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ESG in China: A review of practice and research, and future research avenues

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ABSTRACT

This paper reviews the practice and research on environmental, social and governance (ESG) in China. It finds that (1) under China's top-down framework, ESG practices have grown substantially in ESG disclosure, ESG rating and ESG investing; and (2) ESG research has focused on corporate ESG disclosure and performance as well as ESG investing. Although the topics of the ESG studies reviewed in this paper are similar to those of ESG research in other countries, China's ESG research enriches international ESG research by showing two distinct characteristics, namely, the country's unique institutional context and the dominance of quantitative research methods. Future research can investigate ESG standards development and the impact of traditional Chinese ethics, modernization and internationalization on ESG in China.
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1. Introduction

Traditional Chinese ethics offer a comprehensive guide to one's interactions with nature and society. It teaches respect for nature and emphasizes the deep connection between people and nature. The presiding idea in traditional Chinese ethics is to use nature wisely and seek a balance where both nature and human beings can thrive. Chinese philosophies such as Confucianism and Taoism attempt to find a balance between doing what is right and seeking profit. They hold that even when engaged in business, morality is important, and it can teach us how to gain wealth in a morally justifiable way. These ancient Chinese teachings encourage human beings to live in harmony with nature and society.

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Environmental, social and governance (ESG) has emerged over the past two decades as a crucial ethical construct in modern economies. The concept of ESG is aligned with traditional Chinese ethics, as they both encourage companies to seek a balanced relationship with nature and society. The concept of ESG was first introduced in 2004, when Kofi Annan, the then United Nations Secretary-General, initiated a discussion about how to promote ethical investment practices. As a result of this call to action, a group of 18 financial institutions from nine countries collaborated in 2005 on the influential report *Who Cares Wins: Connecting Financial Markets to a Changing World*. This report argued that financial institutions should consider ESG factors in their investment decisions; this marked the first formal presentation of the ESG concept. In 2006, the United Nations established the Principles for Responsible Investment (PRI), which was designed to help investors understand the impact of ESG on investment and encourage financial institutions to integrate ESG into their investment practices. The PRI defines ESG investing as a strategy that incorporates environmental, social and governance factors into investment decisions, an approach often referred to as sustainable, ethical, or impact investing (PRI, 2018). By the end of 2020, sustainable investment in the world's five major markets[1] had reached US$35.3 trillion in value (Global Sustainable Investment Alliance, 2021). As one of Asia's most vibrant green finance regions, China is a major player in the global ESG market. China has become the world's second-largest green bond market (Climate Bonds Initiative, 2022), and the total value of green loans from 21 Chinese major banks reached US$1.69 trillion by the end of 2020 (The State Council, 2021). China's efforts to develop a sustainable economy have gone a long way toward achieving the Sustainable Development Goals proposed by the United Nations. China's progress in ESG is a contemporary manifestation of the country's traditional ethics, while also being a way of pursuing high-quality economic development.

The widespread adoption of ESG has stimulated academic research in this area. The number of articles published per year on the Web of Science on the topic of "ESG" increased rapidly from 94 in 2015 to 1,410 in 2022. Meanwhile, the number of articles published per year on the topic of "ESG and China" increased from 3 in 2015 to 117 in 2022. Several literature reviews have summarized the development of global ESG research, but these have primarily focused on North America and Europe. Tsang et al. (2022) summarize the literature related to the determinants, characteristics, consequences and moderators of ESG disclosure. Gillan et al. (2021) review the literature on the factors and economic consequences of ESG at the corporate finance level. Brooks and Oikonomou (2018) and Huang et al. (2022) focus on the relationship between ESG and financial performance, while Grewal and Serafeim (2020) focus on measuring and managing corporate sustainability performance. Daugaard (2020) uses quantitative analysis to review the literature related to ESG investing systematically.

However, the scope of previous ESG literature reviews has been restricted to developed economies; none of these reviews considers the relevant literature from emerging markets, even though ESG in these markets is an indispensable part of global ESG development. In addition, previous literature reviews only assess ESG research along a single dimension, such as information disclosure, corporate behavior or ESG investing; this suggests that a comprehensive examination of ESG research is still urgently needed.

The two main contributions of this paper are as follows. First, this paper attempts to fills the research gap by offering a comprehensive review of ESG practice and research in China, the largest emerging economy. Specifically, we review studies on China's ESG (both in Chinese and English) and identify characteristics of ESG research in China including the utilization of the country's unique institutional context and the dominance of quantitative research methods. Second, this paper proposes three avenues for future research, namely, (1) the impact of the interaction between traditional Chinese ethics and the country's modernization on corporate ESG in China, (2) the impact of the internationalization of Chinese business on ESG in China, and (3) the development of China's ESG standards.

The remainder of this paper is structured as follows. Section 2 reviews the development of ESG practices in China from the perspectives of ESG disclosure, ESG rating and ESG investing. Section 3 describes the paper's methodology. Section 4 examines previous studies of ESG disclosure by Chinese companies. Section 5 summarizes research on corporate ESG performance from the perspectives of driving factors and economic con-

[1] These five markets are Europe, America, Canada, Australia and Japan (Global Sustainable Investment Alliance, 2021).

sequences. Section 6 reviews the research on ESG investing in China. Section 7 identifies the characteristics of ESG research in China. Section 8 outlines the paper's conclusions and proposes future research avenues on ESG in China.

2. Development of ESG practices in China

The development of ESG practices in China can be divided into three main stages, as shown in Fig. 1. The first stage began in 2001 when China joined the World Trade Organization (WTO) and integrated itself into the global economy. As a result, the concept of social responsibility was gradually embraced by Chinese companies. A significant turning point was reached in 2008, when the government made social responsibility reporting mandatory for particular companies (as discussed in detail in section 2.1). This led directly to a considerable increase in the number of listed companies publishing these reports. By 2011, over 500 A-share listed companies in China had issued social responsibility reports or sustainability reports (Chinese Association for Public Companies, 2022).

The second stage commenced after the 18th National Congress of the Communist Party of China (CPC) in 2012, and especially after the introduction at the Fifth Plenary Session of the 18th CPC Central Committee in 2015 of a new development philosophy emphasizing *innovation, coordination, green, openness and sharing*. During this stage, sustainable development became a national goal. This was marked by the issuance of *Guidelines for Establishing the Green Financial System* by the People's Bank of China and six other ministries in 2016, which increased the use of ESG ratings and green financial products in the Chinese market. Subsequently, Morgan Stanley Capital International (MSCI) partially included China A-shares in the MSCI Emerging Markets Index in 2018.

The third stage began in 2020, when the "dual carbon"[2] goal was announced as a national strategy, meaning that low-carbon transition became a priority. It is becoming more mainstream since ESG emphasizes environmental factors and is closely integrated with capital markets. This has in turn attracted attention from various sectors.

2.1. ESG disclosure practice

Sustainability reports serve as a measurement and disclosure mechanism for internal and external stakeholders, and are a tool by which an organization can achieve its sustainable development goals (GRI, 2016). In China, most companies voluntarily disclose ESG information.

China's ESG disclosure regulations differ between the capital markets in mainland China and in Hong Kong. In mainland China, ESG disclosure regulations were released as early as 2008, when the Shenzhen Stock Exchange required companies in the Shenzhen 100 Index to disclose social responsibility reports. The Shanghai Stock Exchange made it mandatory for companies in its Corporate Governance Index, companies that were listed both domestically and internationally, and financial companies to publish their social responsibility reports. Thereafter, sustainability disclosure transitioned from social responsibility reports to ESG reports. In June 2018, the China Securities Regulatory Commission (CSRC) issued the *Code of Corporate Governance Guidelines for Listed Companies*, formally establishing a framework for ESG disclosure. The CSRC revised its requirements for annual and semi-annual reports in 2021, requiring listed companies to disclose ESG information. In Hong Kong, the Hong Kong Stock Exchange (HKEX) introduced the *Environmental, Social, and Governance Reporting Guide* in 2012 and revised guidelines in 2016 and 2020, shifting disclosure requirements from voluntary to semi-mandatory and then to mandatory. The mandatory disclosure requirements in HKEX have driven the sustainability information disclosure of Chinese A-share listed companies (Fang and Guo, 2018).

These ESG disclosure regulations have greatly increased ESG disclosure and assurance in China. According to the Chinese Association for Public Companies (2022), an increasing number of companies are issuing

[2] At the General Debate of the 75th Session of the United Nations General Assembly on 22 September 2020, Chinese President Xi Jinping announced that China aimed to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060; this is referred to as the "dual carbon" goal (https://www.xinhuanet.com/english/2020–09/23/c_139388764.htm).

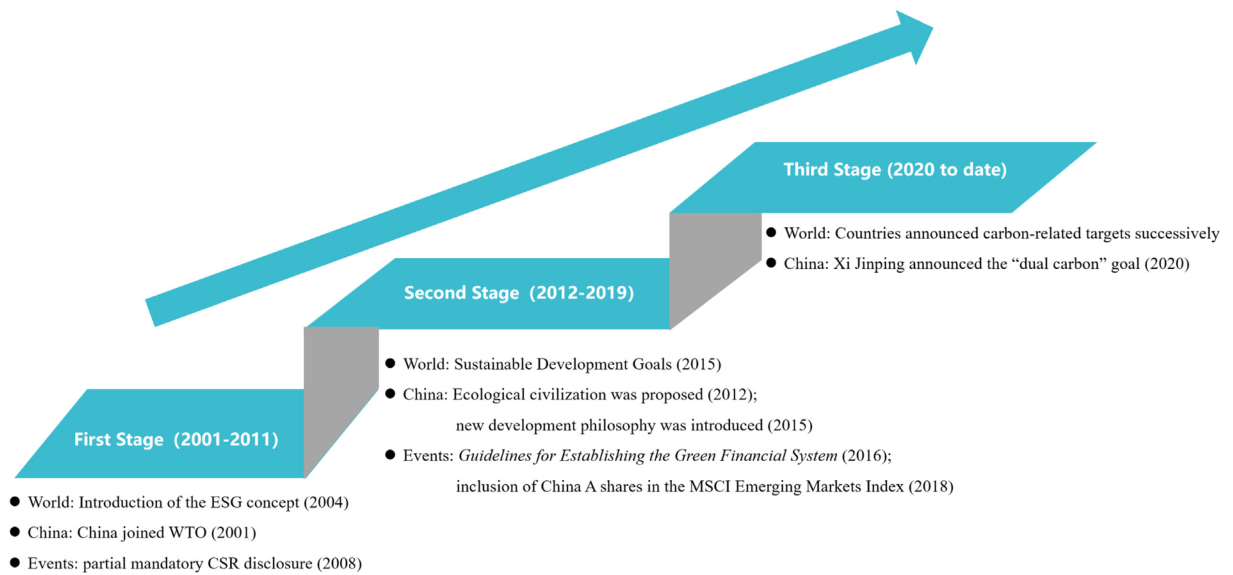

Fig. 1. Three stages of ESG practice in China.

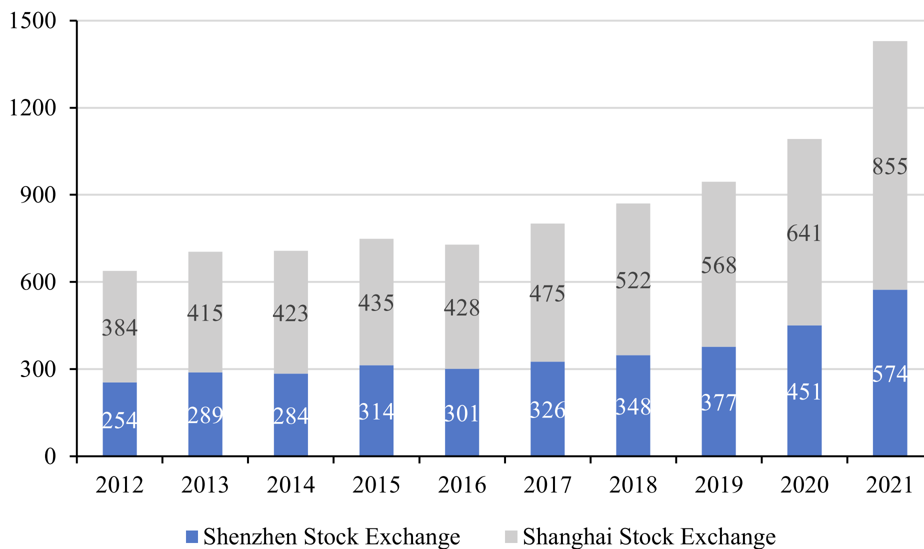

Fig. 2. Number of ESG reports disclosed by Chinese listed companies Data Source: Chinese Association for Public Companies (2022).

ESG or sustainability reports. Fig. 2[3] shows that the number of listed companies issuing ESG-related reports rose from 638 in 2012 to 1,429 in 2021. In 2021, 30% of listed companies issued ESG-related reports, of which 77% were social responsibility reports, 13% were ESG reports and 5% were sustainability reports, as shown in Fig. 3 (Chinese Association for Public Companies, 2022).[4] Furthermore, data from China Stock Market & Accounting Research (CSMAR) show that many listed companies voluntarily adopted the Global Reporting Initiative (GRI) Standards. This proportion rose from 20% in 2012 to 42% in 2021. In terms of ESG assur-

[3] This section only makes use of data from Chinese A-share listed companies in the last 10 years. The same applies below.

[4] Chinese listed companies publish ESG-related reports under a variety of titles, such as social responsibility reports, ESG reports and sustainability reports.

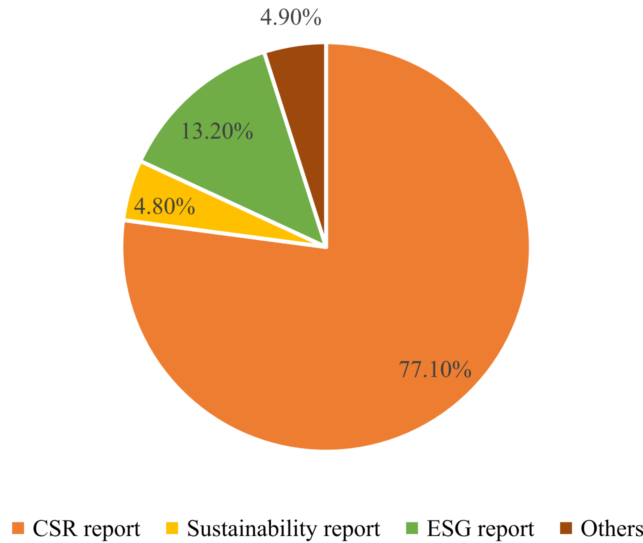

Fig. 3. Titles of ESG-related reports published by Chinese listed companies in 2021 Data Source: Chinese Association for Public Companies (2022).

ance, Fig. 4 shows that the proportion of listed companies purchasing ESG assurance services has steadily increased since 2019, although earlier years saw a downward trend. Various entities provide ESG assurance services, including public accounting firms, consulting institutions, industry associations (such as the China National Textile and Apparel Council) and experts.

2.2. ESG rating

ESG rating is a comparative assessment of companies or financial products in terms of strategies, disclosure or performance on specific ESG themes (European Commission, 2021). It is an effective tool that investors can use to measure a company's or financial product's sustainability.

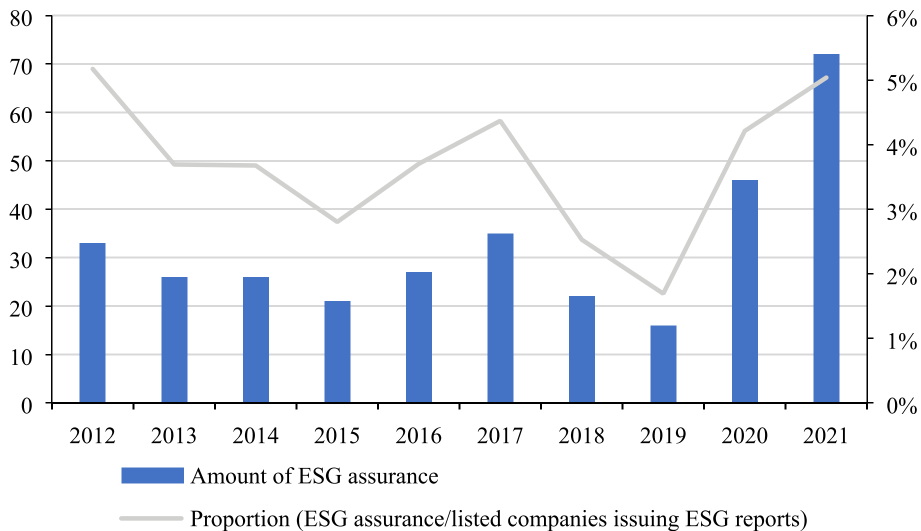

Fig. 4. Amount and proportion of ESG assurance disclosed by Chinese listed companies Data source: CSMAR database.

ESG rating was introduced relatively late in China. However, an increasing number of companies are covered by domestic and international rating agencies. In China, ESG rating agencies began to emerge in 2015, introducing evaluation systems and rating data. Leading ESG rating agencies include China Securities Index Co., Ltd., Beijing SynTao Green Finance Consulting Co., Ltd., Sino-Securities Index Information Service (Shanghai) Co., Ltd., Rankins Global (Beijing) Consulting Co., Ltd., etc. Globally, MSCI incorporated some Chinese companies into the MSCI Emerging Markets Index in 2018, which heightened Chinese companies' attention to ESG. Subsequently, both FTSE Russell and S&P Dow Jones included A-share companies in their indices, driving more international rating agencies to include Chinese companies in their rating scope. Table 1 provides a comparison of major ESG rating agencies.

The sources of ESG rating agencies primarily fall into four categories: company disclosure, media reports, alternative data and modeled data (Lee, 2021). Based on ESG news, media-sourced data are used to assess and model corporate ESG risks. Alternative data include weather maps, satellite data and an array of external databases. Modeled data rely on models to fill in gaps in corporate disclosure, such as forecasting emission trajectories based on emission reduction targets and historical records. While ESG data sources are fundamentally consistent, the rating methods used by different agencies vary because of divergences in scope, measures and weighting (Berg et al., 2022). Thus, there is no universal consensus on the ESG ratings of listed companies (Zhang and Yuan, 2022). Given this divergence, institutional investors are increasingly reassessing and adjusting their rating data to ensure consistency with their investment objectives. For instance, Southern Asset Management recently developed an ESG rating system and has used it to rate over 9,200 listed companies and bond issuers (Southern Asset Management, 2022). These rating results are integrated into the entire investment decision-making process, from pre-investment to post-investment.

2.3. ESG investing

Green finance is the primary manifestation of ESG investment in China. The People's Bank of China and six other ministries issued the *Guidelines for Establishing the Green Financial System* in 2016, which set out the basis for green finance. A subsequent series of policies have been released to guide and standardize green finance, which has continuously increased the scale of the green credit and bond market. Fig. 5 shows that green credit by major Chinese banks rose steadily from RMB 895 billion in 2012 to RMB 11,899 billion in 2021. Fig. 6 presents green bond in China from 2016 to 2021, which shows a significant surge in 2021.

ESG financial products include ESG funds, ESG indices and ESG banking wealth management products. Of these, ESG funds and ESG indices are the fastest-growing segments. As of June 2022, there were 374 publicly offered ESG funds in China, which exceeded 241.9 billion shares with a net total fund value of RMB 392.5 billion. These include 309 actively managed funds, focusing on low-carbon environmental protection, energy conservation, new energy and carbon neutrality, and 65 passive index funds that mainly track indices of environmental protection, new energy, photovoltaics, ecological protection and batteries. A total of 698 ESG indices were issued, including 274 core ESG indices and 424 broad ESG indices. (Zhang and Yuan, 2022).

There are seven main ESG investment strategies: ESG integration, negative screening, norms-based screening, positive screening, shareholder engagement, sustainability investment and impact investment. Among these, screening strategies are the main type of ESG investment strategy used by institutional investors in China. Screening strategies help institutional investors reduce investment risk (Alessandrini and Jondeau, 2021). Fig. 7, which presents data from the *China Fund Industry ESG Investment Special Survey Report* (Asset Management Association of China, 2020a, b), shows that 85% of the surveyed securities investors and 82% of the surveyed equity investors agreed that risk reduction is the main driving force for undertaking ESG/green investment.

3. Methodology

Following prior studies (Linnenluecke et al., 2020; Fan et al., 2021; Tsang et al., 2022), this paper systematically reviews and summarizes the literature on ESG in China. The literature reviewed in this paper concentrates on the concept of ESG as a whole. This paper does not review research on CSR or on individual ESG components. The data sources are twofold: English literature and Chinese literature.

Table 1
Comparison of ESG rating agencies.

Rating agency	Data sources	Indicator rating structure	Rating scheme	Update frequency
Bloomberg	1. Listed companies' websites, announcements, sustainability reports, etc. 2. News and public opinion3. Other public data	3 pillars, 120 issues	0–100	Annually
FTSE Russell	1. Listed companies' websites, announcements, sustainability reports, etc. 2. Regulatory authorities 3. News and public opinion4. Industry associations	3 pillars, 14 issues, 300+ data points	0–5	Monthly
MSCI	1. Listed companies' websites, announcements, sustainability reports, etc. 2. Regulatory authorities 3. News and public opinion 4. Industry associations5. Corporate communication channels	3 pillars, 10 issues, 37 sub-issues	7 levels, from low to high: CCC, B, BB, BBB, A, AA, AAA	Annually
Refinitiv	1. Listed companies' websites, announcements, sustainability reports, etc. 2. Regulatory authorities 3. News and public opinion4. Industry associations	3 pillars, 10 issues, 186 sub-issues, 500+ data points	12 levels, from low to high: D−, D, D+, C−, C, C+, B−, B, B+, A−, A, A+	Weekly
RepRisk AG	1. Regulatory authorities 2. News and public opinion3. Industry associations	3 pillars, 28 issues, 73 sub-issues	10 risk levels, from high to low: D, C, CC, CCC, B, BB, BBB, A, AA, AAA	Monthly
China Securities Index Co., Ltd., CSI	1. Listed companies' websites, announcements, sustainability reports, corporate charters, etc. 2. Regulatory authorities 3. News and public opinion4. Specific data in CSI	3 pillars, 14 issues, 22+ sub-issues, 100+ data points	10 levels, from low to high: D, C, CC, CCC, B, BB, BBB, A, AA, AAA	Monthly
Beijing SynTao Green Finance Consulting Co., Ltd., SynTao	1. Listed companies' websites, announcements, sustainability reports, etc.2. News and public opinion	3 pillars, 14 issues, 200+ data points	10 levels, from low to high: D, C−, C, C +, B−, B, B+, A-, A, A+	Quarterly
Sino-Securities Index Information Service (Shanghai) Co., Ltd., Huazheng	1. Listed companies' websites, announcements, sustainability reports, corporate charters, etc. 2. Regulatory authorities3. News and public opinion	3 pillars, 14 issues, 26 sub-issues, 130+ data points	9 levels, from low to high: C, CC, CCC, B, BB, BBB, A, AA, AAA	Quarterly
Rankins Global (Beijing) Consulting Co., Ltd., RKS	1. Listed companies' websites, announcements, sustainability reports, etc. 2. Regulatory authorities 3. News and public opinion4. Social organization surveys	3 pillars, 26 issues, 100+ data points	7 levels, from low to high: CCC, B, BB, BBB, A, AA, AAA	Annually

(*continued on next page*)

Table 1 (*continued*)

Rating agency	Data sources	Indicator rating structure	Rating scheme	Update frequency
China Alliance of Social Value Investment, CASVI	1. Listed companies' websites, announcements, sustainability reports, corporate charters, etc. 2. Regulatory authorities3. News and public opinion	3 pillars, 9 issues, 27 sub-issues, 55+ data points	10 levels, from low to high: D, C, CC, CCC, B, BB, BBB, A, AA, AAA	Semiannually
Wind Information Technology Co., Ltd., Wind	1. Listed companies' websites, announcements, sustainability reports, etc. 2. Regulatory authorities 3. News and public opinion4. Industry associations	3 pillars, 27 issues, 300+ data points	7 levels, from low to high: CCC, B, BB, BBB, A, AA, AAA	Monthly
MioTech Information Technology (Shanghai) Co., Limited, MioTech	1. Listed companies' websites, announcements, sustainability reports, corporate charters, etc. 2. Regulatory authorities3. News and public opinion	3 pillars, 19 issues, 700+ sub-issues, 1,000+ data points	12 levels, from low to high: D, DD, DDD, C, CC, CCC, B, BB, BBB, A, AA, AAA	Quarterly

Data source: Zhang and Yuan (2021).

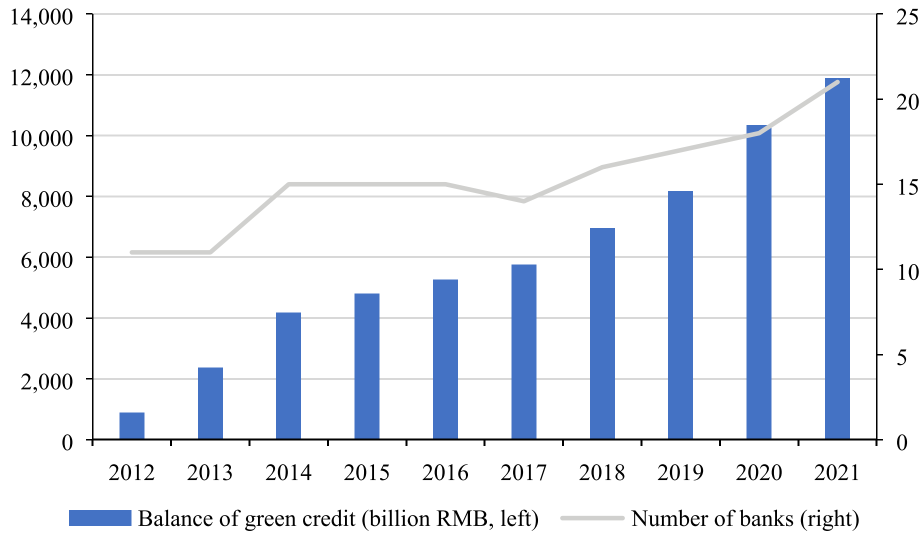

Fig. 5. Balance of green credit by major Chinese banks Data source: CSMAR database.

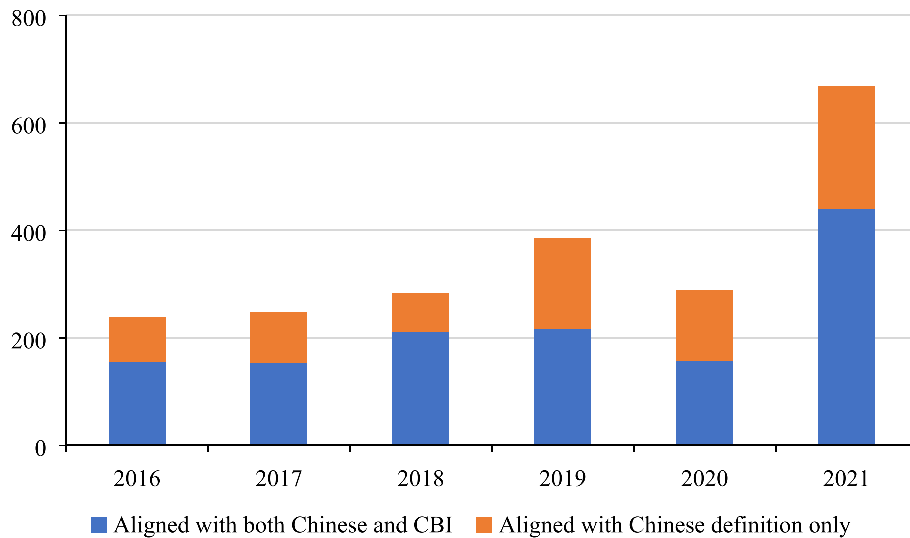

Fig. 6. Volume of green bond issuance in China (in billions of RMB) Data Source: Climate Bonds Initiative (2022).

3.1. The English literature

Following the methodology of Khlif and Chalmers (2015) and Daugaard (2020), a search of the English-language literature is performed on various databases such as EBSCO, Scopus, Emerald, Web of Science and Wiley. The search query is constructed as "Topics=(ESG OR Environment* Social* Govern*) AND (China OR Chinese)". The following filtering is applied: English-language studies published in journals listed in either JCR Q1, ABDC A/A*, or ABS 3 and above are included; the journal category is restricted to the fields of economics or management; and the theme is limited to ESG in China.

Ultimately, we obtain 44 English articles. Fig. 8 shows the distribution of the English literature across journals. The 44 articles were published between 2014 and 2023, as shown in Fig. 9 (including several articles published online). Fig. 10 analyzes the keywords used in the English literature; it demonstrates that ESG

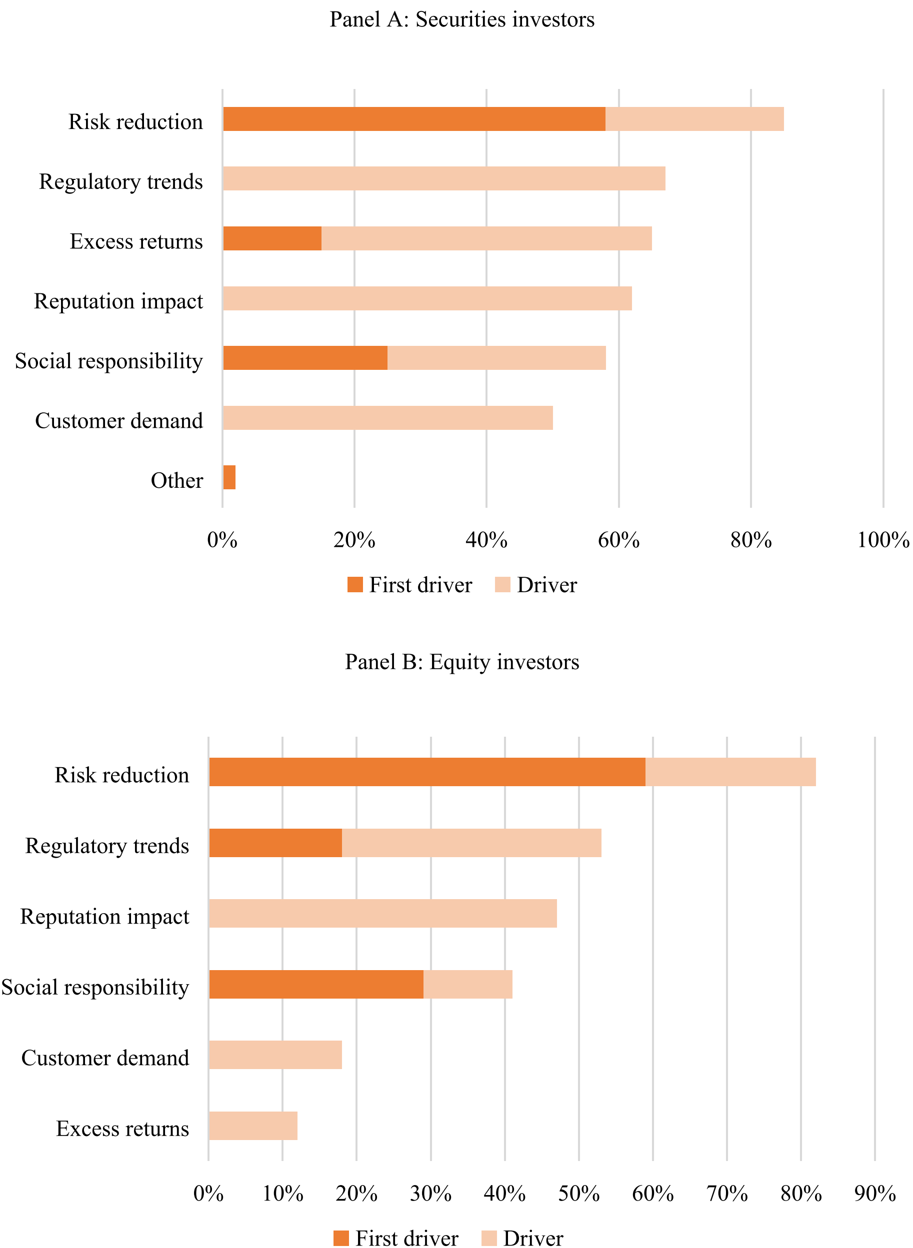

Fig. 7. Drivers motivating institutional investors to engage in ESG/green investment Data Source: Asset Management Association of China (2020a; 2020b).

performance, stock market and impact are popular topics. Furthermore, the majority (96%) of ESG-related articles adopt quantitative research methods, while interviews (2%) and case studies (2%) are rarely used.

3.2. The Chinese literature

The Chinese articles analyzed in this paper are sourced from the China National Knowledge Infrastructure (CNKI) database. The search keywords "ESG" or "environmental, social, and governance" (in Chinese) are used to find Chinese articles published up to 31 December 2022. The following filters are applied: Chinese articles published in journals listed in the Chinese Social Sciences Citation Index (CSSCI) are included; the journal category is restricted to the fields of economics or management; and the theme is limited to ESG in China.

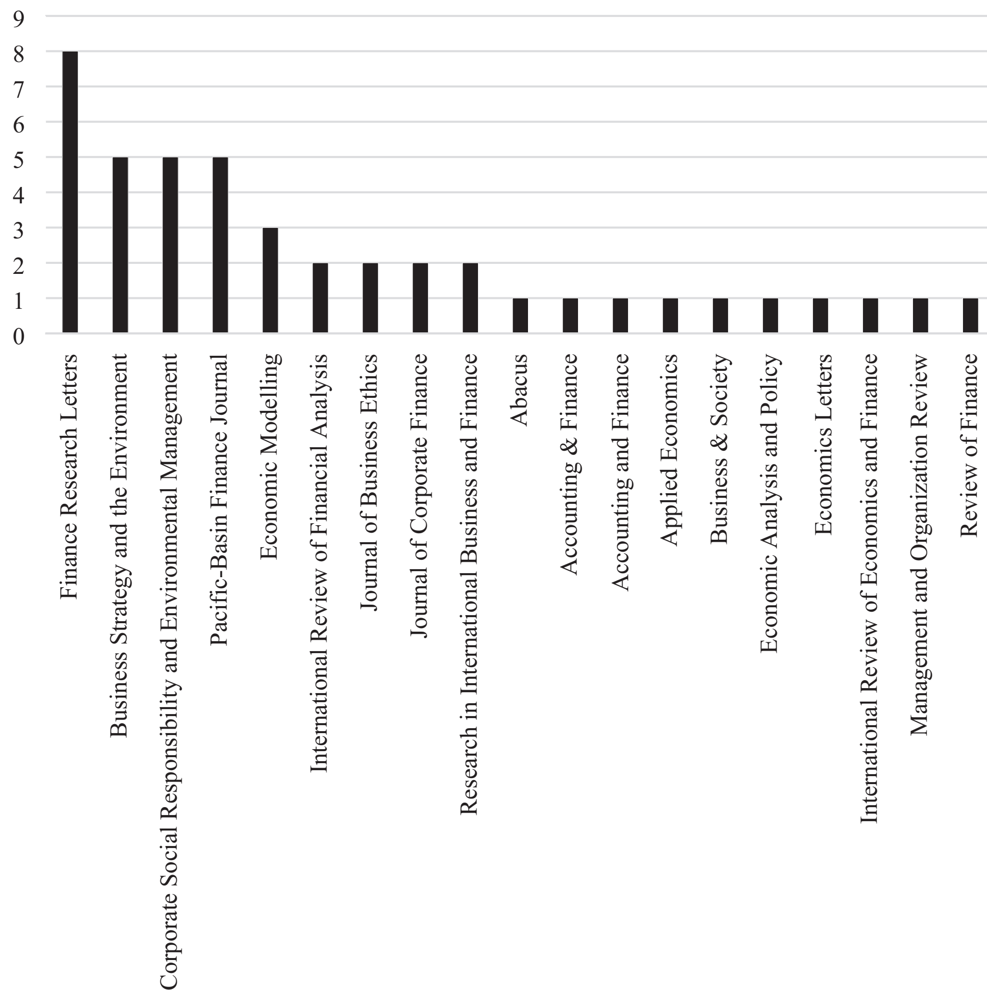

Fig. 8. The distribution of the English literature across journals.

Through this filtering process, a total of 38 relevant Chinese articles are obtained. The distribution of these articles among journals is depicted in Fig. 11. The timeline shows that these articles were primarily published between 2019 and 2023 (including several articles published online). Fig. 12 depicts the rapid growth of the Chinese ESG literature. The most frequent keywords in the Chinese ESG literature include ESG, financing constraints, sustainable development and green innovation, as shown in Fig. 13. A review of the research methods shows that all Chinese articles use archival data.

4. Research on corporate ESG disclosure in China[5]

4.1. Drivers of corporate ESG disclosure

Corporate ESG disclosure is a branch of non-financial information disclosure. The literature focuses on how companies respond to international stakeholders and compile ESG reports. Companies with international business attract attention from various international stakeholders, such as investors, customers and governments. In turn, these international stakeholders' requirements for ESG reporting and practices can induce companies to publish sustainability reports (Parsa et al., 2018).

[5] Appendix A lists the research on corporate ESG disclosure in China.

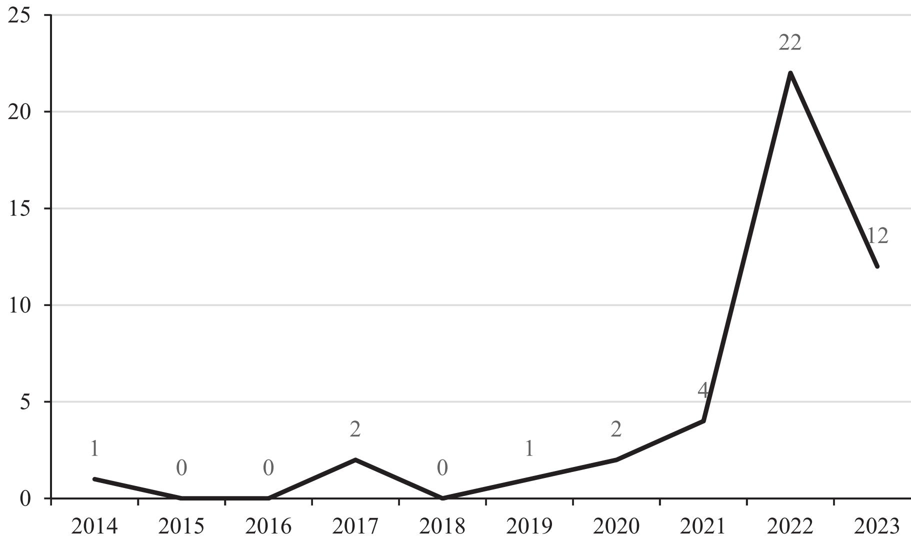

Fig. 9. The English literature from 2014 to 2023.

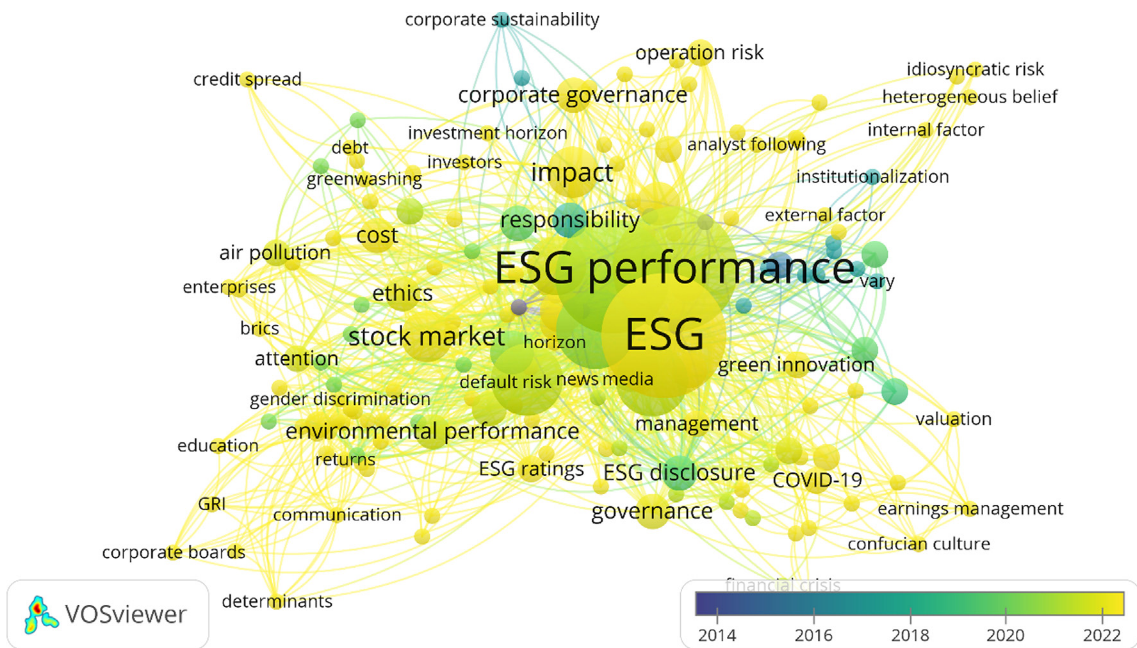

Fig. 10. Co-occurrence network of keywords in the English literature.

Marquis et al. (2017) use China Ocean Shipping (COSCO) as a case study to examine how foreign stakeholders drive Chinese companies to adjust their ESG practices and publish sustainability reports. Regarding GRI standards, COSCO identifies key sustainability issues, defines the report's boundaries and establishes an ESG database compatible with international standards. Based on these initiatives, COSCO develops a guide for future sustainability reports. Nevertheless, Yang et al. (2021) find that when Chinese companies apply GRI standards in response to international stakeholders' concerns, they do not gain a competitive advantage in international markets compared with those in the domestic market. They argue that when Chinese companies enter foreign markets, they face more intensive social and environmental regulatory requirements from vari-

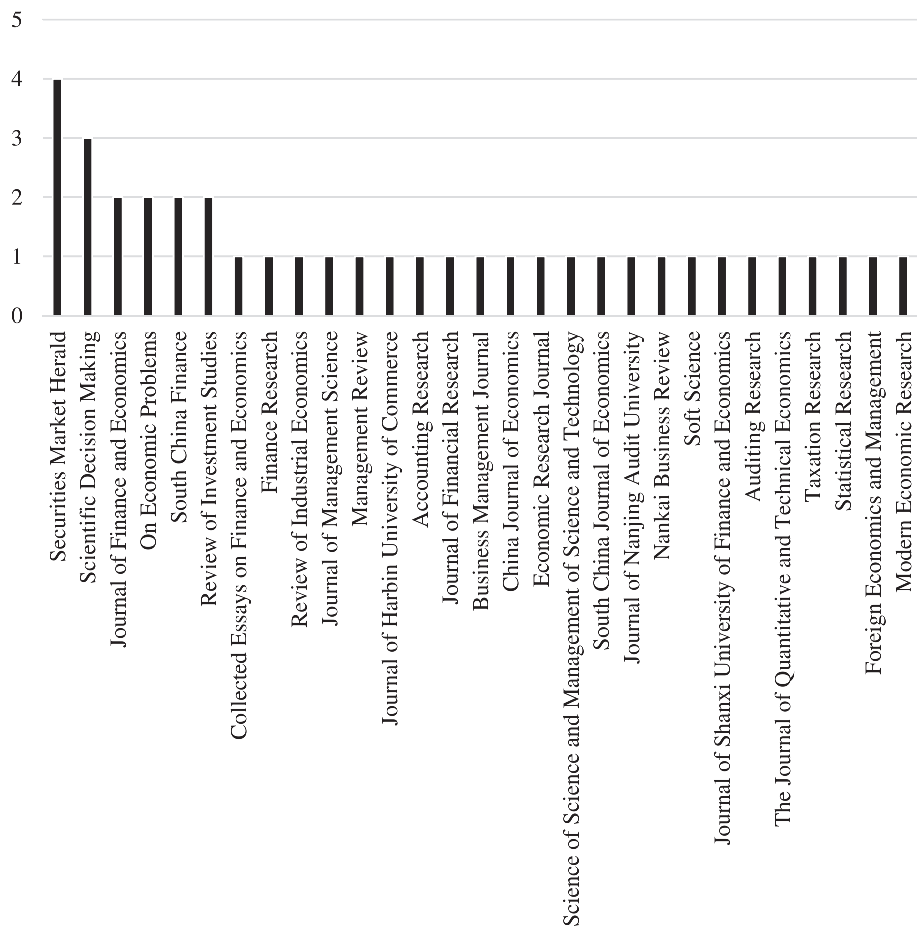

Fig. 11. The distribution of the Chinese literature across journals.

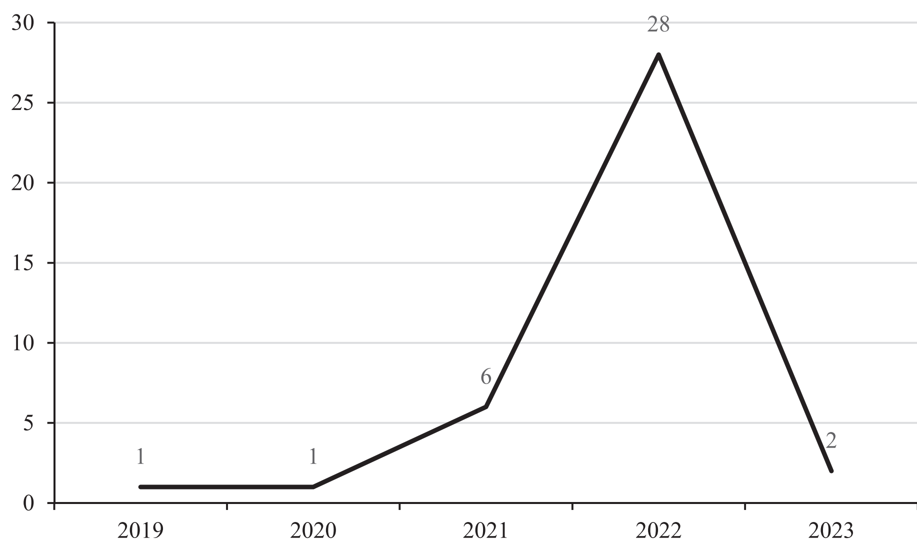

Fig. 12. The Chinese literature from 2019 to 2023.

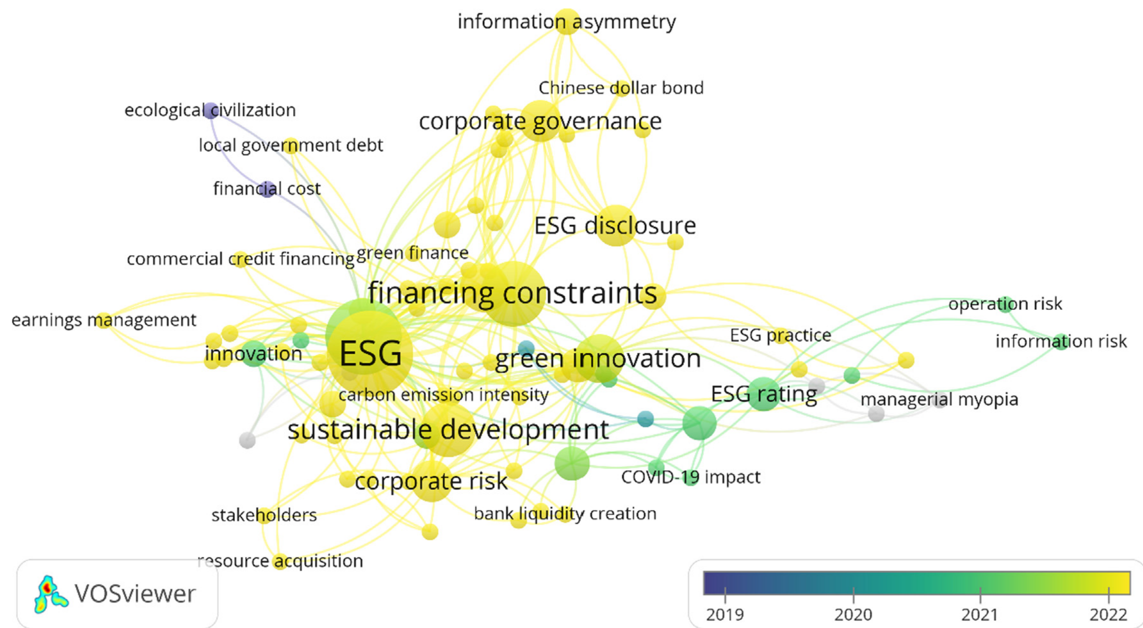

Fig. 13. Co-occurrence network of keywords in the Chinese literature.

ous stakeholders, such as host country governments, foreign customers and non-governmental organizations. Compliance with GRI standards alone does not guarantee support from international stakeholders.

4.2. Economic consequences of corporate ESG disclosure

Research on the economic consequences of ESG disclosure among Chinese companies primarily concentrates on its impact on corporate operational activities and capital market performance. Overall, previous studies show that ESG disclosure has a positive effect on corporate operations and reduces information asymmetry in the capital market.

Concerning the impact on corporate operational activities, Chen and Xie (2022) find, based on the first release of ESG ratings by Bloomberg, that ESG disclosure has a positive effect on corporate performance, especially in companies with ESG investors, longer established companies, those receiving more media attention and those with higher agency costs. Yang et al. (2021) examine the first application of GRI standards and document that companies that apply GRI standards achieve better than expected performance. Li et al. (2022c) discover that ESG disclosure can significantly alleviate corporate financing constraints, and that positive news plays a moderating role. Li et al. (2022b) find a U-shaped relationship between ESG disclosure and the green innovation of heavily polluting companies. When the degree of ESG disclosure is low, the costs of information production and transmission outweigh its positive effects, thus decreasing the degree of corporate green innovation. However, when the degree of ESG disclosure is high, the positive effects can offset the negative effects resulting from costs.

Concerning corporate capital market performance, Xi and Wang (2022) find that ESG disclosure can mitigate stock price crash risk by reducing information asymmetry and minimizing investor emotions. He et al. (2022b) confirm that ESG disclosure provides additional non-financial information that reduces information asymmetry, significantly lowering companies' idiosyncratic risk. This effect is primarily concentrated in companies that are subject to mandatory ESG disclosure.

In the bond market, Wu et al. (2022) find that when Chinese dollar bonds disclose ESG information (i.e., as rated by Bloomberg), the bond issuance spread decreases by an average of 59 basis points. The higher the ESG disclosure scores, the smaller the issuance spread of Chinese dollar bonds. Zhang and Liu (2022) suggest that

companies with relatively high ESG disclosure scores reduce information asymmetry between bond issuers and investors, significantly decreasing the value at risk of corporate bonds.

4.3. Quality of ESG disclosure

Sun et al. (2022) discuss the quality of corporate ESG disclosure from the perspectives of readability and conciseness. They suggest that GRI-compliant ESG reports are lengthier than other ESG reports, because GRI-compliant ESG reports typically contain more information to fulfill the demands of various stakeholders. Moreover, compared with other ESG reports, GRI-compliant ESG reports generally have lower readability, due to a lack of integration between non-financial and financial information.

5. Research on corporate ESG performance in China

5.1. Driving factors of corporate ESG performance

The driving factors are of two types: external factors, such as regulations, government behaviors and market power, and internal factors, such as ownership structure, corporate governance and digitalization. Appendix B lists the research on the drivers of corporate ESG performance in China.

5.1.1. External factors

The Chinese government adopts a top-down approach in addressing environmental issues, by means of environmental regulations. Investigations into the influence of regulatory policies on ESG performance reflect the top-down institutional framework in China. Specifically, these studies help us trace the chain of effects from institutions at the country level to ESG performance at the company level.

Previous studies explore the impact of low-carbon and environmental policies on corporate ESG performance. For instance, the National Development and Reform Commission launched low-carbon city pilot programs in 2010, 2012 and 2017. These pilot programs requires the government involved to develop policies to promote low-carbon development and accelerate the creation of a low-carbon industrial system. Wang and Wang (2022) discuss the impact of this policy on high-quality development (as measured by ESG) and find a positive relationship between them. Wang et al. (2021) suggest that China's environmental protection tax enhances corporate ESG performance, primarily by encouraging green innovation to improve environmental performance. Wang et al. (2022b) find that central environmental protection inspection enhances corporate ESG performance, by reinforcing corporate environmental compliance, strengthening connections between companies and stakeholders, and alleviating agency conflicts between managers and shareholders. Shu and Tan (2023) focus on the need for the low-carbon transformation of Chinese companies in the context of the "dual carbon" goal, exploring the relationship between carbon control policy risk and corporate ESG performance. They argue that regulations for carbon emissions could cause high-carbon companies to face extra compliance costs, leaving insufficient funds to support ESG activities. They accordingly discover a negative correlation between carbon control policy risk and corporate ESG performance, particularly in companies that are non-state-owned, insensitive to green innovation, in carbon-sensitive industries or located in regions with strict environmental regulations.

In addition to environmental regulations, government behaviors also have an impact on corporate ESG performance. Zhang and Deng (2022) explore the crowding-out effect of government debt on corporate ESG performance. They find that government debt crowds out credit resources, increasing corporate financing costs and diminishing financial support for green governance. Such a crowding-out effect leads to a significant decrease in corporate ESG performance. Meng et al. (2023) find that the collusion interaction of government and companies hinders corporate ESG practices, thus aggravating air pollution.

Research on the impact of market power mainly focuses on three market participants: non-governmental organizations (NGOs), institutional investors and emerging financial market participants such as big-tech companies.

NGOs are intermediaries in information transmission, encouraging and guiding corporate ESG practices. Such NGOs can help companies collaboratively resolve ESG-related conflicts. They can also leverage their

monitoring and communication advantages to impact companies, leading to changes in corporate ESG behaviors (Moosmayer et al., 2019).

Moosmayer et al. (2019) investigate the relationships among companies, NGOs and consumers. They find that while consumers cannot confirm the credibility of sustainable products through trial use, they can alleviate their doubts about credibility through NGO propaganda and third-party certifications. Studying consumers' purchasing intentions for a sustainable athletic product from Li Ning, the authors find that the interaction between Li Ning and two NGOs (the Institute of Public and Environmental Affairs and the Natural Resources Defense Council) served as a signal to consumers. This signal can enhance the credibility of sustainability claims associated with the product, increasing support from consumers.

A number of studies discuss the differential impact of institutional investors on corporate ESG performance. Jiang et al. (2022) find that site visits by institutional investors can significantly improve companies' ESG performance, primarily through enhancing the quality of accounting information, increasing environmental investment and increasing media attention. Liu et al. (2023) differentiate institutional investors into pressure-sensitive and pressure-resistant types. They find that pressure-resistant institutional investors, who focus on long-term corporate interests, enhance corporate ESG performance across all three ESG dimensions, while pressure-sensitive investors driven by short-term interests reduce corporate ESG performance in the environmental and governance dimensions. Wang et al. (2023a) categorize institutional investors into four categories: long-term pressure-sensitive, long-term pressure-resistant, short-term pressure-sensitive and short-term pressure-resistant. They find that the positive correlation between institutional investors and ESG performance is mainly driven by long-term pressure-resistant and short-term pressure-sensitive institutional investors.

Chinese big-tech companies have become important players in the financial market through digital finance. Mu et al. (2022) find that digital finance can boost corporate ESG performance by easing financing constraints. This benefit is more pronounced in companies that are non-state-owned, small-sized, at a lower level of marketization or located in the central and western regions of China; that is, digital finance alleviates the financing challenges faced by disadvantaged companies. Yang et al. (2022) draw similar conclusions and argue that this promotion effect is mainly achieved through financial and technical support.

5.1.2. Internal factors

Previous research on the internal factors influencing corporate ESG performance mostly focuses on ownership structure, corporate governance and level of digitalization.

State-owned enterprises (SOEs) tend to engage in a higher level of ESG practices compared to non-SOEs. As a unique subset of Chinese companies, SOEs are supervised by the State-owned Assets Supervision and Administration Commission. Under state policies (such as environmental and sustainable policies), SOEs are required to engage in ESG practices (Zhang and Huang, 2022). Some studies highlight the pioneering role of SOEs in driving ESG practices. Weber (2014) finds that a higher percentage of SOEs than non-SOEs publish ESG reports. Distinguishing between central and local SOEs, Lin et al. (2021) argue that central SOEs place a higher emphasis on the social benefits of their activities. They are more willing and able to engage in ESG activities than other types of SOEs or non-SOEs.

Regarding corporate governance, Huang et al. (2022) focus on the widespread issue of controlling shareholder pledging in Chinese companies. The authors demonstrate that after controlling shareholders pledge their equity, they are motivated to exploit small and medium-sized shareholders and obtain earnings. As a result, corporate ESG performance significantly deteriorates. Qiu et al. (2022) find that corporate social trust has a positive impact on ESG performance, and it is boosted by the presence of female directors on executive teams. Liu et al. (2022a) find that CPC governance positively influences corporate ESG performance. Because the board of directors plays such an important role in corporate decision-making, the inclusion of Party members on the board boosts ESG performance more than inclusion in executive teams.

Regarding corporate digitalization, Fang et al. (2022) investigate how companies' digitalization level drives ESG performance. In addition, corporate communication technologies can reduce agency costs, in turn improving the governance score. Companies use digital communication tools to connect with stakeholders. By sharing their accomplishments in philanthropy and poverty reduction, companies can strengthen their social reputation and obtain a higher social score. However, digital technologies do not significantly impact

their environmental score. Similar findings are reported by Wang et al. (2023b) and Hu et al. (2023), who suggest that digital strategies and blockchain technology can significantly enhance ESG performance.

5.2. Economic consequences of corporate ESG performance

Many studies investigate the economic consequences of ESG performance among Chinese companies. This section summarizes the impact of ESG performance on corporate value, corporate operations, financing activities and investment. Appendix C summarizes the research on the economic consequences of corporate ESG performance.

5.2.1. Impact of ESG performance on corporate value

Whether ESG performance can affect corporate value is a popular topic in ESG research. Discussions of corporate value mainly involve corporate operational and stock market performance.

Most studies show that ESG performance is positively related to corporate value. There are three mechanisms at work. First, ESG helps reduce information asymmetry and lower financing costs (Wang and Yang, 2022; Xi and Zhao, 2022). Second, ESG can improve corporate profitability and productivity, because it sets high standards for human capital, managerial skills and technical expertise (Zhou et al., 2021; Li et al., 2021). Third, it decreases operational risks. ESG assists companies in establishing a positive image, which has the potential to improve corporate value (Zheng et al., 2023b; Tan et al., 2022; Xi and Zhao, 2022). Of these three mechanisms, Wang et al. (2022a) indicate that the risk-reducing effect is the most crucial. Low operational risks help companies with good ESG performance gain government resources, strengthen supply chain partnerships and acquire financial resources.

However, some researchers find that the relationship between ESG performance and corporate value varies across different industries, competitive strategies and periods of ESG implementation. According to Wang et al. (2022d), there is a U-shaped relationship between industrial companies' ESG performance and financial performance. This relationship is more pronounced in companies that implement differentiated strategies. According to Li and Zheng (2022), ESG is not yet able to increase corporate income growth in China because it is still in its infancy. Hence, the cost of ESG is more noticeable than the positive effect. According to Yi et al. (2022), ESG practices reduce short-term corporate value while increasing it in the long term.

In terms of stock market performance, researchers primarily examine whether companies with higher ESG ratings achieve significant excess returns compared with those with lower ESG ratings. Research to date presents inconsistent conclusions. The majority of studies support the claim that companies with high ESG ratings achieve significant excess returns. Chen et al. (2023a) find that stocks with high ESG scores perform better than those with low ESG scores. This ESG premium is mainly due to insufficient market reactions to ESG information rather than risk compensation. Li (2021) and Zhou et al. (2021) obtain similar results. However, some studies obtain more mixed findings. Feng et al. (2022b) suggest that companies with higher ESG performance can achieve significant excess returns in the short term, but their long-term stock returns diminish as investor attention to ESG wanes. Zhang et al. (2021) find that after the issuance of *Guidelines for Establishing the Green Financial System* in 2016, companies with higher ESG performance had significant excess returns compared with companies with lower ESG performance. Lo and Kwan (2017) examine the market reactions to news reports on different topics and find that because ESG has a more clearly defined scope than sustainability, ESG-related news receives more positive market responses.

Some researchers examine whether companies with higher ESG performance achieved better returns during the COVID-19 pandemic in China. The results consistently demonstrate the significance of ESG performance in times of crisis. Broadstock et al. (2021) use the lockdown event in Wuhan as a shock and find that high-ESG portfolios generally outperformed low-ESG portfolios, suggesting that ESG was used to mitigate financial risk during the market-wide financial crisis caused by COVID-19. However, the marginal benefit of ESG performance on returns is diminished in normal times. Shan and Tang (2023) identify employee satisfaction as a crucial index of ESG. They find that companies with high employee satisfaction achieve significant and positive excess returns, despite the COVID-19 pandemic. This effect is more pronounced in companies with more intangible assets and in knowledge-based industries, meaning that the impact of employee satisfaction on

stock returns is more significant in human capital-intensive companies. Their research supports the idea that companies that do well in normal times can also perform well in times of crisis.

5.2.2. Impact of ESG performance on corporate operations

The influence of ESG performance on corporate operations is primarily reflected in motivating innovation and enhancing productivity. In addition, some studies examine the impact of ESG performance on business management from other perspectives, such as financialization and auditing.

Innovation and productivity are key drivers of corporate growth. Previous research investigates the relationships among corporate ESG performance, innovation and productivity. Regarding innovation, Lin et al. (2021) argue that corporate ESG activities can improve the relationship between companies and stakeholders, which helps companies obtain a range of external knowledge and financial support, thus encouraging innovation. Zhai et al. (2022), Li et al. (2023) and Zheng et al. (2023a) also find a positive relationship between ESG performance and innovation (or specifically green innovation). However, Liu et al. (2022b) use the first release of SynTao ESG ratings as a shock to study whether market pressure can push companies toward green innovation. The results show that ESG significantly boosts the quantity of corporate green innovation instead of its quality, reflecting the opportunistic behavior of managers.

Regarding productivity, Deng et al. (2023) show that ESG is conducive to improving total factor productivity. Sheng et al. (2022) find that ESG performance can boost the total factor productivity of family businesses. They show that the impact is more pronounced when family businesses are at a higher level of marketization, are operating within periods of growth and maturity or are controlled by the first generation.

The influence of ESG on other aspects of corporate management has also been explored. For instance, Pan et al. (2022) find that ESG inhibits firm financialization, and He et al. (2022a) observe that it can deter improper managerial conduct. Xiao et al. (2021) discover that ESG ratings of listed companies can significantly reduce audit fees. Song et al. (2022) provide evidence on ESG practices in the banking industry. They find that banks' ESG spending significantly promotes liquidity. Externally, ESG spending is an important tool for managing banks' reputations, reducing financing costs and alleviating regulatory pressure. Internally, ESG spending can enhance banks' capacities for governance and risk management.

5.2.3. Impact of ESG performance on corporate financing activities

ESG performance primarily influences corporate financing by alleviating financing constraints and enhancing financing efficiency. Discussions of ESG performance in both the bond and stock markets are also critical to corporate financing activities.

Previous studies confirm that ESG significantly alleviates financing constraints and enhances financing efficiency (Qiu and Yin, 2019; Li et al., 2022a; Lai and Zhang, 2022; Chen et al., 2023b). Long and Ou Yang (2022) approach the topic from the perspective of capital structure, discovering that an improvement in corporate ESG performance attracts more financial support from investors, thus optimizing the capital structure for the current and next periods. Media attention to ESG also plays an important role in mitigating the corporate cost of debt. For instance, *Southern Weekly*, the first nationally recognized media outlet to cover ESG topics, publishes annual lists of the 100 "best corporate social responsibility firms" according to ESG performance. Gao et al. (2022) review these ESG lists and find that the media spotlight on ESG significantly decreases the corporate cost of debt. Similarly, Tian and Tian (2022) and Li and Feng (2022) show that better ESG performance is associated with lower informational and operational risks, which further increases corporate trade credit.

Regarding the bond market, Li et al. (2022e) find that companies with higher ESG ratings have lower default risk, and this effect intensifies as bonds increase in maturity. Xu et al. (2022) identify a "greenwashing" phenomenon in China's green bond market, which leads to higher credit spreads for green bonds than traditional bonds. However, ESG ratings can provide non-financial information related to bonds, effectively reducing the credit spreads of green bonds.

Research shows that ESG can reduce companies' stock price crash risk (Feng et al. 2022a; Shuai, 2022), improve the accuracy of analysts' predictions (Luo and Wu, 2022) and increase the proportion of shares held by institutional investors (Zhou et al., 2020). Fu et al. (2020) specifically explore the effects of ESG practices in gambling companies in Macau. They find that four government initiatives related to ESG (an anti-corruption

campaign, visa restrictions, smoking bans and responsible gambling) lead to a significant increase in the institutional ownership of casino companies in general, demonstrating the presence and mechanism of responsible investing in "sin" industries. Further results show that norm-constrained institutions (e.g. pension funds) are prominent responsible investors, whereas natural arbitrageurs (e.g. mutual and hedge funds) do not undertake any significant role in this regard.

5.2.4. Impact of ESG performance on corporate investment

In terms of corporate investment, ESG performance can affect the efficiency of both domestic and foreign investment. Gao et al. (2021) find a positive relationship between ESG performance and overall investment efficiency. On the one hand, ESG alleviates overinvestment by reducing agency problems. On the other hand, ESG reduces underinvestment by reducing agency costs and alleviating financing constraints. Xie and Lv (2022) argue that ESG is a key driver of foreign direct investment, which helps companies gain competitive advantages, such as green innovation and brand reputation. They consequently find that strong ESG can increase the likelihood and scale of foreign investment by listed companies. These advantages help companies not only reduce the cost of foreign financing, but also overcome disadvantages in dealing with different ESG requirements in host countries.

6. Research on ESG investing in China

Scholars have investigated whether ESG investing, as an investment philosophy, can yield excess returns from the perspective of investors. Only a few studies consider the Chinese setting, as shown in Appendix D. In addition, because ESG investment is based on the ESG assessment of companies by financial institutions or third-party agencies (i.e., ESG rating agencies), divergence in ESG ratings has also attracted attention from academia (Li et al., 2022d).

Gao et al. (2020) use national air pollution data to examine the benefits of responsible investment in China. They find that investors' pessimistic sentiments on days with severe air pollution have a negative impact on the stock returns of A-shares, while stocks in the Responsible Investment Index perform better during the same period.

Li et al. (2022d) quantify the uncertainty behind ESG data and propose a robust enhanced indexation model for ESG investment. As global extreme weather intensifies, institutional investors tend to incorporate ESG into their sustainable investment portfolio or portfolios that hedge against climate risk. Against this backdrop, the authors demonstrate that embedding ESG in the enhanced indexation model leads to higher returns and lower risk.

Because ESG ratings are an effective tool for assessing the sustainability of companies and financial products, divergence in ESG ratings has sparked international discussion (Chatterji et al., 2016; Christensen et al., 2022). Divergence in ESG ratings also occurs among Chinese companies. Li et al. (2022d) find divergence in the ratings of three Chinese ESG rating agencies, namely SynTao, CASVI and Huazheng. The authors argue that this divergence affects the willingness of companies to improve their ESG performance. Investors will also suffer substantial investment losses if they apply investment models without considering ESG rating divergence.

7. Characteristics of ESG research in China

This section discusses two characteristics of ESG research in China. First, the research reflects the unique institutional context in China. Second, it mainly adopts quantitative research methods and uses ESG ratings provided by third parties as proxies for ESG performance.

7.1. Unique institutional context

Chinese ESG research is deeply embedded in its institutional context (Cheng et al., 2022; Lennox and Wu, 2022), in particular the top-down institutional framework, differences in corporate ownership structure and increasing interaction between the mainland and Hong Kong capital markets.

First, the development of ESG reflects the top-down institutional framework in China. The 18th National Congress of the CPC incorporated environmental concerns into the Five-Sphere Integrated Plan[5] in 2012; since then, a series of environmental policies have increased companies' awareness of sustainable development and environmental initiatives (Wang et al., 2021; Wang and Wang, 2022; Wang et al., 2022b), thus promoting their ESG practices. For example, in 2016, the People's Bank of China and six other ministries jointly issued the *Guidelines for Establishing a Green Financial System*, which proposed a shift toward ESG investing (Zhang et al., 2021; Li et al., 2022d; Song et al., 2022).

Second, SOEs are at the forefront of corporate ESG practices in China. SOEs are more actively involved in implementing national policies (Weber, 2014; Zhang and Huang, 2022), and their ESG practices are in line with China's national policies, which help to improve China's image on the international stage (Marquis et al., 2017). There are, however, differences in ESG practices between central SOEs and local SOEs (Lin et al., 2021). Central SOEs prioritize furthering social goals and are more equipped and motivated than local SOEs to implement national strategies and policies.

Third, there has been increasing interaction between the capital markets in mainland China and Hong Kong. The CSRC and the Hong Kong Securities Regulatory Commission issued joint announcements to launch the Shanghai–Hong Kong Stock Connect and Shenzhen–Hong Kong Stock Connect in 2014 and 2016, respectively. These actions have promoted market liberalization and the coordinated development of the two markets. Furthermore, the ESG disclosure of listed companies on the Hong Kong Stock Exchange has gradually shifted from voluntary to semi-mandatory to mandatory, driving the ESG disclosure of A-share listed companies in China. The increasing connection and interaction between the two capital markets yields unique research scenarios for ESG research in China.

7.2. Methods and data in Chinese ESG research

The majority of ESG-related articles on China adopt quantitative research methods (98%), while interviews (1%) and case studies (1%) are rarely employed. There is a lack of experimental research methods in ESG studies. However, interviews, case studies and other qualitative methods are essential supplements to the existing research. For example, Marquis et al. (2017) and Moosmayer et al. (2019) use case study methods and interviews respectively to reveal how different participants engage in ESG practices. In addition, Moosmayer et al. (2019) apply psychological methods to measure corporate ESG practices and customer behaviors, providing an interdisciplinary perspective.

Self-constructed ESG indices are rarely employed in ESG-related articles (10%), and typically only in articles published before 2021; more recently, with the emergence of relevant databases, researchers have shifted to adopting professional ESG rating data (77%). The top three ESG rating agencies most frequently used in ESG-related articles are Huazheng (35%), Bloomberg (22%) and SynTao (12%). While ESG rating data are mainly adopted to measure corporate ESG performance, a few studies use ESG ratings as a proxy for corporate ESG spending.

8. Conclusions and future avenues for ESG research in China

This review of the development of ESG practices and research in China has revealed a number of insights. First, mirroring the top-down framework in China, Chinese ESG practices have grown substantially in terms of ESG disclosure, ESG rating and ESG investing. Second, research on ESG in China has focused on corporate ESG disclosure and performance as well as ESG investing. Although the topics of the ESG studies reviewed in this paper are similar to those of ESG research in other countries, China's ESG research enriches international ESG research by showing two distinct characteristics, namely, the country's unique institutional context and the dominance of quantitative research methods. This section proposes the following three avenues for future research: the impact of the interaction between traditional Chinese ethics and the country's

[5] The Five-Sphere Integrated Plan refers to China's overall plan for building socialism with Chinese characteristics—that is, to promote coordinated progress in the economic, political, cultural, social and environmental fields.

modernization on corporate ESG, the impact of the internationalization of Chinese business on ESG, and the development of China's ESG standards.

8.1. Impact of traditional Chinese ethics and modernization

ESG aligns with traditional Chinese ethics, which involves the pursuit of harmony among humanity, nature and society. For example, traditional Chinese ethics emphasizes ecological philosophy and holds that "man is an integral part of nature"; this coincides with the call for environmental management and resource conservation in ESG. Just as Chinese ethics upholds the principle of pursuing profits in the right and proper ways, modern companies undertake social responsibility duties and attempt to promote social welfare. Chinese ethics holds that "the greatest ideal is to create a world truly shared by all," which provides a reference point for the governance of modern companies. However, few studies have linked the ESG practices of Chinese companies with traditional Chinese ethics. Future research could explore the relationship between traditional ethical values and corporate ESG, and whether this relationship varies with different cultural characteristics, regions and industries.

The modernization of China has also shaped the unique ESG practices of Chinese companies. For example, under the rural area revitalization strategy, Chinese companies boost the economic development of villages using local resources, further increasing industrial competitiveness and improving basic public services. These initiatives not only contribute to the social component of ESG but also help fulfill the Sustainable Development Goals of zero hunger and no poverty. A few existing studies discuss the relationship between China's modernization and the ESG of Chinese companies (Wang et al., 2021; Wang et al., 2022b, 2022e). However, these studies may not fully capture how social and economic modernization shapes corporate ESG disclosure and ESG performance in China. Moreover, considering that ESG disclosure in China is still mainly voluntary, future research could focus on the quality of ESG disclosure, such as the role and development of ESG assurance, and the risks associated with ESG disclosure, such as litigation risk.

8.2. Impact of the internationalization of Chinese business

Chinese companies' internationalization encourages their compliance with overseas ESG practices. In this way, Chinese companies improve their competitiveness through considering host countries' employment systems, local procurement, community support and environmental protection requirements. A number of topics thus need to be addressed in the literature, such as how international stakeholders influence the overseas ESG practices of Chinese companies; whether this relationship varies across different industries and countries; and how overseas ESG practices assist Chinese companies' adaptation to the value system of host countries and especially promote their investment in the Belt and Road region.

How the overseas ESG practices of Chinese companies affect their domestic ESG practices is an emerging topic. It is worth investigating whether the international ESG practices of Chinese companies change their domestic ESG practices, and how overseas investors view the ESG performance and disclosure of Chinese companies.

In addition, little is known about the ESG practices of multinational companies in China. According to data from the Ministry of Commerce, China's utilization of foreign capital in 2022 amounted to RMB1.23 trillion, with an increase of 6.3% year-on-year in comparable terms. Thus, it is crucial to examine the ESG practices of multinational companies in China. Future research could discuss how multinational companies practice ESG to obtain legitimacy in China, and whether ESG practices vary with different parent countries and different industries.

8.3. Development of China's ESG standards

Whether to develop independent ESG standards reflecting China's institutional environment or to adopt international standards remains a controversial issue. Some propose that it is useful to adopt ESG standards that incorporate China's unique ESG practices, such as the rural area revitalization strategy, as this helps enhance China's global influence. However, others argue that the adoption of international ESG standards

can increase the comparability of ESG information disclosed by Chinese companies and reduce the cost of preparing reports for cross-border listed companies. A major challenge for regulators is to strike a balance between these two considerations. Future research should adopt diverse research methods and explore the perspectives of various stakeholders, to provide a clear roadmap for ESG practice in China.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendices. Supplementary data

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