperation, share R&D resources, actively cooperate with universities and scientific research institutions to carry out green technological innovation and the development of inclusive products, attach importance to talent introduction, cultivation, and retention, and build a high-quality ESG team; formulate competitive salary and welfare and career development plans, introduce and cultivate professional talents related to green technology and ESG management, and cultivate more industry talents through industry-university-research integration [8]. Enterprises should strengthen collaboration with upstream and downstream of the industrial chain and build a sustainable supply chain. They should introduce ESG requirements into the supplier management system, promote green transformation and governance optimization of the entire industrial chain, and drive the improvement of the overall ESG level through collaboration.

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