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The Superiority of Local ESG Ratings in China's Credit Risk Assessment: An Empirical Study Based on Default Distance

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Abstract

Driven by the global trend of sustainability, environmental, social, and governance (ESG) factors have become an important indicator for assessing corporate sustainability and credit risk. However, ESG rating agencies in different regions may give different ratings to the same company due to differences in assessment methods and regional applicability. Taking Chinese A-share listed companies as the research object, this paper compares the effectiveness of Chinese local ESG ratings with international ESG ratings in credit risk assessment. By constructing a linear regression model with distance to default (DD) as the dependent variable, we find that the R^2 of China's local ESG ratings is higher than that of international ESG ratings, providing greater significance and explanatory power in explaining corporate credit risk. This result suggests that local ESG ratings more accurately reflect the actual credit risk profile of Chinese firms, highlighting the importance of regional applicability in ESG ratings.

Keywords: ESG ratings, credit risk, distance to default, regional applicability

1. Introduction

In today's financial sector, ESG has become a crucial metric for evaluating corporate sustainability. With the global emphasis on environmental protection and social responsibility continuously increasing, companies are now required to focus not only on financial performance but also on their ESG performance. Integrating ESG factors not only supports a company's high-quality development but also enhances its competitiveness in the marketplace.

However, approaches to ESG assessment and focus areas vary across regions and institutions, which can lead to differing ESG ratings for the same company by domestic and international rating agencies. These discrepancies may stem from factors such as the depth of understanding of the local market environment, the applicability of evaluation standards, and the completeness of data.

As the world's second-largest economy, China has a unique market environment, regulatory policies, and corporate governance structures. Domestic ESG rating agencies may be better equipped to capture these distinct market signals and risk factors when assessing Chinese companies. In contrast, international rating agencies often apply globally unified evaluation standards, which may not fully reflect the specificities of the Chinese market.

Considering this, the primary objective of this study is to explore the effectiveness of domestic Chinese ESG ratings compared to international ESG ratings in assessing the credit risk of Chinese listed companies. The research constructs a linear regression model using distance to default (dd) as a measure of credit risk, analyzing the impact of both domestic and international ESG ratings on credit risk. The results indicate that Chinese domestic ESG ratings exhibit greater explanatory power in assessing corporate credit risk, demonstrating their applicability and advantages within the domestic market.

2. Literature Review

2.1 Role of ESG Ratings in Credit Risk Assessment

Existing studies generally acknowledge the significant role ESG ratings play in credit risk assessment. Li et al. (2022) found that ESG scores provided by international rating agencies help reduce the risk of corporate stock price crashes, particularly for companies with high environmental scores, highlighting ESG's value in aiding investors in identifying and managing credit risk. Yang (2020) also supports this view, observing an association between low carbon emissions, robust social responsibility performance, and credit risk. However, he notes that ESG does not significantly enhance the overall quality of credit ratings, suggesting that while ESG scores provide incremental information in credit risk assessment, their effect may be limited by the methodologies used by rating agencies.

2.2 Impact of ESG Factors on Chinese Listed Companies

Over the past two decades, China has significantly reshaped its ESG investment landscape through low-carbon economic policies. As the importance of ESG factors grows in China's investment decisions—especially with the rise of green bonds and corporate disclosures—more companies are integrating ESG into their business strategies to meet increasing policy requirements and investor expectations. Driven by these forces, ESG factors have had a substantial impact on the financial performance of Chinese listed companies. Environmental factors tend to negatively affect financial performance, whereas governance factors show a positive influence. This disparity reflects the varying priorities and current developmental imbalances in different ESG areas within Chinese companies (Liu et al., 2022). Additionally, improved governance levels notably impact corporate green innovation, enhancing management's environmental awareness to promote green technology investments (Tan & Zhu, 2022). As a result, ESG factors have become an essential component of corporate sustainability and financial success in China, continually deepening under the dual drivers of policy and market demand.

2.3 Limitations of International ESG Ratings

Localization in ESG ratings is key to their accuracy and market relevance, especially within China's unique economic, social, and regulatory environment. Although international ESG ratings from agencies like Bloomberg and FTSE Russell are widely used globally, these agencies often employ standardized global criteria that may fail to capture the specificities of China's market conditions and regulatory requirements. Hübel's (2020) research found that while ESG had a certain influence on the credit default swap (CDS) market internationally, its effect was relatively weak in China. Bahra and Thukral (2020) further noted that international ESG scores are typically used as supplementary rather than primary factors in traditional credit ratings, potentially leaving ESG-related liabilities for green bond issuers insufficiently captured. These studies highlight the limitations of international ratings across different economies and issuers and underscore the need for stakeholders to exercise caution when using global ESG scores to assess credit risk in the Chinese market.

2.4 Advantages of Domestic ESG Ratings

Compared to international agencies, domestic rating agencies exhibit unique advantages in credit risk assessment due to their deep understanding of the Chinese market. Beyond ESG ratings, existing literature has established that domestic credit ratings can provide more accurate and targeted insights into credit risk. Jiang and Packer (2019) pointed out that significant rating differences may exist between Chinese and international rating agencies (e.g., Moody's), with average gaps reaching 6-7 notches, indicating that the agency's background may influence the accuracy of its risk assessments. Although international ratings perform better in reducing market uncertainty, particularly in minimizing the discount rate for seasoned equity offerings (SEO), this advantage is less pronounced for government-backed and politically affiliated companies (Gounopoulos et al., 2020). This suggests that in China's capital market—where state-owned enterprises account for over 50% of market capitalization—domestic ratings may be more applicable.

Furthermore, domestic rating agencies are more sensitive to the unique dynamics of the Chinese market and better positioned to adapt to local economic conditions and regulatory changes. While foreign investors tend to rely on international ratings, in the Chinese market, bond yields show a negative correlation with domestically held ratings, suggesting that domestic ratings may better reflect China's credit market conditions (Hu et al., 2020). By introducing ESG evaluation standards more aligned with the Chinese market, domestic rating agencies can enhance the accuracy of rating outcomes, avoiding the phenomenon of "high scores with low applicability" under global standards.

2.5 Research Gaps

ESG scores do provide some informational value for credit risk management; however, differences in the frameworks of various rating agencies mean that the use and weighting of ESG scores can vary significantly, leading to inconsistencies in the effectiveness of these ratings. Notably, the divergence in risk assessment methodologies between domestic and international rating agencies highlights a lack of systematic comparative analysis of the actual role of ESG factors in credit risk across these frameworks.

Although some literature suggests that domestic credit ratings may more accurately reflect the dynamics of the Chinese market, few studies have empirically explored the applicability of domestic ESG ratings within China's specific economic and regulatory environment. Further research is needed to validate the advantages of domestic ratings in terms of adaptability to policy changes, market fluctuations, and information disclosure from a credit risk assessment and market stability perspective. Such studies will help deepen understanding of the regional applicability of ESG ratings and their potential impact on credit risk, providing more accurate risk assessment tools for investors in China and other emerging markets, as well as empirical support for policymakers seeking to optimize ESG rating systems.

3. Experimental Design

The purpose of this study is to compare the effectiveness of Chinese domestic ESG ratings with international ESG ratings in assessing the credit risk of Chinese listed companies. Unlike bond markets in many other countries, China's bond market is characterized by historically low bond default rates. In cases where companies face prolonged liquidity constraints that hinder debt repayment, government entities often intervene to provide financial guarantees and bailouts. This results in a low actual default rate, masking the true credit risk status of debt issuers in China's bond market. To more effectively and objectively measure credit risk in China's bond market, this study proposes the use of Distance to Default (DD) from the Expected Default Frequency (EDF) model as the dependent variable in constructing a linear regression model to examine the impact of both types of ESG ratings on credit risk. A higher DD value indicates that a company is further from default, implying lower credit risk.

3.1 Data Sources and Variable Selection

The research data primarily comes from authoritative databases such as CSMAR and Wind, covering relevant information on Chinese A-share listed companies from 2019 to 2023. Distance to Default (DD) is used as the dependent variable and is directly obtained from the CSMAR database.

To compare the effectiveness of different ESG ratings in assessing credit risk, the study selects the following three independent variables:

1) Overall Average ESG Score (fulmean): This variable represents the company's overall ESG performance by averaging all available ESG ratings across multiple agencies. This comprehensive ESG score includes data from both domestic and international rating agencies, providing an aggregate evaluation of ESG performance.

2) Chinese ESG Score (chnmean): This variable is based on ESG scores from reputable domestic rating agencies, such as Wind, SynTao Green Finance, and East Money Information Co., with their ratings averaged to reflect the company's ESG performance as assessed by local standards. Domestic rating agencies, with a deeper understanding of the Chinese market environment and company operations, may provide scores that better reflect the actual ESG performance of companies in China.

3) International ESG Score (intmean): This variable represents the company's ESG performance according to international standards, using scores from internationally recognized rating agencies such as Bloomberg and FTSE Russell. The ratings from these agencies are averaged to provide a measure of the company's ESG performance from an international perspective, where a unified global evaluation standard is typically applied with a focus on international comparability.

To ensure model robustness, the study normalizes the data, particularly the ESG scores, to standardize them within a range of 0 to 1. The normalization formula is as follows:

$$NormESG_{i,t} = \frac{ESG_{i,t} - \min(ESG_t)}{\max(ESG_t) - \min(ESG_t)}$$

where $NormESG_{i,t}$ is the normalized ESG score, and $min(ESG_t)$ and $max(ESG_t)$ are the minimum and maximum values of ESG scores for all firms in year t, respectively.

In order to improve the accuracy of the model and avoid omitted variable bias, the study introduces net profit margin (NPM), intangible assets (IT), gearing ratio (DTA), current ratio (Current), operating cash flow (PCF), institutional shareholding (INST), logarithm of firm size (log(size)), return on assets (ROA), and number of credit ratings (Ratnum) as control variables. The data for these variables are equally sourced from CSMAR and Wind databases.

Finally, during the data screening process, the study excludes firms with missing or abnormal data, financial sector and real estate firms (due to the specificity of their financial indicators and risk characteristics), and firms with major restructuring, delisting, or suspension. Ultimately, the study obtained a total of 14,810 firm-year observations between 2019 and 2023. Among them, both the overall model and the China ESG rating model contain 14,810 observations, while the international ESG rating model contains 14,771 observations due to the lack of international rating data for some firms.

3.2 Model Construction

To compare the effectiveness of China's local ESG ratings with international ESG ratings in assessing the credit risk of Chinese listed companies, this study constructs the following linear regression model:

$$DD_{i,t} = \beta_0 + \beta_1 \times ESG_{i,t} + \sum_{k=2}^{K} \beta_k \times Control_{k,i,t} + \epsilon_{i,t}$$

where $DD_{i,t}$ denotes the default distance of the ith firm in year t; ESG_i, t is the overall ESG score ($fulmean_{i,t}$), the local Chinese ESG score （$\mathrm{chnmean}_{i,t}$), and the international ESG score ($intmean_{i,t}$), respectively; $ControlVar_{k,i,t}$ is the value of the kth control variable, including the firm's net profit margin, intangible assets, gearing, current ratio, operating cash flow, institutional shareholding, logarithm of the firm's size, return on assets, and the number of credit ratings; and $\epsilon_{i,t}$ is the random error term corresponding to the model.

4. Regression Results Analysis

Table 1 presents regression results with Distance to Default (DD) as the dependent variable, using overall ESG score, Chinese domestic ESG score, and international ESG score as independent variables. This comparison assesses the effectiveness of Chinese domestic ESG ratings versus international ESG ratings in credit risk assessment.

Table 1. Comparison of Regression Results for ESG Rating Models

Variable	Overall	Chinese ESG	International ESG
ESG Rating	1.8e+00 ***	1.7e+00 ***	6.2e-01 ***
NPM	9.10E-05	8.80E-05	9.40E-05
IT	-4.60E-07	-7.30E-07	-1.30E-06
DTA	-6.4e-04 •	-1.1e-03 **	-1.1e-03 **
Current	-7.90E-04	1.50E-03	-9.60E-04
pcf	1.10E-08	-2.80E-08	2.40E-08

INST	2.9e-03 ***	2.5e-03 ***	2.9e-03 ***
log(size)	-2.9e-01 ***	-2.8e-01 ***	-2.5e-01 ***
ROA	4.7e-03 *	5.2e-03 **	5.8e-03 **
Ratnum	2.2e-01 ***	1.7e-01 ***	2.3e-01 ***
Adjusted R^2	0.1331	0.1381	0.1106
Observations	14,771	14,810	14,771

As shown in Table 1, ESG ratings exhibit a positive correlation with Distance to Default (DD) across all three models and are significant at the 0.1% level. In the overall model, the adjusted R^2 is 0.1331, indicating that the model explains approximately 13.31% of the variation in DD. The adjusted R^2 for the Chinese ESG rating model is 0.1381, slightly higher than that of the overall model, suggesting that Chinese domestic ESG ratings have a stronger explanatory power for corporate credit risk. The international ESG rating model, with an adjusted R^2 of 0.1106, has a lower explanatory power than the other two models.

Comparing the three models, the Chinese ESG rating model has the highest R^2 at 0.1381, which is slightly above the overall model's 0.1331 and significantly higher than the international ESG rating model's 0.1106. This implies that the Chinese ESG rating model has a stronger explanatory power for DD, indicating that using only Chinese domestic ESG ratings offers a greater advantage in assessing the credit risk of Chinese listed companies. After performing robustness tests by substituting control variables, adjusting the time window, and controlling for time-industry effects, the main results remained consistent. All model variables had VIF values below 2, indicating minimal multicollinearity.

5. Research Conclusions

The results of this study show that, compared to international ESG ratings, Chinese domestic ESG ratings exhibit a higher explanatory power for corporate credit risk. This finding may be attributed to the in-depth understanding domestic rating agencies have of the Chinese market environment, regulatory policies, and corporate operational characteristics. They can capture local factors affecting corporate credit risk more accurately, such as policy risk, market volatility, and corporate governance structure. Additionally, domestic rating agencies are familiar with industry practices and regulatory requirements related to information disclosure and data transparency, making them better equipped to assess corporate ESG performance. Conversely, international rating agencies may apply standardized global assessment criteria that do not fully account for the specificities of the Chinese market, resulting in limited applicability of their ratings in the local market.

Theoretically, this study deepens the understanding of the relationship between ESG ratings and corporate credit risk, particularly emphasizing the difference in explanatory power among different rating sources in credit risk assessment. The findings underscore the importance of localized ESG ratings, showing that regional ratings offer greater applicability within specific markets.

Practically, this study provides significant guidance for various stakeholders. For investors, the findings suggest that Chinese domestic ESG ratings should be referenced more heavily for a more accurate risk assessment when evaluating the credit risk of Chinese companies. For regulators, the results highlight the importance of supporting and improving the domestic ESG rating system. Regulatory bodies can promote the standardization and transparency of rating standards, enhancing the professionalism and credibility of rating agencies and fostering the healthy development of the capital market. For companies, improving their ESG performance, particularly according to domestic rating standards, not only helps reduce credit risk but also enhances their reputation and competitiveness in the capital market.

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