DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.132-150
JEL classification: G11, G30, G31, G32

ESG Transformation in the Largest Emerging Capital Market of China. A Literature Review

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Abstract

The paper provides a scholarly examination of academic studies of the ESG landscape in China through a systematic literature review with a major focus on the nature and intensity of regulatory guidelines and policies. While many studies indicate positive effects of Chinese ESG policies on corporate ESG performance and investment, they primarily focus on environmental aspects. This analysis of China's ESG rating system exposes relationships between ESG ratings, corporate performance, financing costs, including both debt and equity financing. The research on equity financing costs is inconsistent and limited in scope, indicating the need for additional investigation. Of the factors influencing ESG, the past year has seen a surge in research on the topic of digital transformation and ESG performance. Most studies demonstrate that digital transformation contributes to ESG performance, and a few suggest that digital transformation positively moderates the effect of ESG performance on firm value enhancement. This review discusses the growth of ESG investment in China, focusing on pension funds, commercial banks, and ESG funds, as well as investor preferences. Despite the growing role of ESG in investment decisions, extant research is largely theoretical, underscoring the need for more empirical and quantitative studies. The research identifies gaps in studies devoted to ESG investment, including the need for comprehensive studies on the impact of ESG across various insurance types and industries, and the development of effective ESG quality assessment methods. This review is among the first academic resources summarizing and integrating various studies, and highlighting areas for future ESG research in China.

Keywords: ESG Development, Policy response, ESG Ratings, Digital Finance, Digital Transformation, ESG Investment, Corporate Performance, Financing Costs, China

For citation: Wu Y. (2023) ESG Transformation in the Largest Emerging Capital Market of China. A Literature Review. *Journal of Corporate Finance Research.* 17(4): 132-150. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.132-150

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Introduction

Environmental, Social, and Governance (ESG) considerations have become an integral part of the global capital markets, affecting corporate conduct, investment decisions, and government regulations. While substantial advancements have been made in developed markets, China, as the world's largest emerging market, presents a more nuanced and less systematically studied landscape.

China has seen a proliferation of ESG-related research, but a comprehensive understanding remains elusive [1]. There's a deficit of mandatory ESG policy regulation and research of the effects of specific ESG policies on ESG performance and investment. While numerous studies have explored the impact of ESG ratings on financial outcomes, such as financing costs, there is still disagreement about the relationship between ESG and financing. Moreover, the scope of research on the cost of equity financing is narrow, thereby necessitating further exploration. Amid the rapid development of the digital economy, there has been a surge in academic articles on digital transformation and ESG performance across various fields of interest in the past two years. However, there hasn't been any systematic research reviewing the academic landscape of this sector. Studies on ESG investment are relatively scarce, and many remain at the theoretical level, lacking empirical and quantitative analysis. While research has primarily focused on the intersection of ESG with pension funds, insurance, and commercial banks' ESG investment strategies, there is a relative dearth of research on ESG funds, ESG bonds, ESG credits, and equity. Existing studies often do not fully address how these ESG implementations interact with China's unique economic, cultural, and regulatory contexts.

In light of this, our study attempts to systematically analyze the literature, summarizing the methods, data, and conclusions currently used in research, exploring the differences in various related topics, and identifying gaps in the research. This is done with the aim of identifying which topics are worth scholars' efforts.

Therefore, this study aims to identify the areas of focus for researchers in order to clarify this dispersed field and further advance the scientific knowledge on the topic by outlining future research directions.

To achieve this objective, our study seeks to address the following research questions:

RQ1: What are the main topics of debate in the literature on ESG transformation in China's emerging capital markets?

RQ2: What are the main points drawn from the research?

RQ3: What are the differences in the research methods and conclusions across these topics?

RQ4: What are the research prospects for these topics?

After systematically studying the topics discussed in the literature, the authors focused their research attention on the most discussed topics [2]. Upon determining the topics most suitable for the research purpose and methods, we identified important themes related to ESG transformation in China's emerging capital markets (RQ1), methodically summarized the main points drawn from each topic (RQ2), and compared the differences in the methods and conclusions used in these studies (RQ3). Finally, we identified gaps in the literature to address future work in these areas (RQ4).

By synthesising research findings from different sources, this review provides a unified framework covering the development and policies of ESG in China, the impact of ESG ratings on corporate finance, the relationship between digital transformation and ESG, and ESG investment practices in China. By addressing these gaps and providing a more comprehensive view, this review serves as a robust resource for future academic research.

Methodology

The Process Used to Design the Research Framework

To answer these questions, the authors adopted the systematic literature review method proposed by D. Tranfield et al. [3]. This method is considered the most comprehensive and rigorous because it can lay the foundation for the advancement of knowledge [4].

To make the analysis replicable, we followed these steps to identify and evaluate academic contributions related to ESG performance in China, so as to accurately locate the search scope in the database, and the most scientifically relevant themes and sub-themes:

Literature Search: We conducted a search in Scopus, WanFang, and CNKI literature databases using "ESG", "Environment", "Social Responsibility", "Corporate Governance", and "China" as keywords. Each search was performed with one ESG-related keyword paired with "China".

Literature Screening: In Scopus, we applied two screening criteria: the study period from 2003–2023, and literature in English and Chinese. The search was further refined by considering the academic fields referenced in the research [5]. The academic fields selected were "Econ" and "Busi". In terms of study types, we included both theoretical and empirical studies. For literature from Chinese databases, we selected those from Peking University Core rank, CSSCI and CSTPCD (Chinese Science and Technology Papers and Citations Database) to ensure the quality of the literature.

Literature Compilation: We obtained relevant Chinese literature from WangFang and CNKI, and deleted duplicates from the article sample to be analyzed from the two different databases. We formatted these to match the files exported from Scopus and translated Chinese literature from the Chinese databases into English for clustering analysis.

Keyword Clustering Analysis: We processed the retrieved information using VOSviewer to identify keyword clusters. Clustering was determined automatically by the system.

Selection of Relevant Literature: Based on the retrieved literature, we selected the current key research topics using the Network Visualization function in VOSviewer. The selection was made based on the quality and significance of the articles. Ultimately, we summarized a total of 108 core related articles, out of these, there are 12 articles from the year 2018 and before, 24 articles from the years 2019 to 2021 inclusive, 28 articles from 2022, and 43 articles from 2023.

Critical Evaluation: We critically evaluated the identified relevant articles to determine the academic contribution of ESG performance in the Chinese market.

Analysis of Research Gaps and Future Research Directions: For each topic, we analyzed the gap in current research and suggested directions for future research.

Literature research result

Through these steps, we created a comprehensive literature review of ESG performance in China, aiming to deepen the understanding of academic contributions in this field and provide directions for future research.

Following our algorithm, we have identified the distribution of ESG-related topics shown in Figure 1.

Figure 1. Visualization of key words clusters processed and retrieved through VOSviewer

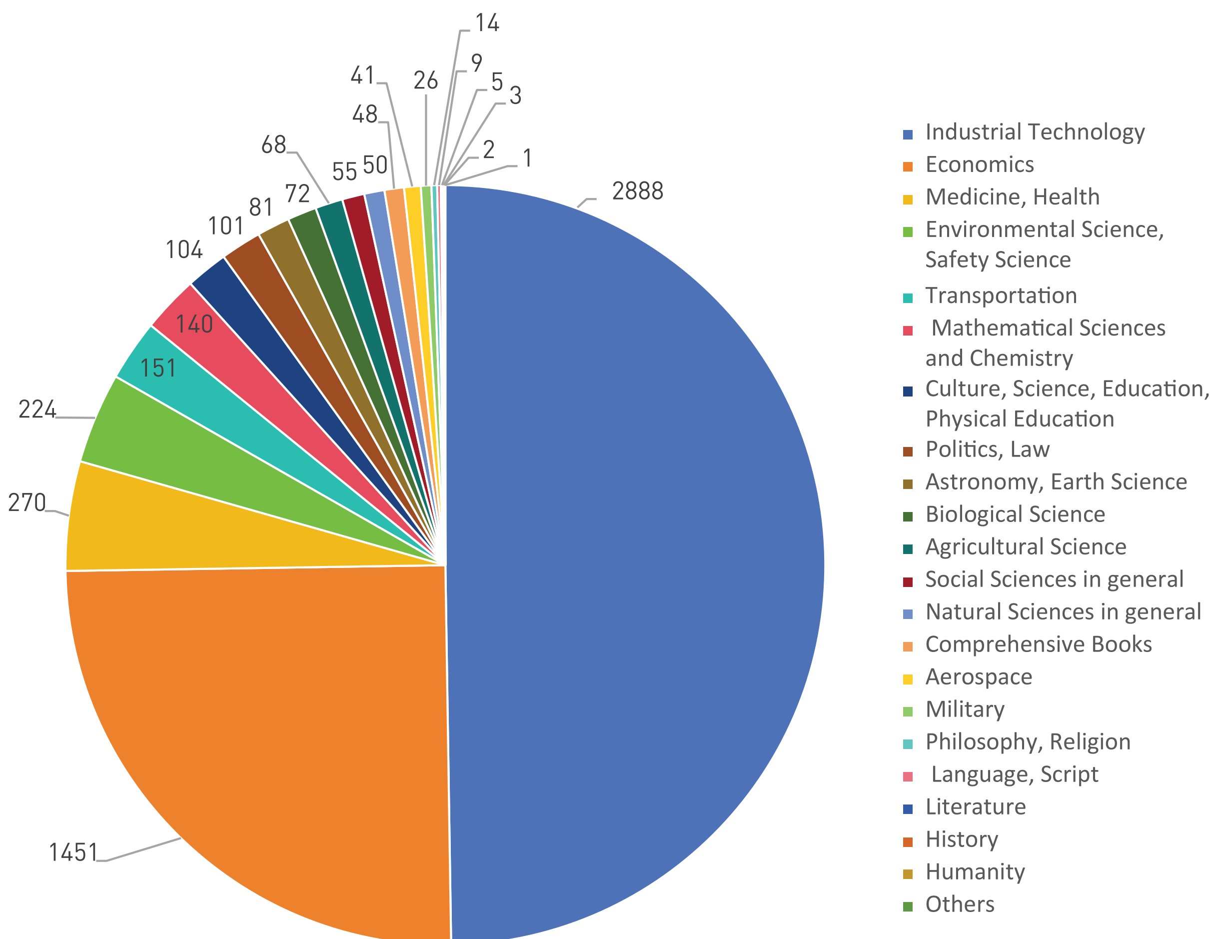
It can be seen that the most critical ESG-related topics are: ESG in China, public policy, ESG investment, green finance, pension funds, investment funds, institutional investors, ESG rating, ESG performance, corporate value, financial performance, and digital transformation. This paper will categorize these key topics and elaborate on the prevailing state of ESG thematic research. The discussion has been divided into four primary sections: "Development and Policy of ESG in China", "The impact of ESG rating on corporate finance", "Digital Transformation and ESG Performance" and "ESG Investment".

As can be seen from Figure 2, there is a clear distribution of ESG-related research across disciplines. Notably, industrial technology dominates the ESG research field, accounting for almost 50% of all ESG-related research, with economics accounting for about a quarter of the total. This dominance may highlight the prominence of ESG factors in these fields and their key role in leading ESG research.

At the same time, the fields of medicine and health (5%), environmental and safety sciences (4%), and transport (3%) also contribute to the ESG research body, albeit on a smaller scale. ESG research in these areas, although less than in industrial technology and economics, demonstrates the growing recognition of the importance of ESG issues in these disciplines.

In summary, this overview maps the distribution of ESG research across the different fields, highlighting the different focus on ESG issues across disciplines. It provides insights into how environmental, social and corporate governance factors are incorporated and studied in various fields, providing a broad perspective on the current state of environmental, social and corporate governance research.

Figure 2. Industry Distribution of ESG-related Research in China



Theoretical Background

The principal theories employed in relevant literature are information asymmetry and financing constraints. These theories provide a theoretical basis for understanding how companies can influence their financial condition by improving their ESG performance. The following analysis will address how these two theories are represented within three research themes.

Impact of ESG Ratings on Corporate Finance

Numerous studies suggest that, due to information asymmetry and financing constraint theories, the ESG performance affects corporate financing costs and corporate value [6– 10]. A. Richardson and M. Welker's [6] research shows that corporate social responsibility information disclosure can significantly reduce the level of information asymmetry, thereby reducing equity capital costs by diminishing company liquidity risk and prediction risk. M. Plumlee et al. [7] found that voluntary disclosure of environmental and social responsibility information increases a company's free cash flow, significantly reduces equity financing costs, and enhances company value. Z. Liu [8] suggests that proactive disclosure of environmental information reduces the level of information asymmetry for external investors, leading to more financing and further reducing capital costs. X. He et al. [9] concluded that the higher the quality of the company's disclosure of social responsibility information, the lower the degree of financing constraints, which aids in equity refinancing. M. Qiu, and H. Yin [10] found that companies with better environmental and corporate governance performance can effectively reduce financing costs, and the quality of ESG information disclosure has a significant impact on this relationship. These results theoretically support that ESG information disclosure can increase corporate information transparency and improve the company's information environment.

Regarding Digital Transformation and ESG

A company's digital transformation can help reduce information asymmetry, which in turn lowers financing costs and alleviates agency problems, ultimately improving the company's ESG performance [11].

Information asymmetry often increases corporate financing costs and causes agency problems, as managers may prioritize short-term goals over the company's long-term sustainability [12]. These factors can hamper ESG performance.

However, a company's digital transformation can address these issues by enhancing data processing and mining capabilities, improving the availability of information [13]. This allows markets to gain a better understanding of a company's operations [14], leading to reduced information asymmetry, lower financing costs, and improved ESG performance.

Theoretical Basis for ESG Investment

Financing Constraints Theory: In ESG investment, companies often face significant financing constraints due to the substantial investments required for conducting green transformations and fulfilling social responsibilities [15]. Investors, particularly those paying heightened attention to a company's ESG performance, can provide the necessary capital to alleviate these constraints [16; 17]. This enables companies to engage in activities that enhance their public image and demonstrate their commitment to sustainable operations.

Information Asymmetry Theory: Investor attention also plays a crucial role in reducing information asymmetry in ESG investment. As investors delve into a company's operational status and development potential, the transparency of corporate information improves [18; 19]. This reduction in information asymmetry can encourage management to pay more attention to long-term sustainable development and social responsibility, thereby enhancing the company's ESG performance [20]. Moreover, to effectively reduce information asymmetry and avoid the risk of adverse selection, companies are motivated to voluntarily disclose ESG-related information, improving the level and quality of information disclosure [21].

In summary, the theories of financing constraints and information asymmetry play a key role in ESG investment, driving companies to enhance their ESG performance and transparency.

Conclusion

In summary, the theories of information asymmetry and financing constraints provide theoretical support for understanding the impact of ESG ratings on corporate finance, how digital transformation affects ESG performance, and how investor attention impacts ESG investment. These theories offer a theoretical basis for understanding how to enhance information disclosure, reduce information asymmetry, lower financing costs, and improve a company's ESG performance.

Current status of ESG research in China

ESG development in China

In recent years, the concept of sustainable development has gradually spread globally, and the focus of the capital market on corporate social responsibility information disclosure has gradually shifted from CSR to ESG. Both ESG and CSR are frameworks for measuring a company's performance in social responsibility and sustainability. However, ESG focuses more on evaluating a company's environmental impact, social responsibility, and governance structure from an investment perspective. Its evaluation standards can be quantified and broadly applied throughout a company's entire operational process. In contrast, CSR primarily focuses on a company's voluntary actions and moral commitments, usually concentrating on specific projects or plans, and its results are often more challenging to quantify. China is currently undergoing a transformation from CSR to ESG [22].

In terms of legal implications, the shift from CSR to ESG signifies the evolution of the core concept of sustainable development, the expansion of concepts, and the strengthening of responsibilities. In terms of functional positioning, the shift from CSR to ESG demonstrates the expansion of sustainable development from risk prevention to system governance, and from promoting sustainable transition to fostering social innovation. The shift from CSR to ESG entails an evolution of the implementation model of sustainable development from unilateral regulation to multi-party co-governance. It manifests as the optimization and upgrade from problem-oriented thinking to systematic arrangements in standard configuration [23].

N. Chen, and F. Sun [24], and X. Xu et al. [1] have pointed out that even though ESG is rapidly developing in China, when compared to the ESG development status in other countries, China's progress is relatively lagging. These researchers argue that the development and research of ESG in foreign countries can provide valuable guidance for the improvement and development of the ESG system in China. This suggests that China's ESG development can benefit from observing and adopting the best practices and lessons learned from foreign countries.

Firstly, the concept of ESG has its roots in international initiatives, with its origins traced back to when the United Nations Environment Programme (UNEP) first advocated for the integration of ESG issues in investments in 2004. Subsequently, the United Nations and other international organizations began to construct ESG-related principles and frameworks, and promote the adoption of ESG disclosure standards by national exchanges, which has gradually formed a more complete ESG disclosure and performance evaluation system [24]. The development of the ESG concept was further shaped by the Principles for Responsible Investment (UN PRI), which was launched by the United Nations in 2006. This international leadership has had a profound influence on the understanding and adoption of ESG principles worldwide [25]. In China, the adoption of ESG started later, but has been largely guided by these international principles. The emphasis on "sustainable development" and "green and low carbon", central to the global ESG discourse, found resonance with China's development strategy. Since 2017, the Asset Management Association of China, drawing inspiration from international practices, initiated ESG research, extensively promoting the ESG concept. The inclusion of A-shares in the MSCI Emerging Markets Index and the MSCI Global Index in June 2018 marked a significant milestone, necessitating ESG research and rating for all the listed Chinese companies. This development, essentially a result of international influence, has spurred ESG research and policy-making in China [25]. A. Zhang, and J. Cai [26] said that the establishment and development of ESG system in China should not only absorb the international advanced experience, but also integrate with China's economic and social development,

integrate the new development concept into the ESG system, and ensure that the direction of ESG development is in line with China's high-quality development strategy. Q. Zhu [27] further emphasizes the instructive role of international practices, using the example of Japan's post-war corporate governance system development. The development of Japan's corporate governance system in the post-war period has been a process of transformation from the supremacy of stakeholder and shareholders' interest to the supremacy of ESG-embedded shareholders' interest. Q. Zhu [27] suggests that China, while learning from international practices, should adapt these to local conditions, exploring the integration of ESG responsibilities into modern corporate law theories. This indicates the ongoing influence of international ESG development on shaping China's ESG landscape.

On the other hand, Q. Zhang, and R. Sun [28], and X. Xu et al. [1], have highlighted that while the demand for ESG among Chinese investors is gradually increasing, and the willingness to invest in ESG is strong, the actual practice of ESG investment in China is still very limited. These researchers argue that the lack of ESG information channels is a significant factor hindering ESG development in China. They propose that a comprehensive ESG system should focus on improving the ESG information disclosure mechanism for enterprises and formulating information disclosure standards. This perspective underscores the need for transparency and standardization in ESG practices to drive further development.

In summary, while there is a consensus on the increasing importance and demand for ESG in China, there is divergence in the focus of the solutions proposed. One group of researchers emphasizes learning from foreign ESG practices [1; 24], while another group prioritizes the enhancement of ESG information disclosure mechanisms and standards in China [1; 28]. This reflects the multifaceted nature of the challenge presented by ESG development in China, suggesting that a combination of these approaches may be required to effectively advance ESG practices.

ESG guidelines and Policies issued by regulatory authorities and exchanges

The development of ESG policies and regulations in China is a topic of considerable interest among researchers, with differing perspectives and findings.

On the policy front, Y. Gao, and L. Li [29] have conducted a detailed analysis of ESG policies and regulations in developed economies such as the EU, the US, Japan, and Hong Kong. They have also categorized all ESG-related policies in China into two types: top-level ESG-related policies and ESG information disclosure-related policies. Meanwhile, J. Xie [30] found that most ESG-related policies are guiding in nature, with the vast majority being encouraging and voluntary. In terms of the strength of ESG policy regulation in China, J. Xie [30] and A. Xie, H. Routh, and L. Gu [31] both highlight the lack of mandatory ESG report disclosures for Chinese funds. This suggests an opportunity for stronger regulatory oversight in this area.

As for the impact of ESG-related policies on ESG performance and investments, X. Chen, and M. Zhang [32] have found that green policies and the implementation of green finance policy, respectively, have a positive impact on ESG investments and corporate ESG performance. While both studies affirm the effectiveness of green policies in influencing ESG investments, they differ in their focus, methodology, and specific findings. M. Zhang concentrate on investment returns, while Chen focuses on corporate ESG performance and use a traditional empirical approach, contrasting with Chen's use of the DID model.

Conversely, H. Shu, and W. Tan [33] argue that carbon control policy risks can negatively impact corporate ESG performance. H. Cai, and Z. Zhou [34] also pointed out that market carbon emission trading policies can enhance the quality of ESG information disclosure, with government environmental subsidies playing an intermediary role in this process. This finding underscores the potential of policy interventions in improving ESG practices and the synergistic interaction between market mechanisms and government support.

However, Q. Chen, and Z. Liu [35] add another dimension by studying the effects of economic policy uncertainty, showing that increased uncertainty can significantly enhance the ESG performance of listed companies, particularly those with high media attention and state-owned enterprises.

In summary, while there is a consensus on the need for more comprehensive ESG policies and regulations in China, opinions diverge in the perceived impact and effectiveness of existing policies. These differing perspectives underscore the complexity of ESG policy development and implementation in China, suggesting that a multifaceted approach that takes into account China's unique national conditions may be most effective.

Conclusion

The literature reveals several gaps in our understanding of ESG development and policy regulation in China. For instance, there is a lack of mandatory regulation, with most policies being voluntary and encouraging. Furthermore, our findings indicate that the majority of policy and research attention is primarily directed towards the environmental and governance facets, with the "social" component often receiving less consideration. Additionally, most studies on the impact of Chinese ESG policies on corporate ESG performance and ESG investment show positive effects, but these studies are largely based on "environmental" and related policies. There is a dearth of research examining the impact of policies in the "social" and "governance" dimensions on ESG performance and investment. Also, there are no studies on ESG policies on corporate performance, and few case studies on the specific impact of specific policies on corporate ESG disclosure, with most policy studies remaining at the macro level of analysis.

The impact of ESG rating on Corporate Finance

Relationship between ESG rating and corporate performance

Most studies show that ESG ratings are positively related to corporate performance [36]. Including a positive effect on corporate stock returns [36]; G. An et al. [37] studied the effects of ESG composite score, environmental responsibility score, social responsibility score, and corporate governance score on earnings per share, respectively, and found that the ESG rating system had different degrees of positive effects on listed companies in different industries. H. Hu [38] also indicated that the improvement of ESG rating has a significant positive effect on the cumulative excess return of listed companies' stock.

In addition, in studies of firm classification, the effect of ESG performance on firm value is more pronounced for non-state enterprises, smaller firms, and firms in non-polluting industries [36]. The implementation of ESG investment concept is conducive to guiding financial institutions to invest capital in green industries, enhancing their green investment capacity, and fostering the sustainable development of green finance self-growth [39].

There are also a few studies that show that ESG ratings are negatively related to firm performance. A. S. Garcia et al. [40] study of BRICS companies shows that the profitability of corporate assets is only related to environmental indicators and the negative sign of the association between the two suggests that the best ESG performing companies tend to be less profitable. Few currently show a negative correlation about ESG ratings.

The impact of ESG factors on the performance of firms varies across industries. According to a study of the literature, about half of the articles in ESG-related studies are about the Industrial Technology sector, followed by the Economy sector, and then the Healthcare sector. For example, J. Li et al. [41] divided Chinese firms into industrial technology industries and non-industrial technology industries to compare the impact of ESG on firms' development performance. The study shows that industrial firms are limited by their own attributes, and the spillover effect of green innovation is not obvious, but the ESG of non-industrial firms can guide their peer firms to adopt green innovation behaviors and improve sustainable development performance. D. Kalia, and D. Aggarwal [42] study the healthcare sector and suggest that the relationship between ESG scores and FP cannot be generalized, in developed economies, the implementation of ESG activities has a positive impact on the performance of healthcare companies; however, in developing economies, the relationship is negative or insignificant.

Discrepancies in Research Findings and Suggestions for future research

Most research shows a positive relationship between ESG ratings and firm performance, meaning that better ESG ratings often lead to improved business outcomes. However, this relationship is complex and can vary based on industry sectors and economies. In some cases, higher ESG ratings have been linked to lower profitability. This shows that the connection between ESG ratings and performance isn't always positive and depends on various factors. More research is needed to understand why these negative correlations occur in certain contexts.

Relationship between ESG rating and financing cost

Cost of debt financing

Most of the findings show that in China, companies with better ESG performance have lower debt financing costs, and this positive impact is realized through different pathways and mediating mechanisms.

A growing body of research suggests that good ESG performance can significantly reduce the cost of debt financing in China. This reduction is achieved through various mechanisms, such as reducing corporate financial, information, and agency risks [43]. Further, it has been suggested that good ESG performance can alleviate corporate financing constraints [41]. However, it should be noted that these studies have used different methodologies and data sets, which could potentially explain the variations in their findings.

In addition, it has also been shown that the impact of ESG performance on the financing cost of firms is greater during the epidemic [44]; furthermore, some scholars have studied E, S, and G components separately and found that the financing cost of firms with better environmental and corporate governance performance is significantly lower [10].

A few studies show that ESG performance increases the cost of capital. From a new perspective, SMEs tend to obtain government subsidies by improving ESG performance based on the "rent-seeking" motive, which ultimately leads to an increase in their own cost of capital, but this negative impact is not irreversible, and increased R&D investment by enterprises can effectively inhibit the negative impact of ESG performance on the cost of capital [45].

Discrepancies in Research Findings

While the bulk of research points towards a positive correlation between ESG performance and lower debt financing costs, there are discrepancies in the literature. J. Liu [45] and X. Chen et al. [46] argue that ESG performance can increase the cost of capital, contradicting the prevailing view. Moreover, the heterogeneity test analysis by Y. Lian et al [43] shows that the effect of ESG performance is more significant in firms with high marketability. This finding diverges from other scholars, revealing a need for further study to confirm these results.

Gaps in Current Research

There are several gaps in the current research. First, while the research related to the impact of ESG on the cost of debt is well-developed, there are some disagreements in

the heterogeneity of this impact, which require further investigation. Second, most studies focus on Chinese A-share listed companies and do not categorize and compare industries. Different industries have varying sensitivities to ESG, and the degree to which debt costs are affected by ESG performance may differ greatly. Consequently, it is necessary to analyze different industries separately. Lastly, recent studies [47–49] show that in digital enterprises, digital transformation significantly improves the level of business credit financing. This suggests that the impact of ESG on debt financing costs might vary depending on the degree of digitalization, and whether there is a coordinating or inhibiting effect between the two needs further investigation.

In conclusion, while the majority of research indicates a positive influence of ESG performance on debt financing costs in Chinese companies, there are discrepancies and gaps in this field that call for further scrutiny. Future research should aim to address these inconsistencies and voids to provide a more comprehensive understanding of the role of ESG performance in debt financing costs.

Cost of equity financing

There are fewer studies on the impact of ESG performance on firms' cost of equity financing. Most studies have concluded that environmental, social and corporate governance performance is negatively related to a firm's cost of equity capital [46; 50]. However, the methods used to calculate the cost of equity capital vary across studies, which may lead to different conclusions.

X. Chen, and L. Yin [46] used the Capital Asset Pricing Model (CAPM) to measure the cost of equity, analyzing data from 2015–2020. Chen's research suggests that the negative correlation between ESG and the cost of equity capital is more pronounced during a recession and in state-owned enterprises. However, when the sample period was shortened to 2018–2020, the analysis showed equal significance for both state-owned and private enterprises.

Contrastingly, W. Lv [50] calculated the cost of equity using the Price Earnings Growth (PEG) model and found that there is an inverted "U" effect of a company's environmental performance on the cost of equity financing. When a company's environmental performance score is low, equity investors are skeptical about its future profitability, and the cost of equity financing for the company may increase as a result; whereas when a company's environmental performance score exceeds a certain level, investors notice that the company's "green" development prospects, and thus increase their investment preference for the company, and the cost of equity financing for the company may decrease as a result.

Discrepancies in Research Findings

In conclusion, while the majority of research points towards a negative relationship between ESG performance and the cost of equity capital, there are discrepancies and gaps in this field that warrant further investigation.

Digital transformation and ESG performance

In 2022, the scale of China's digital economy surpassed 50 billion for the first time, with the digital economy accounting for more than 40% of GDP, reaching 41.5% [51]. ESG and digital transformation, as two hot topics, their relationship is an emerging research field. The number of related studies has surged in the past year, with different research perspectives and several gaps. The following will analyze the current state of literature research from four aspects: quantification standards of digital transformation, the key position of digital transformation in corporate ESG performance, and heterogeneity analysis between different studies.

Quantification Standards of Digital Transformation

Regarding the quantification standards of the level of digital transformation, different scholars have adopted different methods. Most studies use text analysis, utilizing Python technology to identify the degree of digital transformation [52–8]. Additionally, H. Wang et al. [59] used a sample of 314 A-share listed companies included in the MSCI ESG rating to construct a corporate digital transformation feature database. Some scholars use the digital financial index published by Peking University to measure the level of digital transformation [60]. Moreover, S. Wang, and J. Esperança [61] used a questionnaire survey method, conducted comprehensive modeling and empirical analysis through the application of fsQCA and PLS-SEM methods. Q. Zhao et al. [62] analyzed the relationship between digital transformation strategy and ESG performance based on the positioning of the corporate digital transformation level through the Strategic Alliance Model (SAM). They collected data as a sample from 224 large-scale manufacturing enterprises in China and conducted empirical tests using hierarchical regression methods.

Digital Transformation: Dual Role as an Independent Variable and Moderator

Most studies indicate that corporate digital transformation can significantly enhance the company's ESG performance [53; 55; 57–59; 61; 63], but the results of mechanism testing are somewhat different. In mechanism testing, the research of J. Hu et al. [53] shows that corporate digital transformation can promote the company's ESG performance by encouraging green technology innovation, improving corporate internal information transparency, and enhancing corporate decision-making and operational management efficiency. The study of Y. Wang et al. [55] shows that corporate digital transformation improves the company's ESG performance by increasing external legitimacy pressure and alleviating information asymmetry. The mechanism analysis of H. Wang et al. [59] indicates that digital transformation has an indirect effect on ESG responsibility performance through three channels: corporate innovation ability, information interaction, and financial performance.

Z. Han et al. [57] suggest that digital transformation promotes corporate ESG performance by enhancing information transparency and total factor productivity. The path analysis of R. Zhang et al. [58] shows that green technology innovation plays a mediating effect between digital transformation and corporate ESG performance. In addition, Wang, Sh. et al. [61] used a questionnaire survey method and carried out comprehensive modeling and empirical analysis by applying the fsQCA and PLS-SEM methods, revealing that digital resources, organization, adoption, management, and corporate competitiveness indirectly have a positive impact on ESG through the mediating variable (corporate market performance). They innovatively found that the moderating variable (digital innovation culture) positively regulates two paths: digital application and corporate competitiveness, and digital application and digital management. Q. Zhao et al. [62] conducted an empirical test using the hierarchical regression method based on the positioning of the corporate digital transformation level through the Strategic Alliance Model (SAM), and collected data from 224 large-scale manufacturing enterprises in China as a sample through a questionnaire survey. The empirical results show that the two dimensions of the digital transformation strategy, namely business digitalization and platform digitalization, have a significant direct positive impact on corporate ESG performance.

Digital finance, as a specific application of digital transformation in the financial industry, also promotes the improvement of ESG performance. This point has been confirmed by the research of X. Zhao et al. [60], L. Xue et al. [63], and X. Ren et al. [64]. X. Zhao et al. [60] found in their mechanism study that digital transformation is the mediating variable for digital finance to influence corporate ESG performance. Digital finance can promote corporate digital transformation, thereby enhancing corporate ESG performance. The mechanism test of L. Xue et al. [63] shows that digital finance influences corporate ESG performance by promoting corporate green innovation, improving corporate goodwill, and reducing agency costs. In addition, political relationships have a negative moderating effect on the relationship between digital finance and corporate ESG performance, while regional institutional development has a positive moderating effect on this relationship. X. Ren et al. [64] found that digital finance can significantly promote corporate ESG performance, especially environmental and social performance. Secondly, our empirical findings show that digital finance impacts corporate ESG performance through green innovation and external regulation.

Some other scholars have separately studied the impact of digitalization on the E, S and G factors. Regarding the impact of digitalization on corporate governance, most notably in terms of agency costs, studies have shown that digitalization itself has a mitigating effect on agency conflicts, with shareholders becoming more active as a result, with industries such as information technology, communications, finance and healthcare being the most affected. These industries are most affected by innovations in ecosystem-based business models, and digitalization and ecosystem-based business models complement each other in mitigating principal-agent conflicts [65]. In addition, regarding the impact of digitalization on firms' social and environmental scores, M. Fang et al. [66] stated that digitalization helps firms to improve their goodwill and further improve their social (S) scores, but digitalization does not improve firms' environmental (E) scores.

Other scholars have presented different research viewpoints and conclusions. Y. Wang, and Y. Guo et al. [56] found that there is a significant "inverted U-shaped" relationship between the degree of corporate digital transformation and ESG performance. Mechanism analysis indicates that digital transformation mainly influences corporate ESG performance through two channels: corporate green innovation capability and the quality of information disclosure.

In studies on the moderating role of digital transformation, H. Chen, and L. Zhang [67] found that ESG performance can significantly enhance corporate value. Digital transformation can positively regulate the enhancing effect of ESG performance on corporate value by enhancing the company's green technological innovation capability and alleviating corporate financing constraints. X. Wang et al. [54] state that ESG performance partially mediates the impact of corporate R&D investment on corporate market value, while the level of corporate digitalization plays a positive moderating role in the enhancement of R&D investment on ESG performance. Q. Zhang, and Z. Liu [68] found that heterogeneous large shareholder governance has a significant positive effect on corporate ESG performance, and corporate digital transformation has a positive moderating effect on the relationship between heterogeneous large shareholder governance and corporate ESG performance.

Most studies consider corporate digital transformation as a way to significantly enhance ESG performance, mainly through promoting green technology innovation, improving information transparency, enhancing decision-making and operational efficiency, and indirect ways such as alleviating information asymmetry, enhancing innovation capability, and improving financial performance [53; 55;57–; 62; 63]. In the financial industry, digital finance is seen as a form of transformation and a driver to improve ESG performance [60; 63; 64]. However, research views are not consistent, such as the finding of an "inverted U-shaped" relationship between the degree of digital transformation and ESG performance [56]. Future research directions should delve deeper into the negative impacts of digital transformation and the differential moderating roles in different industries, regions, and scales of enterprises, and deepen the research on specific strategies to enhance ESG performance through digital transformation.

Diversification of Heterogeneous Influences

Due to the different research methods, data samples, and measurement tools used in different studies, the results in the analysis of heterogeneity tests are quite varied.

First of all, in terms of corporate ownership, H. Chen, and L. Zhang [67] found that the enhancement of corporate value by ESG performance is more pronounced in state-owned enterprises. This point of view is supported by J. Hu et al. [53], who found that digital transformation of state-owned enterprises has a stronger promotion effect on corporate ESG performance. However, the research results of R. Zhang, and X. Chen [58] show that the impact of digital transformation on corporate ESG performance is more significant in non-state-owned enterprises. This may mean that companies with different ownership structures may face different challenges and opportunities when undergoing digital transformation.

Secondly, in terms of regional differences, X. Zhao, and N. Dong [60] showed that the development of digital finance can significantly promote the ESG performance of enterprises in the eastern and central regions, but the impact on enterprises in the western region is not significant. This view is in line with the research of R. Zhang, and X. Chen [58], who found that the impact of digital transformation on corporate ESG performance is more significant in enterprises in the eastern and central regions. While X. Ren et al. [64] found that digital finance has a more positive effect on the ESG performance of enterprises in the central and western regions and non-low-carbon demonstration cities.

Thirdly, in terms of industry differences, H. Chen, and L. Zhang [67] found that in heavily polluting industries and high-tech industry companies, the enhancement of corporate value by ESG performance is more pronounced. However, Z. Han, and Y. Zhang [57] found that digital transformation has a more significant promoting effect on corporate ESG performance in high-tech enterprises, low-pollution industries, high digital finance regions, and low-pollution regions. X. Ren et al. [64] found that digital finance has a more significant impact on the ESG performance of low-digitally-transformed, low-profitability, regulated industries and high-carbon emission industries. Y. Yang, and J. Han [69] stated that in companies with low financing constraints, private enterprises, and non-technology enterprises, digital transformation has a more prominent effect on improving ESG performance by alleviating FC.

Researching the impact of heterogeneity is a key aspect of understanding ESG performance in China's emerging capital markets. Our review of multiple studies reveals how factors such as corporate ownership, regional differences, and industry differences influence the relationship between digital transformation and ESG. These differences may be due to differences in research methods, data samples, and measurement tools, which result in some degree of variance in research results. Future research needs to delve deeper into these heterogeneous influences to more accurately understand the role and impact of ESG in China's emerging capital markets.

Gaps in Current Research

However, despite these promising findings, the majority of studies suggest that digital transformation contributes to firms' ESG performance [53; 55;57–9; 63], with only a small number of studies linking the extent of firms' digitisation to the relationship between ESG and firm performance [67] . Future research should take this gap into account and investigate the complex interactions between digital transformation and ESG performance. In addition, the results of the heterogeneity analyses varied more widely in their conclusions due to the differences in research methodologies, pending more systematic and in-depth research in the future.

Current status of ESG investment research in China

ESG Investment Development

Despite economic recession and capital market volatility, ESG investment has shown remarkable growth, reflecting the resilience of ESG investment development and the increasing popularity of ESG investment concepts and strategies [70].

Y. Tian, and Q. Wu [71] have studied the development and practice of ESG investment in China. They point out that while the system of ESG investment information disclosure has been gradually established, the overall level of investment needs to be improved. Similarly, K. Wang, and T. Li [72] highlight the uneven development of various themes in Chinese ESG funds and the need for a deeper integration of the ESG investment concept.

X. Ma [73] also echoes that ESG investment strategies in the Chinese capital market are in a nascent stage due to the unclear rules of information disclosure and the difficulty of obtaining relevant information. G. Tu [74] emphasizes the establishment of ESG evaluation standards and participation in corporate governance as crucial steps to provide empirical support for ESG investment in China and help improve its capital market structure.

In recent years, mainstream investors in China are gradually introducing ESG investment concepts, and the fund industry, banking industry, and insurance industry are exploring ESG investment strategies, developing ESG evaluation criteria, and releasing ESG products [75]. X. Shen [76] suggests that ESG investment strategy, which focuses on whether the institutional arrangements of ESG can create value for investors, is more of a tool compared with socially responsible investment.

According to the results of literature search, China's ESG investments are mainly in pension funds, insurance industry, commercial banks' ESG responsible investment products, and ESG funds (the main types include pure ESG funds, environmental funds, social responsibility funds, corporate governance funds and pan-ESG funds), etc. The next step is to analyze and summarize the main academic researches, and to study the viewpoints and conclusions of different scholars.

ESG and pension funds

One of the most researched aspects of ESG investing is the relationship between ESG and pension funds. Since China

launched the construction of a green financial system in 2016, it has also actively explored ESG investment strategies for pension asset management. At present, China's pension funds included in the investment include basic pension insurance funds, enterprise (employment) annuity funds and pension funds, and national social security funds [77].

According to the existing research about ESG and pension funds, it can be mainly divided into two aspects: the relationship between ESG investment and pension funds, the challenges of ESG investment in pension funds.

X. Chen, and M. Zhang [32] discuss ESG investments can satisfy the risk aversion, long-term and public nature of pensions and screen out companies with long-term investment value. In addition, as far as aging is concerned, ESG investments can satisfy the risk aversion, long-term and public nature of pensions and screen out companies with long-term investment value.

Y. Zhang [78] highlights the emerging role of ESG investment in China's pension funds, despite the existence of challenges such as delayed corporate information disclosure and imperfect market rules. The research emphasizes the need for improved systems and market mechanisms, talent cultivation in ESG investment, and learning from international ESG practices to ensure the sustainable development of pension funds.

Discrepancies in Research Findings

While most scholars agree on the importance of ESG investment in pension funds and insurance companies, their views on the challenges and the ways to address them differ. Y. Zhang [77] emphasizes the need to improve the relevant system and market mechanism, while X. Chen, and M. Zhang [32] focus more on the characteristics of pension funds that make them suitable for ESG investments.

Gaps in Current Research

The current body of research mainly focuses on the role of ESG investment in pension funds and insurance companies. However, several gaps remain. First of all, most of the research studies focus on theoretical analysis, and less so on empirical analysis. Second, while the impact of ESG investment on pension funds has been extensively studied, there is less research on its impact on different types of insurance companies. Additionally, the potential moderating variables in the relationship between ESG investment and the performance of pension funds and insurance companies are not well-explored.

ESG and commercial banks

A review of recent literature reveals a vibrant discourse surrounding the need for Chinese commercial banks to adopt ESG investment strategies. Scholars differ in their perspectives on the implementation, benefits, risks, and challenges associated with such strategies.

ESG Investment as an Innovation in Chinese Banking Sector

As the leading financial institutions in China, it is crucial for commercial banks to pay attention to ESG in order to enhance operational efficiency and to advance the high-quality development of the country's social economy [79]. L. Wang [80] notes that institutions such as the People's Bank, ICBC, Industrial Securities, ETF, and Guoshou Asset have already applied ESG responsible investment concepts, launching ESG investment products. J. Li et al. [79] use an innovative model, considering market share, green credit, social donations, executive compensation, and ESG scores, to assess the efficiency of 20 listed banks in China. They found that urban cooperative banks were the most efficient, joint-stock commercial banks performed best in the profit stage, while state-owned commercial banks performed best in the market and sustainable development stages. The study also revealed that state-owned banks lead in ESG investment, while joint-stock banks lag in ESG performance.

ESG Investment: A Strategy and Responsibility

Furthering the scholarly discourse, Y. Luo, and W. Zhang [81] identify the core characteristic of ESG investment as the incorporation of social responsibility into investment decisions. They argue that such strategies lead to improved investment structure, optimized risk control, and ultimately, higher long-term returns. Aligning with this perspective, Z. Yuan [82] suggests that ESG investment strategy in commercial banks' asset management is not only a strategy but also a reflection of the banks' social responsibility.

Risks and Challenges in ESG Investment

Although many scholars advocate for ESG investment, others point out potential risks and challenges. H. Jiang et al. [83] warn of increased risk-taking in commercial banks through reputational spillovers, particularly for joint-stock banks. They suggest that the implications of ESG investment are stronger for such institutions. Z. Cao, and H. Wang [84] pinpoints a significant challenge in the adoption of ESG investment strategies. He argues that commercial banks lack the scientific means to evaluate their customers' ESG quality. Moreover, he notes that the ESG quality of customers varies widely among different industries, with the highest in the banking industry, and the chemical industry being in the middle.

Conclusion and Research Gaps

While a consensus exists on the need for ESG investment strategies in Chinese commercial banks, scholars differ on the associated risks and challenges. Additionally, research is lacking on effective means of ESG quality evaluation in various customer industries. This indicates a need for further research to develop scientific methods of ESG quality assessment and to explore the different implications of ESG investment across various industries in the commercial banking sector.

ESG Funds

ESG funds are recognized as important engines for sustainable development investments. However, scholars diverge in their perspectives on ESG funds' development, impacts, influencing factors, and challenges in China.

Development and Impact of ESG Funds

K. Wang, and T. Li [85] define ESG funds as investment products incorporating non-financial indicators into the decision-making process. They note that ESG funds in China are generalizing, but with uneven development across various themes, necessitating deeper integration of the ESG investment concept. Y. Luo, and W. Zhang [81] investigate the motivations and impacts of ESG funds. They argue that ESG funds carry out due diligence management of their holdings to enhance corporate ESG performance, driven by social needs and their interests. They found that the higher the percentage of holdings, the better the corporate ESG performance, and active ESG funds excel over passive funds in enhancing corporate ESG performance. Y. Qi et al. [86] apply the ESG concept to QDII funds, using simulation to construct the funds on a rolling basis. They found that ESG-constructed QDII funds yield better returns, with no significant risk differences from market indices. These funds are characterized by high mean and low variance, higher deterministic equivalent returns, and better Sharpe ratio performance.

ESG Funds Resilience and Influencing Factors

J. Zhang [87] explores the factors influencing ESG investment funds' willingness to execute. He identifies ESG fund risk rating and fund manager education as the main influencing factors. Interestingly, he found that an ESG fund's historical returns positively influence willingness to execute, while fund manager tenure has a negative influence. X. Chen, and H. Liu [88] explored the impact of investor attention on ESG performance of listed companies. They discovered that different types of investor attention, such as sentiment, interaction, research, and shareholding, all enhance companies' ESG performance.

Challenges and Future Directions

Despite its promise, ESG investment faces significant challenges. J. Xie, and K. Fu [89] notes the increasing prevalence of the "pseudo-ESG phenomenon" in ESG funds and calls for deeper academic research on this issue. K. Wang, and T. Li [85] propose a three-pronged approach for regulatory intervention: guiding ESG investment through policies, developing ESG disclosure standards to promote ESG fund product development, and designing a scientific ESG evaluation system to facilitate the maturation of ESG fund products.

Conclusion and Future Research Directions

While the potential benefits and impacts of ESG funds are well-documented, studies diverge on influencing factors and present challenges such as the "pseudo-ESG phenomenon". Further research is needed to explore these challenges and examine the effectiveness of proposed solutions, such as regulatory interventions and ESG evaluation systems. The role of investor attention in enhancing companies' ESG performance warrants further exploration. It's also critical to investigate the impact of fund manager tenure on the willingness to execute ESG investments, a less-studied area in the current literature.

ESG Investor Preferences and Decisions

Literature on ESG preferences among institutional investors in the A-share market presents a fascinating array of perspectives. Scholars have delved into the relationship between ESG performance and institutional investment, the role of ESG in corporate bond risk, and the preference for green innovation.

F. Zhou et al. [90] and X. Bai et al. [91] suggest a strong preference among institutional investors for firms demonstrating good ESG performance, even at the cost of withstanding lower short-term business performance. This perspective is reinforced by M. Li [92], who establish a positive correlation between a company's ESG social responsibility and the shareholding of institutional investors.

Contrastingly, M. Jin [93] focuses on the preference for green innovation among institutional investors. His research notes that companies with high ESG performance tend to have a higher green innovation capacity, and he suggests that institutional investors are willing to tolerate lower current excess returns for companies with strong green innovation capabilities.

Conclusions and Research Gaps

While these perspectives provide valuable insights, they also underscore the need for further research on the tolerance of institutional investors for lower short-term performance, the role of green innovation, and the impact of ESG performance on corporate bond risk.

ESG and Green Finance

Current research primarily focuses on the development of green finance, the relationship between green finance and ESG performance, and the link between green finance and corporate value. Notably, researchers explore the relationship between green finance policies and ESG performance, analyze the development pathway and strategies of green finance, and investigate how green finance and ESG performance impact the value of a corporation.

Green Finance Development

A paper by J. Zhang [94] proposed a pathway to enhance China's green financial development. The author suggested that the enhancement could be achieved through multi-subject participation, promotion of green finance pilot projects, and strengthening of green finance training. Zhang also emphasized the importance of enriching green finance products and optimizing risk governance mechanisms.

Green Finance and ESG Performance

S. Qian, and W. Yu [95] investigated the effect of green finance policy on ESG performance in heavily polluting enterprises, using China's Green Financial System Guidelines and a difference-in-differences design. Their findings suggest that the adoption of the policy improves ESG performance, with the effect being more pronounced for firms with better internal and external governance.

On the other hand, H. Deng et al. [96] exploited a quasi-natural experiment in China, the Green Financial Reform and Innovation Pilot Zones (GFRIPZ), to analyze the impact of green financial policy on corporate risk-taking. They found that such policies positively affected corporate risk-taking, particularly among companies with low R&D investment and poor ESG performance.

Green Finance and Corporate Value

H. Wang et al. [97] investigated the impact of commercial banks' fulfillment of social responsibility on their corporate value from the green finance perspective. Their research results indicate that the implementation of social responsibility and green finance strategies significantly enhanced the corporate value of the banks.

Tu, Q. Li, and H. Li [98] utilized a triple-difference model to quantitatively assess the enhancement effect of the establishment of green financial reform and innovation pilot zones on the value of green enterprises. The research findings reveal that the establishment of green financial reform and innovation pilot zones significantly boosts the value of green enterprises. Furthermore, they employed the level of ESG information disclosure as a moderating variable. The research shows that an improvement in the level of internal ESG information disclosure positively moderates the promotional effect of the pilot zones on the enhancement of corporate value.

ESG Performance and Green Finance Policy

A study by X. Chen [99] used a difference-in-differences model to analyze the effect of green finance policy implementation on the ESG performance of listed companies. The results suggested a positive correlation between the implementation of green finance policies and ESG performance.

Similarly, Y. Zhu, and D. Li [100] used fixed-effect regression methods to empirically study the relationship between green finance and ESG performance. Their findings indicated that green finance promotes ESG performance, with the effect being more pronounced for companies with higher public attention.

Conclusions and Research Gaps

Despite the growing body of research on green finance and ESG performance, certain gaps remain. For instance, there is a lack of consensus on the causal relationship between green finance and ESG performance. While some studies suggest that green finance improves ESG performance, others indicate that green finance can lead to increased corporate risk-taking. Further research is needed to clarify this relationship.

Conclusion

This study employs a systematic literature review method, searching for literature related to ESG in China's emerging capital markets from three databases: Scopus, WanFang, and CNKI. The literature is analyzed using Vosviewer software, systematically selecting the most significant and cutting-edge themes: "Development and Policy of ESG in China", "The Impact of ESG Rating on Corporate Finance", "Digital Transformation and ESG Performance", and "ESG Investment". These themes' research methods, data, and conclusions are comprehensively summarized, and differences in related thematic research are compared to identify gaps in each theme.

Current research on ESG regulation and policy indicates that China lacks compulsory regulations, with most policies being voluntary and encouraging. Most policies and research primarily focus on environmental and governance aspects, while the "social" part is often less considered. Furthermore, most studies on the impact of China's ESG policies on corporate ESG performance and investment show positive effects, but these studies are mainly based on policies related to the "environment". Research on the impact of "social" and "governance" policies on corporate ESG performance and investment is still lacking. Also, there are few case studies on the specific impact of specific policies on corporate ESG disclosure, with most policy research still at the macro analysis level. Therefore, it is recommended to study this theme in the future.

Our analysis of China's ESG rating system reveals the relationship between ESG ratings, corporate performance, and financing costs, including debt financing and equity financing. We found that conclusions about the impact of ESG on financing costs are inconsistent, and the scope of research on equity financing costs is limited, requiring further investigation. Moreover, we observed that all the studies are based on companies listed on the A-share market in China. However, as different industries have different sensitivities to ESG, the impact of ESG on Corporate Finance will also vary. Therefore, it is suggested to conduct research by industry and make comparisons.

The relationship between digital transformation and ESG is a relatively novel and popular topic in current research. Scholars have adopted various methods to quantify the level of corporate digital transformation, including text analysis, constructing characteristic databases, using digital financial indexes, and questionnaire surveys. Despite heterogeneity, most studies believe digital transformation can improve corporate ESG performance by promoting green innovation, enhancing transparency, and increasing management efficiency. In the financial industry, digital finance, as a form of digital transformation, is also seen as a driver to improve ESG performance. However, some studies have found a "U-shaped" relationship between the degree of digital transformation and ESG performance. Overall, corporate digital transformation is considered an important factor in promoting ESG performance improvement, but this relationship may be influenced by various factors and requires further research and discussion. In addition, current research significantly differs in the heterogeneity analysis of how corporate ownership, regional, and industry differences influence the relationship between digital transformation and ESG. Future research should consider these gaps and study the complex interactions between digital transformation and ESG performance.

Research on ESG investment indicates that although China's ESG investment is still in the early stages, there is an urgent need to improve investment levels and establish related investment systems. Institutional investors and government policy guidance are considered key drivers to promote ESG investment development. Most research focuses on the relationship between pension funds and ESG investments, finding that ESG investments align with the long-term value concerns of pension funds. Although the rapid development of ESG investment in China's pension funds has attracted attention, challenges such as imperfect market rules still exist. A few scholars have begun to study the specific strategies of pension funds' ESG investments in insurance industry companies. Commercial banks and other financial institutions have made significant progress in implementing ESG strategies, launching a series of ESG investment products that satisfy the ESG responsibility requirement of financial institutions and enhance their risk-bearing capacity and ability to obtain excess returns. However, current research on ESG funds, ESG bonds, ESG credit, and equity is still relatively scarce, with most studies still at the theoretical concept level, quantitative studies are few, and the research scope is not comprehensive. This may be due to China's financial market ESG investment still being in the early stages and a relatively small number of cases worthy of study. With the growth of China's ESG investment, the development of ESG investment strategies suitable for emerging developing countries like China will become a key topic. Existing literature emphasizes the importance of continuing to focus on this evolving field, especially understanding the role of various financial institutions and identifying effective strategies to promote ESG investment.

This review provides a comprehensive overview of ESG-related research in China's emerging capital markets, revealing the main themes and development frontiers of current research, as well as the differences in methods, data, and conclusions of each theme's research. We found that although ESG research and practice in China are still in the early stages, some important research results and practical experiences have emerged. However, there are also some research gaps and challenges that future research and practice need to resolve. We look forward to further research and practice, which can provide more effective and targeted ESG practices and investment strategies for China and other emerging market countries, making a greater contribution to sustainable development.

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The article **was submitted** 08.10.2023; **approved after reviewing** 10.11.2023; **accepted for publication** 30.11.2023.