ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 5, No.2, pp. 81-106,
May-August 2024

doi: 10.14456/rjcm.2024.12
Received 11.05.24/ Revised 14.08.24/ Accepted 21.08.24

The Influence of Environmental, Social and Governance (ESG) Ratings on Credit Ratings: A Case Study of Chinese Listed Companies

Fantong Gao[1*]
Xuegang Zhan [2]

[1,2] Graduate Program in Creative Industries Management
Rattanakosin International College of Creative Entrepreneurship
Rajamangala University of Technology Rattanakosin, Nakhon Pathom, Thailand
* Corresponding author
[1] Email: gao.fantong@outlook.rmutr.ac.th
[2] Email: lilisan666@ctbu.edu.cn

Abstract

This research, utilizing empirical data from firms listed on China's CSI 800 Index between 2019 and 2021, explicates the connection between Environmental, Social and Governance (ESG) performance and corporate credit ratings. Significant positive correlation was found, which is further influenced by the size, financial condition and nature of the enterprises. Larger enterprises are more inclined to achieve superior ESG ratings and credit rankings. A robust financial standing facilitates easier investment in ESG initiatives, leading to an enhancement in credit ratings. The ESG performance was found to have a more pronounced effect on the credit ratings of non-state entities, with state-owned firms leaning more toward governance. The obtained findings provide an insightful contribution to the improvement of ESG performance, enhance credit ratings, and foster sustainable development. These can help fill in the empirical research void in the domestic context, support policy formulation and advance the infrastructure for persistent ESG evaluation.

Keywords: *ESG (Environmental, Social, and Governance), corporate credit ratings, sustainable development*

1. Introduction

1.1 Research Background

In recent years, the impact of Environmental, Social, and Governance (ESG) criteria on credit ratings has been increasingly noticed, largely being driven by the Principles for Responsible Investment (PRI) suggested by the United Nations. In 2016, the

PRI initiated the ESG Credit Risk and Ratings Initiative (United Nations Principles for Responsible Investment (PRI) (2016), prompting credit rating providers to incorporate ESG considerations into their analyses. Sustainable development regulations were put into place at the UN COP2015 Climate Summit in Glasgow in 2021, compelling regulators and investors to set stricter demands for businesses in the context of Corporate Social Responsibility (CSR) and ESG issue.

Rating agencies have started to contemplate on how to integrate ESG factors into credit decision-making processes to identify premium opportunities to mitigate risk or establish more sustainable future business prospects. Renowned rating agencies, such as Standard & Poor's, Moody's, and Fitch have all agreed to the PRI statement on ESG in credit risk and ratings. As signatories, they're committed to "methodically and openly incorporate ESG into credit ratings and analyses" (S&P Global Ratings, 2019).

In China, regulatory authorities have actively encouraged ESG investments and necessary information disclosure procedures, leading to an improved ESG rating system. Concurrently, investors have become increasingly attuned to ESG-related investment information.

A comprehensive research body has studied the association between ESG ratings and credit ratings, and their effects on credit risk. Studies suggest that corporations with high ESG scores often demonstrate superior financial performance and higher credit ratings (Wang, Zhang, & Li, 2021). Certain researchers are primarily investigating the utilization of ESG ratings in the credit rating process by analyzing how to increase the precision and breadth of credit ratings through ESG factors (Liu, Zhang, & Liu, 2020). As consistent with the data from the 2021 "White Paper on ESG Development of Chinese Listed Companies," until June 2021, 1112 of A-share listed companies released ESG-related reports, a significant surge from 371 in 2019. This exemplifies the majority of listed companies' robust ESG disclosure awareness, and that these companies are persistently pressing for the enhancement of long-term corporate value through improving their ESG performance. Consequently, empirical research into the relationship between ESG ratings and credit ratings, using Chinese listed companies as a model, is crucial to grasp the sustainable development and credit risk of these firms.

1.2 Research Objectives

The research objective was to investigate the impact of ESG (Environmental, Social, Governance) ratings on the credit ratings of publicly listed companies within the Chinese context. There has been a growing trend among corporations to undertake environmentally and socially sustainable actions and align governance strategies that resonate with stakeholder interests. It is, therefore, incumbent upon companies to balance both the pursuit of maximizing shareholder wealth and acting in a socially responsible manner.

This study also aimed to enhance the body of literature concerning the interplay between ESG performance and credit ratings of companies listed in China. The researchers sought to offer an empirical elucidation of these complex relationships. Furthermore, a detailed evaluation of the relationship between the three factors that constitute ESG--environmental stewardship (E), social responsibility (S), and governance adequacy (G)--and corporate credit ratings as integral to relevant ESG rating factors within the framework of China's credit rating system.

Through this empirical exploration, the researchers aspired to deliver a comprehensive understanding of the relationship between ESG scores and the credit ratings of Chinese listed corporations. It was expected to obtain insights into ESG performances and credit ratings to benefit investors, financial institutions, and policy-makers alike.

1.3 Research Questions

The central research question of this study was on the impact of ESG (Environmental, Social, Governance) ratings on the credit ratings of publicly listed firms within the Chinese context. This also includes an assessment of the degree to which ESG ratings influence credit ratings.

Within the context of corporate ESG ratings, the researchers expected to unravel the nature of the relationship between the three core components of the ESG performance assessment—Environmental Stewardship (E), Social Responsibility (S), and Governance (G)—and the credit ratings of the respective firms.

As for the Chinese publicly listed firms, the study was to investigate factors, such as the size of the company, financial condition, and the nature of the corporation (state-owned or non-state-owned) whether they mediate or modify the relationship between ESG scores and credit ratings.

1.4 Significance of the Study

The obtained findings were to generate practical implications for improvement in companies' ESG performance, enhancement of credit ratings, and sustainability of business development. Potentially, they could serve as a valuable reference for the planning and oversight of pertinent policies, contributing to the construction of a more transparent and sustainable financial system.

ESG ratings and credit ratings both encompass quantitative and qualitative assessment metrics for corporate entities. ESG encapsulates the trending movement toward green and low-carbon development, while credit ratings underscore the foundational trust and safety in contemporary commercial bank management. Incorporating relevant components of ESG ratings into the credit rating system can equip domestic financial institutions to adapt their operational practices to align with the requirements of the evolving development landscape, which serves high-quality economic development and

comprehensively aids in achieving the target goals of peak carbon emissions and carbon neutrality.

2. Literature Review and Four Hypotheses

2.1 The Relationship between ESG Ratings and Credit Ratings

ESG ratings amalgamate traditional credit rating methods and models with ESG indicators, creating a crossroads between ESG investment and traditional credit rating narrative. Rather than standard credit ratings, ESG ratings fundamentally implement the theory, techniques, and models employed in credit ratings to the ESG sector, subsequently offering a comprehensive ESG level for rated subjects in a sortable numeric or symbolic format.

Research presented by Zaidi et al. (2022) indicated the significant role of Environmental, Social, and Governance (ESG) factors in distinguishing high-credit companies from their low-credit companions, further foregrounding the necessity of ESG indicators in corporate credit evaluation. Consistent with the seminal work by Friede et al., (2015), numerous studies identified a positive correlation between ESG factors and credit risk.

Credit ratings, typically employed as a proxy for credit risk, thus signifying the likelihood of "counterparties in financial transactions failing to fulfill their obligations" (Arnold, 2008), might be upgraded or downgraded contingent on variations in corporate-related particulars. Thus, previous researchers intuitively investigated whether improved ESG performance could result in advantageous credit rating issues. If enhanced ESG performance positively influences a superior credit rating level, it implies that businesses could secure beneficial conditions for debt costs.

In a venture to analyze the Indian market, Bhattacharya & Sharma (2019a,b) drew on Bloomberg's ESG data and concluded that ESG initiatives solely left a positive print on small and medium-sized companies' credit ratings. Notably, two-thirds of the poorly-rated companies in terms of annual credit ratings in emerging markets occur due to ESG factors. JoLock (2021) demonstrated that ESG determinants could steer credit ratings by evaluating a myriad of factors and indicators in the qualitative and quantitative domains.

When the ESG elements are embedded into the credit-rating process as influencing dynamics, any downgrade could escalate the capital requirements of lenders, thus intensifying the financial risk. Untreated ESG issues could potentially engender dire consequences, such as reputational damage, conduct risk, pricing inaccuracies, and developmental challenges in business. Hence, firms proficient at navigating ESG risks inherent in their operations should theoretically maintain superior, longstanding credit statuses. Given that ESG risks constitute genuine credit risks, investors are entrusted with designing comprehensive ESG strategies to alleviate these concerns (O'Connell, 2022).

Through evaluating the Fitch ESG rating relevance score model, Gao (2021), a distinguished domestic scholar in China, studied how fluctuations in ESG factors could depict changes in a company's operational status or financial condition over time. By continuously monitoring each ESG factor of the rated entity, the forward-looking and timely nature of credit ratings can be enhanced to a certain extent. In light of these findings, the first hypothesis is proposed:

H1 Hypothesis: There exists a positive correlation between the ESG ratings and credit ratings of listed corporations in China.

2.2 The Influence of Factors within ESG on Credit Ratings

2.2.1 The Relationship between Environmental Performance and Credit Rating

Related studies indicate firms with higher ESG environmental performance scores possess more significant credit worthiness, resulting in superior credit ratings and lower credit risk premiums. Graham & Maher (2006) studied the impacts of ESG environmental elements on credit risk, elucidating that off-balance sheet environmental obligations have a detrimental effect on bond ratings. Their findings suggest that environmental obligations are considered in bond yields. However, if bond ratings are incorporated into the model, environmental responsibility information provides no additional explanatory power. Bauer & Hann (2010) affirmed the positive influence of sound environmental management on bond ratings and yield spreads. Yet, their findings reveal no general industry or sector-level effects to mitigate ESG impacts on credit risk due to significant heterogeneity within these firms, exemplified by a medium-sized Chilean utility--Guacolda Energía, armed solely with coal-fired power plants, which are progressively becoming unpopular, leading to a loss in clientele.

Dorfleitner et al. (2019) conducted research in this realm, concluding that considering social and environmental standards can enhance credit rating predictions, with firms boasting high social or environmental sustainability receiving better credit ratings. Höck (2020) and his team used credit default swap (CDS) spreads to measure the link between credit risk and the "E" (Environmental) element in ESG. The results proposed that environmental sustainability significantly influences credit risk premiums for high credit-rated, reputable companies. Furthermore, for companies with lower leverage and higher market values, this effect is pronounced; however, for small and heavily indebted companies, being green is not worth it, although they don't get penalized for sustainability.

China's People's Bank, among seven other departments, issued "Guidelines on Building a Green Financial System" on August 31, 2016, encouraging credit rating agencies to evaluate issuers' green credit records, green levels of funds raised, and the impact of environmental costs on issuers and bond credit ratings during the credit rating process. This suggests that at least the "E" factor in ESG may influence credit ratings. (China’s People’s Bank, 2016）

Given these previous findings, the researchers of the present study formulate the second hypothesis concerning environmental performance and credit ratings:

H2 Hypothesis: There is a positive correlation between environmental performance and credit ratings of listed corporations in China.

2.2.2 The Relationship between Social Responsibility Performance and Credit Rating

The majority of perspectives suggest that there is a connection between corporate social responsibility (CSR) performance and credit ratings. However, there are differing opinions. Feng et al. (2016) found that in the Chinese economic environment, whether the company is state-owned or non-state-owned, actively taking on social responsibility contributes to reducing corporate risk and enhancing credit ratings. Further research revealed that, during the 2008 financial crisis, listed companies with good CSR performance experienced a more significant reduction in corporate risk and were better equipped to resist the negative impact of the financial crisis. Studies by Oikonomou et al. (2014) showed that positive corporate social performance leads to lower bond yield rates and better credit ratings. Attig et al. (2013) and Schuitema (2018) found evidence from MSCI ESG STATS that companies with good social performance benefit from relatively higher ratings provided by credit rating agencies. Across different economic cycles, Ryana et al. (2017) found that during economic downturns, announcements of changes in credit ratings have a greater impact. Therefore, it is relevant for companies to understand whether the influence of CSR performance on credit ratings varies between economic cycles. Corporate social responsibility's relationship with credit rating has been researched in several studies, such as those by Attig et al. (2013), Jiraporn et al. (2014), and Oikonomou (2014). They found that CSR performance has a positive impact on credit ratings, but these studies focused primarily on the United States.

Not all previous studies support the positive correlation between CSR performance and corporate risk levels. Some studies show a negative correlation, with ESG factors having a neutral or negative effect on credit risks. For example, Menz (2010) found that companies with low social responsibility have higher risk premiums compared to those with high social responsibility. Zheng et al. (2020) studied the lagging CSR effects on financial performance, revealing that during economic downtimes, state-owned companies' CSR performance in the previous year significantly reduces current financial performance, which can generate risks for the company to some extent. Brammer et al. (2008) and Barnea et al. (2010), based on information asymmetry and principal-agent theories, suggested that managers may sacrifice shareholder interests for their own social reputation, overusing corporate resources for self-serving CSR activities, which increases the risks in corporate development and may even damage corporate value. Meanwhile, European literature offers differing views, as Stellner et al. (2015) found no significant relationship

between CSR performance and credit ratings in their study of European firms. By examining the European corporate bond market, considering national-level CSR equivalents, and utilizing ASSET4 ESG ratings data from 12 countries in the Economic and Monetary Union along with Standard & Poor's and Moody's ratings based on 872 bond samples between 2006 and 2012, they found only weak evidence suggesting that exceptional CSR performance systematically reduces credit risks. However, they did discover evidence showing that excellent CSR performance is rewarded in countries where ESG performance is above average.

In light of these research findings, the third hypothesis regarding CSR performance and credit ratings is proposed:

H3 Hypothesis: CSR performance is positively correlated with credit ratings of listed corporations in China.

2.2.3 The Relationship between Governance Performance and Credit Ratings

The structural specification of corporate governance has been identified as a significant element for modern enterprises. Abundant empirical evidence and academic studies have demonstrated an association between corporate governance efficiency and a firm's credit rating. As presented in the research study conducted by Fitch Ratings, and the subsequent discussion in its white paper, "At a credit angle, overall governance stands as the most dynamic ESG factor." While sound governance practices and well-managed governance risks may not necessarily improve the company's credit status from the baseline, poor governance can assuredly deteriorate it and could severely impact all aspects of the company's risk profile in the short, medium, and potentially long-term. Therefore, it is of crucial importance that companies strategically consider governance factors and risks and incorporate them broadly into their long-term planning.

Chinese scholars, particularly Yu et al. (2008) carried out empirical research on the influence of corporate governance on corporate risk by taking listed companies from 2002-2005 as a sample. Their findings pointed out a significant positive correlation between the concentration of equity and the financial risk of the firm. Separation of the two positions between the general manager and the chairman can reduce corporate financial risk. The proportion of executive shareholding and independent directors has a significant negative relationship with corporate financial risk.

Liu & Xu (2021) posited that corporate governance efficiency and long-term sustainable development capacity reflect the quality of financial information disclosure. Governance risks and adverse effects generated from the dimension of information disclosure often foreshadow a potentially deteriorating financial situation and credit level of the firm. If corporations hide their true financial status, it can lead to market investors misjudging the entity's financial information, or in some cases, failing to accurately obtain severely deteriorating financial data due to corporate financial statement fraud.

A study by Ashbaugh-Skaife et al. (2006) revealed a positive correlation between corporate governance activities and the credit ratings of American companies. Kiesel & Lücke (2019) exhibited the minimal yet distinct impact of ESG performance on rating decisions, particularly in terms of corporate governance. Jang et al. (2020) focused on South Korea, and used the ESG data of the Korean Corporate Governance Service (KCGS); ESG ratings are viewed as supplements to credit ratings as they contain basic non-financial information that can lower the cost of debt financing, especially for smaller enterprises.

Based on the work discussed, one can forecast a positive correlation between credit ratings and corporate governance. Hence, the fourth hypothesis is proposed:

H4 Hypothesis: There is a positive correlation between corporate governance and credit ratings of listed corporations in China.

2.3 Correlation Theory

2.3.1 Stakeholder Theory

The term "stakeholder" was initially introduced by the Stanford Research Institute in 1960 (Stanford Research Institute, 1960 as cited in Freeman & Reed, 1983). However, it was R. Edward Freeman who systematically delineated the stakeholder theory. This framework argues that the shareholder-centric perspective is overly restrictive, over-emphasizing the employment of labor by capital, and fundamentally denies the essential contributions of stakeholders, most notably human capital, to a firm's value creation. Stakeholder theory posits that shareholders and creditors are not the sole parties influencing a company's operation and management. Employees, upstream and downstream clients, and the natural environment are also integral factors.

In 2010, Freeman and his colleagues in their opus "Stakeholder Theory: The State of the Art," simplified stakeholders into primary and secondary categories (Freeman, Reed, Harrison, Wicks, Parmar, & Colle, 2010). They believed the responsibilities taken by companies to parties beyond shareholders should be included in the overarching fiduciary duty of the management, constituting corporate social responsibility in a broader sense. Fulfilling these social responsibilities embodies both a moral obligation and an essential requirement for businesses to attract and maintain strategic resources. Without capital input from shareholders, factor contributions from other stakeholders, and robust consumer support, it is virtually impossible for a business to create value for shareholders through sustained operations.

Following the stakeholder theory, Donaldson, Preston & Jones (1995) suggested that the satisfaction of different types of stakeholders could potentially enhance financial performance. Galbreath (2013) pointed out that ESG has evolved into a crucial indicator of a company's non-financial performance. Negligence concerning environmental pollution, the lack of social responsibility, and the deficiency of corporate governance will negatively impact employees, communities, and broader societal interests, consequently affecting

corporate performance and lowering company valuations.

2.3.2 Information Asymmetry Theory

The theory of information asymmetry was initially proposed by American economists Joseph Stiglitz, George Akerlof, and Michael Spence. It refers to the different understanding of relevant information among various individuals in market economic activities. Those who have more information are usually in a more advantageous position, while those with limited information are in a less advantageous position. From the perspective of capital markets, there exists information asymmetry between a company's managers and its investors. The management team has access to the latest operational information, which is often lagging for external investors. This can lead to adverse selection problems, where one party, due to its natural information advantage, makes decisions that benefit themselves but harm the other party with limited information. The party with information advantage violates market rules, distorts market prices, undermines fairness and justice in the capital market, reduces market efficiency, and creates moral hazards. The current stock prices in the capital market mainly reflect a company's historical performance. In order to understand the specific situation of a company, investors must dig deeper into the information that is not included in the stock price. However, company managers often tend to hide negative information during operations. This results in a more serious information asymmetry, and investors make investment decisions based on false information. Once the risks of listed companies become uncontrollable, it can lead to huge losses (Stiglitz, Akerlof & Spence, 1970).

Information asymmetry arises from the separation of ownership and control in modern corporate systems. In this situation, business operators or managers have access to all the true information about the company's operations, while owners or investors, as principals, find it difficult to obtain comprehensive and authentic information as they do not participate in the actual business operations. Moreover, this process often incurs significant costs. Therefore, investors have to bear high information acquisition costs in this information transaction and usually can only rely on reports disclosed by the company to society to obtain relevant information, which also requires evaluation. Thus, the public disclosure of information related to the company's environment, social responsibility, and corporate governance can effectively reduce the current market situation of information asymmetry.

2.3.3 Sustainable Development Theory

Sustainable development theory refers to development that adheres to the three basic principles of fairness, sustainability, and commonality, which meets the needs of current society without endangering the ability of future generations to satisfy their own needs. "Maximizing net economic benefits while maintaining the quality of natural resources and the services they provide" is the definition put forth by Edward B. Barbier. Other scholars propose that sustainable development refers to "current resource use should

not reduce actual future income". Clearly, economic development in the definition refers to economic development that does not decrease environmental quality or destroy the world's natural resource base, rather than traditional economic development that sacrifices resources and the environment. Sustainable development goals fundamentally alter the traditional development concept, emphasizing coordinated economic, social, and environmental development. Attention is paid not only to the quantity but also the quality of economic growth. The concept of sustainable development requires companies to change traditional "high-consumption, heavy-pollution" production and management models and instead adopt clean production as a guiding principle, while focusing on improving economic efficiency and conserving resources and reducing emissions as much as possible. Development is restrictive. Without restrictions, sustainability cannot be attained. Companies should attach great importance to environmental protection issues, rather than opposing environmental protection actions to their own growth, to solve problems from the source and fundamentally (Barbier, 1987)

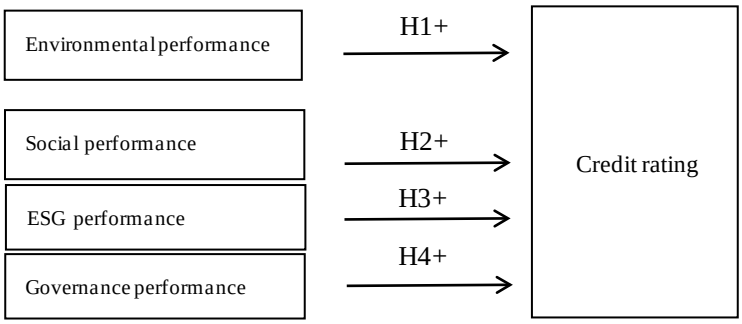
Because ESG reporting and financial reporting have different evaluation perspectives on enterprise performance and sustainability, the former focuses on macro (stakeholder) evaluation of enterprise performance and sustainability, while the latter primarily evaluates enterprise performance and sustainability from a micro (shareholder) perspective. Through examining ESG initiatives and proposals from different international organizations, it can be seen that most ESG report frameworks take providing information that helps stakeholders assess the risks and opportunities of a company's sustainable development as the main objective of ESG reporting. The profound impact of sustainable development theory on ESG is evident. In addition, many ESG report frameworks incorporate the essence of sustainable development theory in their concepts and ideas when designing indicator systems, particularly in terms of social and environmental sustainable development (Huang, 2021)

In conclusion, extensive research has begun to explore the relationship between ESG performance and credit ratings from various perspectives. Stakeholder theory, information asymmetry theory, and sustainable development theory have been used for research analysis, and while differing viewpoints exist, the consensus is that ESG performance does have an impact on enterprise credit ratings. However, opinions on the relationship and degree of impact vary depending on the region and subject. Currently, there are limited empirical analysis papers on this subject in China, and further empirical analysis is needed.

2.4 Conceptual Framework

The conceptual model is depicted in Figure 1 and it serves as the basis for the empirical analysis discussed in the subsequent section.

Figure 1：Conceptual Framework



H1 Hypothesis: There exists a positive correlation between the ESG ratings and credit ratings of listed corporations in China.

H2 Hypothesis: There is a positive correlation between environmental performance and credit ratings of listed corporations in China.

H3 Hypothesis: CSR performance is positively correlated with credit ratings of listed corporations in China.

H4 Hypothesis: There is a positive correlation between corporate governance and credit ratings of listed corporations in China.

3. Research Method and Design

3.1 Research Method

The methodology of this study primarily comprises theoretical research and empirical research approaches. After literature review, the study aims to explore the impact of ESG rating outcomes and separate Environmental (E), Social (S), and Governance (G) scores on the primary credit ratings of publicly listed companies in China from 2019 to 2021, while considering control variables to eliminate potential external influential factors. Based on research assumptions, suitable sample data were selected, models were constructed, and the statistical software 'STATA' was utilized for data analysis. This analysis included descriptive statistical analysis, correlation exploration, multicollinearity testing, and regression analysis, with E, S, and G as explanatory variables in a stepwise regression process.

To enhance the credibility of the study, research assumptions were further confirmed through robustness tests that regressed all independent variables with a one-period lag. Additionally, considering China's unique circumstances of state-owned and non-state-owned enterprises, the study conducted heterogeneity analyses for property rights to investigate the differential impacts of corporate ownership. Finally, empirical results were summarized and discussed.

Through the aforementioned research design and analytical methods, a deeper understanding of the relationship between ESG rating outcomes and individual E, S, and G scores, and the credit ratings of publicly listed companies in China will be achieved. Moreover, this study aims to explore the moderating role of corporate factors within this relationship.

3.2 Sample Selection and Data Source

The sample selection for this paper consists of enterprises in the CSI 800 Index for publicly listed companies in China from 2019 to 2021. Considering the information disclosure of ESG rating agencies and the companies, the analysis of Chinese publicly listed companies in this study uses secondary data obtained from Wind and the China Stock Market & Accounting Research Database (CSMAR).

ESG rating data are sourced from reports by Rankins CSR Ratings (RKS), a globally renowned provider of financial information services and analysis, which also offers ESG (Environmental, Social, and Governance) rating data for Chinese publicly listed companies. There are considerable differences in ESG rating systems between different countries and evaluation agencies. Nonetheless, Rankins CSR Ratings independently developed China's first listed corporate social responsibility report rating system and the country's first ESG rating system (RKS ESG Ratings), making the research more regionally distinctive and tailored.

The choice to use data from 2019 to 2021 is a comprehensive decision. China lags in domestic ESG development and the quality of information disclosure is poor. In recent years, policies related to ESG have been intensively introduced. In September 2018, China issued its revised "Corporate Governance Guidelines for Listed Companies," establishing the basic framework for ESG information disclosure. In November 2018, the "Research Report on China's ESG Evaluation System for Listed Companies" and the "Guidelines for Green Investment (Trial)" were released, constructing the core index system for measuring the ESG performance of listed companies. With the basic framework for ESG information disclosure and the core index system for measuring the ESG performance of listed companies now available, more comprehensive and accurate data samples can be obtained. The choice of recent years' data samples to support research can provide a more evidence-based research foundation, making the research results more convincing.

The reason for choosing the CSI 800 Index as the research sample is a comprehensive consideration of the ESG information disclosure rate, the coverage rate of listed companies, and corporate representativeness. Based on data compiled from WIND: In 2021, the disclosure ratios of the Shanghai Stock Exchange 50 Index, Shanghai 180, CSI 300, CSI 500, CSI 800, and CSI 1000 were 94.00%, 86.11%, 89.33%, 67.60%, 75.75% and 33.70% respectively. From the perspective of corporate attributes, the disclosure ratio of state-owned enterprises was 49%, while that of non-state-owned enterprises was 23%. (Dong, 2022). The CSI 800 Index includes 800 listed companies in China with substantial market value, covering different sectors and industries. These companies usually hold important positions in China’s economy, and their operational performance and ESG practices are highly representative (Guo, You & Guo, 2018). Choosing this index as the research object can provide a wide sample coverage, thereby better understanding the ESG performance of all listed companies in China. The CSI 800 Index is one of the important representatives of the Chinese stock market, receiving attention from a wide range of investors, research institutions, and regulatory agencies. In empirical research in

the ESG field, choosing an index that captures high market attention as the sample can increase the acceptance of the research results and the possibility of practical application.

Lastly, in the selection of the sample, due to the uniqueness of the financial sector where its financial structure and revenue levels are significantly different from other industries, companies from the financial sector are excluded. Companies labelled as ST, *ST and PT, indicating poor operating conditions, are eliminated. Also, those with missing or discontinuous data during the period are excluded.

3.3 Variables

The dependent variable in this study was the credit rating of companies listed in the China Securities Index 800 from 2019 to 2021. The independent variables incorporated the results of the RKS ESG Ratings along with the individual scores for the Environmental, Social, and Governance (E, S, G) sections. Methodologies by Huang, Liu & Liu (2014) and Shen et al. (2019) were referred to for the selection of a series of control variables that account for various corporate factors. These control variables included credit ratings, ESG Index, environmental indices, corporate social responsibility indices, corporate governance indices, company size, debt-to-asset ratio, net profit rate of total assets, cash flow ratio, sales growth rate, the number of board directors, and the years since the company was established. By controlling these factors, a comprehensive understanding of the relationship between the ESG ratings and credit ratings of listed Chinese companies could be achieved while eliminating the impact of other potential factors.

4.Empirical Research Results and Analysis

4.1Variable Definition

The selected variables for this study are summarized in Table 4-1.

Table 4-1: Variable Definitions Table

Credit	Credit Rating	Credit rating index
ESG	ESG Index	Rankings ESG score
E	Environmental Index	Rankings E Index
S	Corporate Social Responsibility Index	Rankings S Index
G	Corporate Governance Index	Rankings G Index
Size	Firm Size	Natural logarithm of total assets
Lev	Debt Ratio	Total debt at year-end divided by total assets at year-end
ROA	Return on Assets	Net profit/average total assets
Cashflow	Cash Flow Ratio	Net cash flow generated from operating activities divided by total assets
Growth	Revenue Growth Rate	Current-year revenue divided by previous-year revenue minus 1
Board	Number of Directors	Natural logarithm of the number of directors on the board
Firm Age	Firm Age	In-log (current year - firm establishment year + 1))

The study investigated the influence of RKS Global ESG Ratings and individual E, S, G scores on the credit ratings of listed companies, while considering other control variables. Specifically, the credit (credit) index was used to assess the credit risk level of listed firms. The RKS ESG Index (ESG) measures performance in three areas: environment (E), social responsibility (S), and corporate governance (G). The E score evaluates environmental protection and sustainable development, the S score gauges social responsibility performance, such as employee welfare and community contribution, and G assesses governance structure and practices.

Additional control variables include company size (Size), represented by the natural logarithm of annual total assets; asset-liability ratio (Lev), indicating financial risk level; return on total assets (ROA), showing profitability; cash flow ratio (Cashflow), reflecting cash flow health and asset utilization; business growth rate (Growth), measuring revenue growth speed; number of directors (Board), demonstrating board composition; and company operational history (FirmAge), indicating business longevity.

By studying these variables, the researchers expected to gain a comprehensive understanding of the relationship between ESG ratings, E, S, G scores and corporate credit ratings in listed Chinese companies, considering factors, such as company size, asset-liability ratio, profitability, cash flow situation, growth, and corporate governance. This provides key insight for decision-making.

4.2 Descriptive Statistical Analysis

Using Stata 15.0, the variables were subjected to a descriptive statistical analysis, as shown in Table 4-2.

Table 4-2： Descriptive Statistical Analysis

VarName	Obs	Mean	SD	Min	Median	Max
credit	793	10.0277	1.1994	0.0000	10.0000	11.0000
ESG	793	2.0463	1.2969	0.0000	1.9600	5.8600
E	793	1.6418	1.7497	0.0000	1.0800	7.1000
S	793	2.0074	1.4483	0.0000	2.0300	7.7300
G	793	2.4919	1.2192	0.0000	2.6500	6.4300
Size	793	24.5452	1.2380	21.8916	24.3465	28.5483
Lev	793	0.5208	0.1676	0.0143	0.5283	0.9601
ROA	793	0.0508	0.0603	-0.3612	0.0420	0.4249
Cashflow	793	0.0684	0.0631	-0.3977	0.0627	0.4133
Growth	793	0.2090	0.7820	-0.6930	0.1363	18.5551
Board	793	2.1859	0.2115	1.6094	2.1972	2.7726
FirmAge	793	3.1144	0.2573	2.0794	3.1355	3.7612

The study presents descriptive statistical analysis of various parameters like credit rating, ESG Ratings, company size, leverage ratio, ROA, cashflow, board and firmage, based on a sample of 793 data points. These parameters exhibit significant variances indicating diverse samples. Descriptive statistics provide the groundwork for understanding the relationship between ESG ratings, credit ratings, and other variables, enabling further in-depth research.

4.3 Correlation Analysis

Correlation analysis can help us understand the linear relationship between variables. It provides information about whether variables are positively or negatively correlated and the strength of their correlation. This helps to determine the associations between influencing factors and reveals patterns and trends among variables. To further ascertain the efficacy of the selected variables, Spearman correlation tests were conducted on each variable using Stata 15.0 software. The results of the correlation analysis are presented in Table 4-3.

Table 4-3： Correlation Analysis

	Credit	ESG	E	S	G	Size	Lev	ROA	Cashflow	Growth	Board	FirmAge
Credit	1											
ESG	0.397***	1										
E	0.361***	0.898***	1									
S	0.333***	0.909***	0.723***	1								
G	0.352***	0.822***	0.573***	0.676***	1							
Size	0.556***	0.471***	0.482***	0.374***	0.368**›	1						
Lev	0.216***	0.167***	0.176***	0.115***	0.144**›	0.570***	1					
ROA	-0.070**	-0.039	-0.044	-0.006	-0.054	-0.205***	-0.431***	1				
Cashflow	-0.017	0.051	0.055	0.053	0.020	-0.100***	-0.255***	0.486***	1			
Growth	-0.047	-0.056	-0.034	-0.040	-0.082**	0.039	0.050	0.141***	0.067*	1		
Board	0.150***	0.117***	0.091**	0.113***	0.109**›	0.158***	0.029	-0.052	0.026	-0.012	1	
FirmAge	0.070**	-0.032	-0.052	-0.009	-0.014	0.030	0.061*	-0.084**	-0.053	-0.019	0.141***	1

Note: *, **, and *** represent significance levels of 10%, 5%, and 1% respectively.

The correlation coefficient matrix reveals significant relationships between various factors and credit ratings. ESG and its sub-indicators (E, S, G) show a positive correlation with credit ratings at the 1% significance level, indicating higher ESG ratings may lead to higher credit ratings. Other correlations include:

Size and Credit have a strong positive relationship, suggesting larger firms have higher credit ratings. Leverage ratio and credit show a positive correlation, implying higher leverage ratios may result in lower credit ratings.

ROA and Credit exhibit a negative relationship, meaning lower ROA may indicate lower credit ratings.

Cashflow and Growth have weak and insignificant negative correlations with credit ratings.

Board and FirmAge display positive correlations with credit ratings, suggesting that higher board ratings and longer company history might lead to higher credit ratings.

These findings are based on the given sample data. It should be noted that further research is needed for broader inferences.

4.4 Multicollinearity Test

The document emphasizes the importance of a multicollinearity test in empirical analysis to guarantee accurate estimations and model stability. Multicollinearity, an issue of high correlation among independent variables, is checked using Variance Inflation Factor (VIF). A high VIF (>5) points to severe multicollinearity. The results of such a test are provided in Table 4-4.

Table 4-4: Multicollinearity Test

	VIF	**1/VIF**
Size	1.93	.518
Lev	1.808	.553
ROA	1.56	.641
ESG	1.335	.749
Cashflow	1.328	.753
Board	1.06	.943
Growth	1.044	.958
FirmAge	1.031	.97
MeanVIF	1.387	.

The table shows that all VIF values for the variables range from 1.031 to 1.93, and are less than 5. This suggests no significant multicollinearity amongst the variables in the model, indicating their relative independence. Also, an average VIF of 1.387, far less than 5, confirms this absence of severe multicollinearity. But, despite this, caution should be maintained while interpreting model results to avoid potential bias or underlying issues.

4.5 Regression Analysis and Results

This research utilized the Ordinary Least Squares method for regression analysis, using four models to investigate the relationships between credit ratings and various variables. The values in the table signify the regression coefficients for each independent variable, and the t-statistics are shown in parentheses. The results of the regression analysis are presented in Table 4-5.

Table 4-5: Regression Analysis

	(1)	(2)	(3)	(4)
	credit	credit	credit	credit
ESG	0.127***			
	(3.835)			
E		0.066***		
		(2.622)		
S			0.085***	
			(3.005)	
G				0.147***
				(4.483)
Size	0.517***	0.543***	0.551***	0.533***
	(10.998)	(11.392)	(12.242)	(12.139)
Lev	-0.393	-0.402	-0.416	-0.394
	(-1.206)	(-1.227)	(-1.275)	(-1.215)
ROA	0.952	0.958	0.896	1.039
	(1.238)	(1.240)	(1.161)	(1.356)
Cashflow	-0.286	-0.251	-0.242	-0.267
	(-0.425)	(-0.370)	(-0.357)	(-0.399)
Growth	-0.086*	-0.093**	-0.093**	-0.084*
	(-1.836)	(-1.977)	(-1.978)	(-1.809)
Board	0.007	0.012	0.013	-0.023
	(0.037)	(0.065)	(0.069)	(-0.125)
FirmAge	0.368**	0.374**	0.360**	0.354**
	(2.464)	(2.484)	(2.399)	(2.380)
_cons	-3.734***	-4.254***	-4.436***	-4.151***
	(-3.123)	(-3.505)	(-3.815)	(-3.660)
industry	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes
N	793	793	793	793
F	7.913	7.713	7.768	8.050
R2	0.418	0.412	0.414	0.423

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, with t-values reported in parentheses.

The regression results indicate that ESG indicators and components (E, S, G) have a positive, significant relationship with credit ratings ($p < 0.01$), suggesting higher ESG scores lead to improved credit ratings. Firm size also positively impacts credit ratings ($p < 0.01$), with larger companies having better ratings. However, leverage, return on assets, cash flow, growth rate, board size, and company age do not significantly influence credit ratings. In conclusion, ESG factors and firm size significantly affect credit ratings, while other variables do not.

4.6 Robustness Test

The research conducted a lagged regression analysis of independent variables, one time period backward, to examine time robustness, control for lag effects, and enhance result accuracy. This analysis is a robustness test. Four models were split into separate equations with lagged independent variables. The table of regression results presents each model as a column, with rows as independent variables. Table figures show regression coefficients and t-values, asterisks and bars denote significance levels. The results of the robustness test are presented in Table 4-6.

Table 4-6: Robustness Test

	(1)	**(2)**	**(3)**	**(4)**
	F.credit	F.credit	F.credit	F.credit
ESG	0.095**			
	(2.381)			
E		0.060***		
		(2.648)		
S			0.078**	
			(2.060)	
G				-0.010
				(-0.189)
Size	0.516***	0.519***	0.524***	0.568***
	(10.271)	(10.308)	(11.112)	(9.987)
Lev	-0.677*	-0.676*	-0.684**	-0.753**
	(-1.923)	(-1.907)	(-1.971)	(-2.084)
ROA	-0.209	-0.141	-0.293	-0.270
	(-0.252)	(-0.168)	(-0.355)	(-0.314)
Cashflow	0.081	0.078	0.162	0.390
	(0.096)	(0.094)	(0.192)	(0.450)
Growth	-0.335***	-0.329***	-0.346***	-0.337***
	(-2.918)	(-2.884)	(-2.988)	(-2.946)
Board	0.282*	0.291**	0.273*	0.281*
	(1.904)	(1.967)	(1.834)	(1.865)

	(1)	(2)	(3)	(4)
	F.credit	F.credit	F.credit	F.credit
FirmAge	0.208	0.221*	0.195	0.195
	(1.561)	(1.653)	(1.477)	(1.467)
_cons	-3.639***	-3.662***	-3.727***	-4.636***
	(-3.202)	(-3.180)	(-3.464)	(-3.736)
N	386	386	386	386
F	30.095	30.085	31.129	30.775
R2	0.414	0.414	0.415	0.408

Note: *, **, ***, respectively, represent the significance levels of 10%, 5%, and 1%, with t-values shown in parentheses.

In the lagged one-period regression model, ESG indicators (overall, environmental, and social) show a statistically significant, positive impact on credit ratings one period later. However, the corporate governance (G) indicator has an insignificant impact, requiring further research. Higher debt levels correlate with lower credit ratings, while larger firms tend to have higher credit ratings. The effect of ESG indicators may become uncertain when considering other variables and lag effects, suggesting further research is needed to determine causality.

4.7 Analysis of Property Rights Heterogeneity

Finally, to examine the differences in the impact of property rights, this study conducted an analysis of property rights heterogeneity. The results of the analysis of property rights heterogeneity are presented in Table 4-7.

Table 4-7： Analysis of Property Rights Heterogeneity

				Private enterprise		**Government-owned enterprise**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
	Credit	**Credit**	**Credit**	**Credit**	**Credit**	**Credit**	**Credit**	**Credit**
ESG	0.164***				0.074**			
	(3.082)				(2.238)			
E		0.080*				0.037		
		(1.958)				(1.514)		
S			0.129***				0.039	
			(2.840)				(1.438)	
G				0.184***				0.092***
				(3.409)				(2.859)
Size	0.826***	0.867***	0.858***	0.851***	0.305***	0.324***	0.333***	0.311***
	(9.099)	(9.400)	(9.758)	(9.834)	(7.165)	(7.628)	(8.330)	(7.991)
Lev	-0.726	-0.742	-0.713	-0.704	-0.340	-0.349	-0.368	-0.328
	(-1.238)	(-1.256)	(-1.213)	(-1.205)	(-1.172)	(-1.198)	(-1.264)	(-1.137)
ROA	1.469	1.285	1.403	1.746	1.657*	1.719*	1.616	1.652*
	(1.316)	(1.143)	(1.255)	(1.559)	(1.691)	(1.747)	(1.641)	(1.693)

	Private enterprise				Government-owned enterprise			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Credit	Credit	Credit	Credit	Credit	Credit	Credit	Credit
Cashflow	0.537	0.825	0.603	0.428	-0.758	-0.829	-0.736	-0.697
	(0.480)	(0.736)	(0.539)	(0.383)	(-1.165)	(-1.269)	(-1.126)	(-1.075)
Growth	-0.224*	-0.207	-0.238*	-0.230*	-0.058*	-0.064**	-0.064**	-0.055*
	(-1.742)	(-1.598)	(-1.842)	(-1.790)	(-1.793)	(-1.994)	(-1.980)	(-1.721)
Board	-0.665*	-0.620*	-0.606*	-0.756**	0.094	0.089	0.086	0.089
	(-1.901)	(-1.760)	(-1.733)	(-2.152)	(0.612)	(0.581)	(0.558)	(0.585)
FirmAge	0.307	0.301	0.277	0.303	0.019	0.033	0.026	0.004
	(1.146)	(1.112)	(1.034)	(1.137)	(0.138)	(0.242)	(0.192)	(0.032)
_cons	-10.083***	-10.878***	-10.816***	-10.697***	2.027*	1.633	1.443	1.857*
	(-4.699)	(-4.962)	(-5.190)	(-5.213)	(1.757)	(1.414)	(1.299)	(1.722)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	384	384	409	409	409	409
F	4.451	4.271	4.405	4.518	7.418	7.309	7.300	7.545
R2	0.411	0.402	0.409	0.415	0.509	0.505	0.505	0.513

Note: *, **, and *** represent the significance levels at 10%, 5%, and 1% respectively, and the values in parentheses indicate the t-values.

Table 4-7 reveals that ESG, E, S, and G all have positive effects on credit ratings in non-SOEs, while in SOEs the positive effects are only seen with ESG and G. Further, non-SOEs show stronger impacts than SOEs. In non-SOEs, positive and significant coefficients can be seen for ESG (0.164), E (0.080), S (0.129), and G (0.184), indicating their influence. Conversely, SOEs only show significant effects in ESG (0.074) and G (0.092). The key takeaway is that ESG, E, S, and G have stronger positive impacts on credit ratings in non-SOEs than in SOEs, though ESG and G still moderately affect SOEs' credit ratings.

5. Discussion of Major Findings and Future Research

5.1 Major Findings

The study investigated the relationship between the ESG ratings of listed companies in China's A-share CSI 800 Index and their credit ratings, as well as the impact of other relevant corporate factors. The researchers used empirical analysis methods and testing the proposed hypotheses and concluded the major findings thus:

Based on correlation analysis results, a significant positive relationship was observed between the ESG scores along with their subcategories--environment (E), social responsibility (S), and corporate governance (G)--and the credit ratings of listed companies within the CSI 800 Index in the A-share market of China. At a 1% significance level, the

correlation coefficients are found to be 0.361 for environment ratings, 0.333 for social responsibility ratings, and 0.352 for corporate governance ratings with respect to credit ratings. These results indicate a relatively stable positive correlation between ESG ratings and credit ratings (Friede et al., 2015; Zaidi et al., 2022).

The empirical analyses confirm a considerable influence of ESG ratings and firm size on credit ratings (Liu & Wu.2020; JoLock, 2022), with larger firms and higher ESG scores yielding better credit ratings. This influence is significant at a 1% level. However, other parameters like leverage ratio, return on assets, cash flow, growth rate, board size, and company age do not show a substantial impact.

Notably, individual ESG components (E, S, G) present distinct trends in relation to credit ratings varying in state-owned enterprises (SOEs) and non-SOEs (Attig et al., 2013; Feng et al., 2016; Schuitema, 2018; Dong 2022). Non-SOEs show positive effects for all three ESG parameters, while in SOEs, only the overall ESG rating and corporate governance aspect echo the same influence. It evidently suggests the stronger effects of ESG factors in non-SOEs compared to SOEs.

Moreover, the study corroborates a time-lagged impact of ESG scores on credit ratings, with positive effects observed a period later (Zheng et al., 2020; Liu & Xu, 2021). However, the corporate governance (G) aspect's impact remains uncertain, necessitating future exploration.

Ultimately, this analysis underscores the imperative for extending research, accounting for other variables and effects. The definitive impacts of these parameters can only be unveiled through additional diverse and broad-based investigations.

5.2 Future Research

It is important to examine the societal implications of ESG and credit ratings, and their associations with stakeholders, such as investors, customers, and employees. The relationship between ESG ratings and credit ratings should be studied across different types of businesses and industries, considering their unique characteristics and risk factors. Understanding these individualities can inform industry-specific recommendations for investors and policymakers.

Furthermore, exploring the relationship between ESG performance and credit ratings specifically for state-owned enterprises (SOEs) in China is crucial. Differential influences of enterprise nature on ESG scores and credit ratings indicate varying importance of ESG for SOEs and non-SOEs. Future research should investigate the underlying reasons and propose corresponding suggestions based on the differing management and regulatory characteristics of SOEs and non-SOEs. Factors, particularly government policies, market pressures, and stakeholder interest levels should be considered to provide precise guidance for the sustainable development of SOEs and non-SOEs. For SOEs, attention to governmental requirements, public interest, and social responsibility may be crucial, while for non-SOEs, emphasis on

brand building, public image maintenance, and stakeholder communication might be more important.

Longitudinal and multinational data can provide a global perspective. Accounting for long-term dynamics and dynamic relationships is crucial. Comparisons between Chinese mainland companies' ESG ratings and those of other countries can offer insights into Chinese corporate sustainability in a global context. Enhanced ESG data collection and reporting through collaborations, use of alternative data sources like social media for ESG performance analysis, and mandatory auditing of ESG data could enhance quality. Cross-country comparisons could provide more comprehensive insights. Additionally, studying the impact of ESG ratings on corporate performance and market value can reveal ESG ratings' role in corporate sustainability.

6. Limitations and Further Study

Limitations in this study could stem from data sources and sample selection in affecting the generalizability of the obtained results. The sample size could have included diverse industries and regions for higher reliability. The study's sample data on ESG development in China appeared to show low disclosure rates, inconsistent standards, and "greenwashing." The CSI 800 Index was used for data quality, but it perhaps did not represent all Chinese listed companies. Financial industry firms were excluded and it could potentially impact the analysis results.

7. Acknowledgements

The researchers wish to express their grateful thanks to all individuals for providing invaluable assistance during the writing of this paper, and especially for contributing to the rigorous exploration of the subject matter. Sincere appreciation is extended to scholars and data providers for the opportunities of continued collaboration and knowledge exchange within the international academic community.

8. The Authors

Fantong Gao, originally from Chongqing, China, has extensive experience in the banking industry. She graduated from Sichuan Agricultural University in 2014, majoring in finance and law, and later pursued studies in Creative Industries Management at Rajamangala University of Technology Rattanakosin in Thailand. Gao's current research focuses on green finance and sustainable development.

Zhan Xuegang, a distinguished associate professor based in Chongqing, a Chinese city, works at the Accounting School of Chongqing Technology and Business University, where he has published over ten papers since 2004. His research projects focus on government accounting and education improvements in China. In addition to his roles that involve being a guiding expert and evaluative consultant, he extends his expertise as an

adjunct professor at Rajamangala University of Technology Rattanakosin in Thailand. Zhan's commitment to training and consulting for various bureaus and associations in Chongqing has led him to earn several teaching and research accolades.

9. References

Arnold, J. (2008). Do corporate social responsibility (CSR) reports provide new information for investors? *Journal of Accounting and Economics, 2008, 46*(1), 3-51.

Ashbaugh-Skaife, H., Collins, D. W., Kinney Jr, W. R. & LaFond, R. (2006). The effect of corporate governance on firms' credit ratings. *Journal of Accounting and Economics, 2006, 42*(1-2), 203-243.

Attig, N., El Ghoul, S. & Guedhami, O. (2013). Do multiple stakeholders' orientations matter in corporate social responsibility disclosure? *Journal of Business Ethics, 2013, 117*(4), 681-700.

Barbier, E. B. (1987). Maximizing net economic benefits while maintaining the quality of natural resources and the services they provide: A sustainable development objective. *Natural Resources Forum, 1987, 11*(4), 258-260.

Barnea, A. & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics, 2010, 97*(1), 71-86.

Bauer, R. & Hann, R. (2010). Corporate environmental management and credit risk." *Journal of Banking & Finance, 2010, 34*(12), 2941-2953.

Bhattacharya, A. & Sharma, A. (2019a). The impact of ESG factors on credit rating: An empirical analysis of Indian market. *Journal of Emerging Market Finance, 2019, 18*(2), 202-222.

Bhattacharya, A. & Sharma, M. (2019b). ESG-factors and credit rating: Evidence from India. *The Indian Journal of Industrial Relations, 2019, 55*(4), 575-588.

Brammer, S., Millington, A. & Rayton, B. (2008). The contribution of corporate social responsibility to organizational commitment. *International Journal of Human Resource Management, 2008, 19*(10), 1709-1725.

China's People's Bank. (2016). *Guidelines on Building a Green Financial System*. (Online). http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/3131687/index.html, February 7, 2024.

Donaldson, T., Preston, L. E. & Jones, T. M. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review, 1995, 20*(1), 65-91.

Dong, R. (2022). An empirical study of environmental, social, and governance performance of listed companies in China. *Journal of Sustainable Development, 2022, 15*(2), 21-33. doi 10.5539/jsd.v15n2p21

Dorfleitner, G., Priberny, T. & Schuster, T. (2019). Sustainability speaks – The impact of social and environmental sustainability on corporate bonds. *Journal of Asset Management, 2019, 21*(7), 563-575.

Feng, L., Wang, J. & Li, C. (2016). Corporate social responsibility and credit ratings risk: Evidence from China's listed companies. *Sustainability, 2016, 8*(8), 806.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L. & Colle, S. D. (2010). *Stakeholder Theory: The State of the Art.* Cambridge: Cambridge University Press.

Friede, G., Busch, T. & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment, 2015, 5*(4), 210-233.

Galbreath, J. (2013). Do environmental, social and governance firms perform better financially? *Corporate Governance: An International Review, 2013, 21*(3), 363-385.

Gao, H. (2021). Fluctuations in ESG factors and operational status of companies: A study of the Fitch ESG Rating Relevance Score Model. *Chinese Journal of Finance, 2021, 41*(2), 86-99.

Graham, J. R. & Maher, A. (2006). The implications of environmental liabilities on bond and share prices. *Journal of Accounting and Economics, 2006, 42*(3), 527-554.

Guo, F., You, H. & Guo, H. (2018). An empirical study of environmental, social, and governance performance of listed companies in China. *International Journal of Economics, Commerce and Management, 2018, 6*(8), 23-35.
URLhttps://ijecm.co.uk/wp-content/uploads/2018/08/6818.pdf

Höck, A., Hieblinger, P. & Wurm, D. (2020). Price signals of credit risk and the role of ESG ratings: Evidence from CDS Spreads. *Journal of Business Finance and Accounting, 2020, 47*(7-8), 1009-1047.

Huang, S. (2021). The relationship between ESG reporting and financial reporting: A study based on the perspective of sustainable development theory. *Journal of Finance and Accounting Research, 2021, 3*(2), 21-35.

Huang, S. Z., Liu, W. & Liu, X. (2014). ESG evaluation and corporate performance reporting: Empirical evidence from listed companies on the Shenzhen Stock Exchange. *International Review of Industrial Economics, 2014, 33*(11), 132-147.

Jang, Y., Kang, H. & Ryu, D. (2020). The complementarity between credit ratings and ESG ratings: Evidence from South Korea. *Sustainability, 2020, 12*(24), 10675.

Jiraporn, P., Kim, Y. S. & Davidson III, W. N. (2014). Multiple directorships and corporate credit rating. *International Review of Economics & Finance, 2014*, 31, 24-39.

JoLock, K. (2021). ESG factors and credit ratings: A comprehensive analysis. *Journal of Sustainable Finance & Investment, 2021, 11*(2), 121-136.

Kiesel, F. & Lücke, M. (2019). The impact of ESG rating announcements on corporate credit ratings. *Journal of Sustainable Finance & Investment, 2019, 9*(1), 1-29.

Liu, B., Zhang, Y. & Liu, Y. (2020). Can ESG rating improve credit rating? An empirical study of China's corporate bond market. *Sustainability, 2020, 12*(19), 7804. doi: 10.3390/su12197804

Liu, L. & Xu, W. (2021). Corporate governance efficiency, information disclosure, and sustainable development capacity: Evidence from China. *Journal of International Accounting Research, 2021, 20*(2), 119-135.

Liu, Y. & Wu, D. (2020). An analysis of ESG rating data for Chinese publicly listed companies. *Journal of Finance and Economics, 2020, 15*(3), 78-89.

Menz, M. (2010). The value of corporate social responsibility: A differentiation perspective. *Journal of Business Ethics, 2010, 93*(2), 229-243.

O'Connell, P. (2022). ESG risks and credit status: Exploring the relationship in firms. *Journal of Risk Management, 2022, 27*(3), 54-72.

Oikonomou, I., Brooks, C. & Pavelin, S. (2014). The impact of corporate social performance on financial risk and utility: A longitudinal analysis. *Financial Management, 2014, 43*(3), 505-531.

Ryana, L., Chen, Y. & Chen, C. Y. (2017). The impact of corporate social responsibility on bond ratings and yields: Evidence from Chinese firms. *Applied Economics, 2017, 49*(11), 1095-1109.

Schuitema, J. M. (2018). The influence of corporate social responsibility on credit ratings. *Journal of Sustainable Finance & Investment, 2018, 8*(2), 107-125.

Shen, Y.F., Jia, B., Guo, W. & Zhang, L.L. (2019). Study on the corporate credit rating method based on ESG. *Econometric Financial Research, 2019,* 6, 203-217.

S & P Global Ratings. (2019). PRI statement on ESG in credit risk and ratings. (Online). https://www.spglobal.com/en/research-insights/articles/pri-statement-on-esg-in-credit-risk-and-ratings, March 11, 2024.

Stellner, C., Kleinert, J. & Ratner, M. (2015). Does CSR impact credit ratings? Evidence from European firms. *Journal of Sustainable Finance & Investment, 2015, 5*(1), 19-38.

Stiglitz, J., Akerlof, G. & Spence, M. (1970). The theory of information asymmetry. *The Quarterly Journal of Economics, 1970, 84*(3), 494-500.

United Nations Framework Convention on Climate Change. (2015). *Adoption of the Paris Agreement*. (Online). https://unfccc.int/sites/default/files/english_paris_agreement.pdf., March 25, 2024.

United Nations Principles for Responsible Investment (PRI). (2016). *ESG Credit Risk and Ratings Initiative*. (Online). https://www.unpri.org/esg-credit-risk-and-ratings-initiative-2., February 22, 2024.

Wang, X., Zhang, X. & Li, Y. (2021). ESG rating, credit rating, and credit risk: Evidence from Chinese listed firms. *Journal of Cleaner Production, 2021, 291*, 125489.
doi 10.1016/j.jclepro.2020.125489

Yu, F., Cai, N. & Mao, Y. (2008). Corporate governance and corporate risk: Empirical evidence from listed companies in China. *Journal of Financial Research, 2008,* (10), 175-186.

Zaidi, G., Khan, N., Ali, I. & Khan, M. M. (2022). The role of environmental, social, and governance (ESG) factors in distinguishing high-credit companies from low-credit companies. *Journal of Sustainable Finance and Investment, 2022, 8*(2), 78-92.

Zheng, P., Yang, B. & Dan, H. (2020). The lagging effects—Does corporate social responsibility increase financial risk? *Journal of Business Research, 2020,* 110, 283-296.