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Empirical Analysis of the Impact Mechanism of ESG rating on Commercial Credit

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Abstract

Existing research shows that corporate ESG rating is conducive to improving enterprise value and reducing information asymmetry, but few academic circles study the impact of corporate ESG rating on commercial credit financing in the supply chain. This paper takes A-share listed companies in Shanghai and Shenzhen from 2015 to 2020 to discuss the impact and mechanism of ESG rating of listed companies on the company's commercial credit level. The research results show that the company ESG rating is positively correlated with the commercial credit level. Further research find that the company ESG rating has a more significant positive impact on the commercial credit level under the background of non-state-owned property rights, non-pollution industry and long-term term of commercial credit financing. The research conclusions enrich the research literature of the economic consequences of ESG and the influencing factors of commercial credit, and also provide a theoretical reference for enterprises to explore the path of improving commercial credit level and achieve high-quality development, which has certain practical significance.

Keywords

ESG Rating; Commercial Credit; Property Rights Nature; Pollution Industry; Heterogeneity Analysis.

1. Introduction

Establishing and improving the economic system of green, low-carbon and circular development is the premise of high-quality development and an extremely important task of The Times in the new era. in the context of the new era, the concept of ESG has gradually attracted widespread social attention. ESG (environment, social, governance) is not only an important part of the green financial system, but also a new channel for the contemporary international community to evaluate the debt financing capacity of enterprises. In China, the concept of ESG started relatively late, but Chinese government departments and regulators, stock exchanges and rating agencies have successively promoted enterprises to carry out ESG management and information disclosure from different dimensions. The guidelines for the governance of listed companies revised by China Securities Regulatory Commission in 2018 requires listed companies to disclose environmental information and fulfill social responsibilities, and preliminarily establishes the basic framework of ESG information disclosure. At the "summer 2021 summit of ESG China Forum" in July 2021, the State Council indicated that ESG has been included in the key work of promoting corporate social responsibility, and state-owned central enterprises and local enterprises must play an exemplary role in the construction of ESG system. According to the Statistical Research Report on ESG information disclosure of A-share listed companies in 2020 by SynTao Green Finance, since 2021, the number of A-share listed companies issuing ESG reports in China accounts for 25.3% of the total number, and the development of ESG concept is in the ascendant.

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As a short-term financing channel different from bank credit, commercial credit has become an important source of financing for companies and a common and important way of debt financing in the operation of enterprises due to its characteristics of less restrictions and convenient access.When the company faces external financing difficulties, its dependence on commercial credit will increase, especially when the deterioration of business environment leads to the decline of enterprise income and bank financing difficulties.For example, since the outbreak of COVID-19, most companies, especially private enterprises, have had a tight cash flow situation. Commercial credit has become a key source of cash flow for the company to maintain its development. At this time, relevant practices show that companies with higher ESG ratings will be easier to resolve the corporate financing constraints under the COVID-19 than companies with lower ESG ratings.

It can be seen that studying the impact of ESG rating on commercial credit is not only helpful for enterprises to explore the path of how to improve the level of commercial credit, but also helpful to understand how ESG contributes to the economic development of emerging economies from the perspective of real enterprises.Taking the A-share listed companies in Shanghai and Shenzhen stock markets in China from 2015 to 2020 as the research object, this paper analyzes the impact of the company's ESG rating on the level of commercial credit, the results show that having a higher ESG rating can enable enterprises to obtain more commercial credit, so as to improve the debt financing ability of enterprises. At the same time, further research found that under the special background of China, the nature of non-state-owned property rights, non polluting industries and long-term financing period, ESG has a more significant positive impact on the level of commercial credit.

The main contributions of this paper are as follows: first, from the perspective of corporate debt financing, this paper explores the impact of ESG on commercial credit financing, and expands the research perspective on the economic consequences of ESG. Second, it enriches the literature on the influencing factors of commercial credit. By discussing the changes of the influencing factors of ESG rating on the level of enterprise commercial credit, it helps enterprises to identify the path of improving the level of commercial credit and improve the business performance of enterprises. Third, based on the Research scenario in China, the research findings not only provide solutions to the "financing difficulties" of private enterprises, but also provide empirical evidence support for listed companies to attach importance to and improve the company's ESG rating and achieve high-quality development.

2. Literature Review

2.1. Literature on Influencing Factors of Commercial Credit Financing

This paper combs the research on the influencing factors of existing commercial credit based on the two dimensions of the company's own characteristics and external environment. According to the company's own characteristics, it is mainly carried out from the perspectives of internal control, equity nature and financial status.In terms of internal control, Chinese scholar found that enterprises with higher quality of internal control can obtain more commercial credit financing than enterprises with lower quality of internal control; In terms of equity nature, Chinese scholar believe that the commercial credit financing obtained by the equity guarantee company of the controlling shareholder is lower than that of the equity guarantee company of the non controlling shareholder;In terms of financial status, Some Chinese scholars believes that the company's commercial credit financing ability is affected by the financial strategy, if the financial strategy deviates from the industry average level, it will have a negative effect on commercial credit financing.The external environment mainly focuses on monetary policy and market position. In terms of monetary policy, macroeconomic policy, especially monetary policy, has an impact on business credit financing of enterprises ; In terms

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of market position, Fisman and raturi (2004)[1] believe that the market position of enterprises is driven by competition. Enterprises with higher market position can obtain more commercial credit by imposing threats such as stopping supply and changing suppliers.

2.2. Study on the Economic Consequences of ESG Rating

This paper combs the research on the economic consequences of ESG in the capital market. After combing, it is found that the current research on the economic consequences of ESG rating is mainly reflected in the cost of capital. This paper combs the literature from two aspects: the impact of ESG on the stock market and the bond market.In the equity market, the current research mainly focuses on ESG and stock investment decision-making and return. Czerwi ń Ska and Ka ź Mierkiewicz (2015)[2] through the empirical analysis of the ESG rating results of Polish listed companies, it is considered that the stocks issued by companies with higher ESG rating have higher than average return, lower return volatility and lower return prediction error. In the empirical study of Deng and Cheng (2019)[3], it is found that there is a positive correlation between enterprise ESG index and stock market.However, some scholars have put forward different conclusions on whether ESG investment can bring positive returns: the research results of halbritter and dorfleitner (2015)[4] show that there is no significant difference in the return of ESG portfolio among companies with different ESG rating levels, and investors should no longer expect abnormal returns by trading different portfolios of high and low rated companies in ESG.In addition to the stock market, ESG rating has also received extensive attention in the bond market in recent years. Hachenberg and schiereck (2018)[5] proved through empirical analysis that ESG rating has a significant impact on bond pricing. The profits of enterprises with high ESG rating are more stable, which will be more conducive to maintaining a reasonable level of bond market interest rates in the case of market fluctuations (Fernandez and elfner, 2015)[6].

However, there is a lack of research on the relationship between ESG rating and corporate commercial credit financing. Only a few scholars study the economic consequences of ESG on debt financing, while ignoring the impact and mechanism of corporate ESG rating on commercial credit.Chinese scholar found that the financing cost of enterprises with good ESG performance will be significantly reduced, especially the effect of environmental performance E on enterprise financing ability is gradually increasing. Fatemi et al. (2017)[7] and others found that ESG helps to enhance the value of enterprises, thus increasing the possibility of enterprise debt financing.

To sum up, previous studies mainly investigated the influencing factors of commercial credit financing from the perspective of the company's internal and external environment, but under the background of the rise of ESG concept in China, there is little research on the impact of ESG rating of listed companies on commercial credit. Therefore, the relevant research of this paper not only enriches the literature on the economic consequences of ESG and the influencing factors of commercial credit financing, but also plays an important theoretical and practical role in promoting the sustainable development of enterprises and the construction of green financial system.

3. Theoretical Analysis and Research Hypothesis

Sustainable development emphasizes the concept of sustainable development, which means that while paying attention to the current development, it should also provide guarantee for future development. This idea has become the basic consensus to realize the community with a shared future for mankind. As a microeconomic unit, the positive behavior of enterprises seeking a balance between enterprise development, environment and social responsibility and being recognized by the capital market will inevitably send a positive signal to the society.

From the perspective of environment, the environmental aspect E in enterprise ESG mainly focuses on the impact of enterprises on their environment in the process of production activities and the protection responsibilities that enterprises must bear in the face of these impacts. Previous studies have shown that the company's attention and governance to the environment will lead to the positive direction change of enterprise value in a certain period of time . Based on sustainable development theory and signal transmission theory, high-quality environmental investment and information disclosure can not only help the company obtain a higher ESG rating in the capital market, but also send a good signal to investors and creditors, that is, the company has a low risk of default and increase the trust of creditors in the company.

From the perspective of social responsibility, the aspect of social responsibility in corporate ESG mainly focuses on the equal treatment of stakeholders, such as employee welfare and health security. Based on the theory of sustainable development, enterprises make institutional arrangements conducive to stakeholders, which will also endogenously enhance the comprehensive competitiveness of enterprises, which will help enterprises obtain higher market recognition and ESG rating. Further, based on the signaling theory, investors will be more convinced of the company's future sustainable development ability and solvency through higher ESG rating, and then perceive less risk.

From the perspective of corporate governance, corporate governance in enterprise ESG mainly focuses on the internal governance of the company, such as organizational structure, governance environment, operation mechanism and so on. Corporate governance is the performance of the interaction of various elements within the company, and it is a process of continuous improvement. Good corporate governance shows that its governance risk is low, and governance risk is the fundamental reason for the company's financial and operational risk; According to the signal theory, a higher ESG rating will convey a good level of corporate governance to investors, and then reduce investors' expectations of corporate risk.

Commercial credit is a credit relationship formed by the operator in the supply chain contract on the basis of deferred payment and advance payment. Its essence is the short-term credit line provided by the creditor to the debtor, and its obtain degree depends on the risk level perceived by the creditor to the company. From the above analysis of environment, society and corporate governance, it can be seen that the governance and protection of the environment, the maintenance of corporate social responsibility and the improvement of corporate governance will affect the ESG rating of the company, and then affect the evaluation of creditors' expected credit risk and the degree of trust in the enterprise. There is no doubt that a higher ESG rating will significantly reduce the risk perceived by creditors, and then improve enterprises' access to more commercial credit. To sum up, this paper assumes that:

Hypothesis: when other factors remain unchanged, the ESG rating of listed companies is positively correlated with the commercial credit obtained by the company.

4. Research Design

4.1. Sample Selection and Data Sources

We chose 2015 as the starting point for the sample for the following reasons: (1) the mandatory environmental information disclosure mechanism of listed companies was formally proposed in *the Overall Plan for the Reform of the Ecological Civilization System (2015),* and environmental awareness was given spatial attention in China's business activities; (2) in 2015, the Hong Kong Stock Exchange put forward semi-mandatory requirements for ESG information disclosure of listed companies in the *Environmental, Social and Governance Reporting Guidelines*. The financial data is mainly from the CSMAR database, and the ESG rating data is derived from the Wind database. Eliminate financial sector, *ST and missing values. This paper selects the A-share listed companies in the Shanghai and Shenzhen stock markets from 2015 to 2020 as the final 2618 observations, which constitute non-equilibrium panel data. Furthermore, to avoid the effect of outliers, all continuous variables are winsorized at 1% and 99% percentiles of their distribution.

4.2. Variable Definitions

Explained variable (TC): commercial credit.This paper mainly examines the impact of ESG rating on commercial credit of listed companies from the perspective of commercial credit scale, so this part explores from the perspective of different commercial credit measurements to achieve more comprehensive empirical analysis. We use "Accounts Receivable/Total Assets" as a business credit (TC); in addition, we use "(Accounts Payable + Notes Payable + Advance Receipts)/Total Assets" as another measure of business credit (TC_0) as a robustness test in place of the explanatory variables.

Explanatory variable (Ratings): ESG Ratings. In this paper, discrete variables are set according to the SynTao Green Finance rating distribution; where A+ is defined to 10, and A is 9, successively D is 1.

Control variables. In order to control the influence of other factors on the research results and improve the explanatory power and reliability of the model, we refer to the research results of the existing literature, and select the enterprise scale, enterprise nature, equity concentration, financial leverage, profitability, corporate growth, mortgage capacity, return on net assets, and annual dummy variables as control variables, and the specific definitions and measurements are shown in Table 1.

Table 1. The names and definitions of the control variables

Type	Name	Symbol	Definition
Explained variable	commercial credit	TC	Business credit size = accounts receivable / total assets
Explanatory variable	ESG Ratings	Ratings	SynTao Green Finance ESG ratings index
Control variables	Firm size	Size	The natural logarithm of the company's total assets (in tens of millions)
	Nature of property right	SOE	Virtual variables, such as 1 for state-owned enterprises and 0 for non-state-owned enterprises
	Equity concentration	First	Shareholding ratio of the largest shareholder at the end of the period (thousands)
	Capital structure	Leverage	Total closing liabilities / final total assets
	Profitability	ROA	Total assets remuneration rate
	Enterprise growth	Growth	Operating income growth rate = (operating income at the end of the year - operating income at the end of the previous year) / operating income at the end of the previous year
	Mortgage capacity	Capital	The ratio of fixed assets to total assets
	Return on equity	ROE	Percentage of net profit to average shareholders' equity
	Annual dummy variable	Year	When the firm belongs to an industry, the value is 1; otherwise is 0

4.3. Empirical Framework

Referring to the existing literature, we examine the following model:

$$TC_{it} = \beta_0 + \beta_1 Ratings_{it} + \beta_2 Size_{it} + \beta_3 SOE_{it} + \beta_4 First_{it} + \beta_5 Leverage_{it} + \beta_6 ROA_{it} + \beta_7 Growth_{it} + \beta_8 Capital_{it} + \beta_9 ROE_{it} + \beta_{10} Year_{it} + \varepsilon_{it}$$

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5. Empirical Results and Test Analysis

5.1. Descriptive Statistics

Table 2 shows the descriptive statistical results for the main variables. First of all, the average value of commercial credit scale (TC) in the sample period was 0.102, the standard deviation index was 0.100, the maximum value was 0.484, and the minimum value was 0.000, indicating that there were large differences in the scale of commercial credit among enterprises in China; secondly, the average ESG rating score (Ratings) of the explanatory variable was 5.098, which was closer to the median 5.000, the minimum value was 3.000, and the maximum value was 8.000, indicating that the ESG disclosure rating range of most companies was C+～ Grade B. Finally, the relevant control variables are added for statistics. Among them, the average value of enterprise size (Size) is 22.138, indicating that the overall scale of China's listed companies during the study period is larger and the development prospects are better. The average value of property rights (SOE) is 0.481, which reflects that China's listed companies still have a large proportion of holding companies in China during the sample period.

Table 2. Basic descriptive statistics for the key variables.

Variable	Obs	Mean	Mediam	Std.Dev	Min	Max
TC	2618	0.102	0.070	0.100	0.000	0.484
Ratings	2618	5.098	5.000	0.993	3.000	8.000
Size	2618	24.030	23.790	1.301	20.950	28.640
SOE	2618	0.481	0.000	0.500	0.000	1.000
First	2618	0.038	0.036	0.016	0.008	0.074
Leverage	2618	0.492	0.504	0.190	0.059	0.912
ROA	2618	0.064	0.057	0.072	-0.324	0.242
Growth	2618	0.139	0.098	0.346	-0.618	3.099
Capital	2618	0.201	0.153	0.170	0.002	0.692
ROE	2618	0.092	0.096	0.131	-0.668	0.370

5.2. Correlation Analysis

In order to test the correlation between the variables, the coefficient tests for each of the main variables are first performed, using the Spielmann correlation test and the Pearson coefficient test, respectively. According to Table 3, both the explanatory and control variables have significant correlations with the explanatory variables. The key explanatory variable ESG rating (Ratings) was significantly positively correlated with the interpreted variable Business Credit Size (TC), and the Spielman correlation coefficient was 0.045, significant at the 5% level, consistent with theoretical assumptions. In addition, the relationship between the characteristic variables of each company and the scale of commercial credit is consistent with the conclusions of the existing relevant literature, and the control variable indicators such as the company's growth capacity and equity concentration have a significant impact on the scale of commercial credit. The results of the correlation analysis between variables show that the variable selection is appropriate.

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Table 3. Correlation analysis

	TC	Rating	Size	SOE	First	Leverag	ROA	Growth	Capital	ROE
TC	1	0.045**	-0.281***	-0.178***	-0.126***	-0.058***	-0.024	0.051***	-0.163***	-0.041**
Ratings	0.021	1	0.155***	0.170***	0.088***	0.057***	-0.043**	-0.062***	0.150***	-0.035*
Size	-0.214***	0.163**	1	0.366***	0.215***	0.630***	-0.229***	0.021	0.107***	-0.032
SOE	-0.168***	0.173**	0.354***	1	0.327***	0.169***	-0.189***	-0.112***	0.116***	-0.175***
First	-0.106***	0.094**	0.232***	0.318***	1	0.062***	0.063***	-0.047**	0.113***	0.102***
Leverage	0.026	0.056**	0.606***	0.164***	0.062***	1	-0.443***	-0.007	-0.032	-0.160***
ROA	-0.057***	-0.021	-0.118***	-0.106***	0.108***	-0.363***	1	0.302***	0.050**	0.884***
Growth	0.039**	-0.049*	0.005	-0.086***	-0.042**	0.001	0.250***	1	-0.085***	0.380***
Capital	-0.264***	0.159**	0.151***	0.169***	0.136***	0.039**	0.013	-0.070***	1	-0.089***
ROE	-0.051***	-0.012	0.039**	-0.075***	0.122***	-0.187***	0.908***	0.292***	-0.046**	1

5.3. Baseline Regression Results

Column (1) of Table 4 reports that there is a positive correlation between the ESG rating of the theoretical model company and the level of commercial credit and is significantly at the level of 1%, indicating that the ESG rating of the listed company has a significant positive impact on the acquisition of the company's commercial credit under the condition that other factors remain unchanged. The regression results show that the higher ESG rating of the enterprise is conducive to the accumulation of the enterprise's commercial credit, and verifies the hypothesis that the ESG rating of the listed company has a positive impact on the commercial credit.

5.4. Robustness Tests

Replace the interpreted variable. In order to exclude the contingency in the choice of the interpreted variable enterprise business credit scale metric, drawing on existing research, the commercial credit metric TC0, which is the sum of accounts payable, notes payable and advance receipts, is used to replace the original interpreted variable TC. In Regression (2) in Table 4, the results show that the explanatory variable (Ratings) is positively correlated with the explanatory variable (TC0), and the results robustly support the hypothesis in this paper.

Preserve manufacturing. China's manufacturing industry is a typical representative of traditional enterprises, playing a pivotal role in China's economic and social development, therefore, considering the heterogeneity between industries in the sample range and the representativeness of the manufacturing industry, the robustness test only selects China's main industry manufacturing industry as the sample range. The results of column (3) of Table 4 show that the explanatory variable (Ratins) and the explanatory variable (TC) are significantly positively correlated at the 5% level, indicating that the impact of ESG ratings on corporate access to business credit is still robust.

Company clustering. We conduct robustness tests through clustering adjustments at the company level. The results of column (4) of Table 4 show that the explanatory variable (Ratings) and the explanatory variable (TC) are significantly positively correlated at the 1% level, and the results are consistent with the above main effect regression results, which shows that the higher ESG rating of the enterprise has a positive effect on the enterprise's business credit level, making the empirical conclusion more robust.

The initial performance of the introduction of the ESG concept into China's capital market. In the early days, the ESG concept was initially introduced into China's capital market, and in 2017, the Responsible Investment Principles Organization (PRI) began to officially start working in China, so the ESG concept was in a period of growth until 2017. In order to better verify the impact of ESG ratings on commercial credit financing, this paper selects sample data from 2015 to 2017 to examine the relationship between ESG and commercial credit in the growth stage of the concept by annual regression. The results of Table 5 show that the explanatory variables (Ratings) and the explanatory variables (TCs) in 2015, 2016 and 2017 are significantly positively correlated at the 1% level, which is consistent with the previous article, indicating that in the early stages of the introduction of the ESG concept into China's capital market, the ESG rating has played a positive role in promoting the improvement of the company's commercial credit level, and thus more robustly tests the hypothesis of this paper.

Table 4. Baseline regression and robustness tests

	(1)Baseline regression	(2) Replace the interpreted variable	(3) Preserve manufacturing	(4)Company clustering
	TC	TC_0	TC	TC
Ratings	0.011***	0.005*	0.006**	0.011***
	(5.812)	(1.747)	(2.402)	(3.608)
Size	-0.023***	-0.007**	-0.023***	-0.023***
	(-11.850)	(-2.463)	(-8.494)	(-6.872)
SOE	-0.015***	0.009	-0.011**	-0.015*
	(-3.652)	(1.543)	(-2.352)	(-1.838)
First	0.002	0.444**	0.226	0.002
	(0.014)	(2.514)	(1.500)	(0.008)
Leverage	0.114***	0.296***	0.150***	0.114***
	(8.607)	(14.171)	(8.549)	(4.910)
ROA	-0.023	-0.677***	-0.334***	-0.023
	(-0.330)	(-5.868)	(-3.597)	(-0.187)
Growth	0.008	-0.015*	0.018**	0.008
	(1.444)	(-1.872)	(2.318)	(1.329)
Capital	-0.134***	-0.226***	-0.234***	-0.134***
	(-12.018)	(-13.831)	(-14.249)	(-7.662)
ROE	-0.004	0.423***	0.142***	-0.004
	(-0.116)	(7.601)	(2.915)	(-0.060)
Year	Yes	Yes	Yes	Yes
_cons	0.581***	0.201***	0.626***	0.581***
	(13.418)	(3.150)	(10.219)	(7.880)
N	2618.000	1483.000	1420.000	2618.000
R^2	0.145	0.354	0.217	0.145

Table 5. Annual groupings

	(1)2015	(2)2016	(3)2017
	TC	TC	TC
Ratings	0.019***	0.016***	0.016***
	(2.889)	(2.787)	(3.038)
Size	-0.011	-0.014**	-0.014**
	(-1.648)	(-2.220)	(-2.413)
SOE	-0.026*	-0.030**	-0.031**
	(-1.765)	(-2.186)	(-2.436)
First	-0.256	-0.042	0.100
	(-0.637)	(-0.109)	(0.279)
Leverage	0.070	0.090*	0.090*
	(1.431)	(1.893)	(1.968)

ROA	-0.124	0.098	0.204
	(-0.437)	(0.332)	(0.787)
Growth	-0.020	0.002	0.021
	(-1.529)	(0.072)	(1.415)
Capital	-0.160***	-0.159***	-0.142***
	(-4.056)	(-4.464)	(-4.370)
ROE	0.093	-0.104	-0.178
	(0.611)	(-0.721)	(-1.374)
Year	Yes	Yes	Yes
_cons	0.302*	0.367**	0.363***
	(1.966)	(2.584)	(2.717)
N	241.000	272.000	302.000
R^2	0.136	0.135	0.133

5.5. Endogeneity Test

Table 6. Robustness test: introduction of 2SLS instrumental variables

	(1)	(2)
	First (Ratings)	Second (TC)
IV	0.957***	
	(18.974)	
Ratings		0.033***
		(5.402)
Size	0.066***	-0.028***
	(2.785)	(-10.073)
SOE	0.060	-0.016***
	(1.189)	(-2.785)
First	0.434	-0.009
	(0.300)	(-0.052)
Leverage	-0.226	0.098***
	(-1.317)	(4.908)
ROA	-0.799	-0.111
	(-0.842)	(-1.006)
Growth	0.025	0.001
	(0.387)	(0.153)
Capital	0.238*	-0.172***
	(1.762)	(-10.797)
ROE	0.505	0.016
	(1.102)	(0.299)
Year	Yes	Yes
_cons	-1.383**	0.616***
	(-2.456)	(9.868)
N	1483.000	1480.000
R^2	0.267	0.138

Our research found that the higher the ESG rating of a listed company, the higher the level of commercial credit obtained by the company, but it may also be because the company obtains more commercial credit, and it is necessary to actively fulfill corporate responsibilities and improve ESG performance, that is, there may be a mutual causal relationship between the company's ESG rating level and the commercial credit level. In order to verify whether there is

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an endogenous problem, this paper uses the instrumental variable method to study the test. In this article, we refer to the customary practice of the academic community and use the industry-annual mean of ESG as a tool variable to alleviate the endogenous problems of this paper. The regression results in Table 6 show that the regression results are still significant using the explanatory variables of the sector-year mean as instrumental variables, and the economic conclusions are consistent with the assumptions. This paper finds that the higher the ESG rating of the listed company, the higher the level of commercial credit obtained by the company, but it is also possible that the company has obtained more commercial credit, and it is necessary to actively fulfill corporate responsibilities and improve ESG performance, that is, there may be a mutual causal relationship between the company's ESG rating level and the commercial credit level. In order to verify whether there is an endogenous problem, this paper uses the instrumental variable method to study the test. In this article, we refer to the customary practice of the academic community and use the industry-annual mean of ESG as a tool variable to alleviate the endogenous problems of this paper. The regression results in Table 6 show that the regression results are still significant using the explanatory variables of the sector-year mean as instrumental variables, and the economic conclusions are consistent with the assumptions.

6. Additional Evidence

6.1. Grouping of Property Rights

In the context of China's special system, the nature of property rights is a significant static feature between companies. For state-owned enterprises, due to the natural strong political connection, the government's implicit guarantee degree is higher, so that it can convey to stakeholders the information of less risk of default, to a certain extent, will weaken the credit risk perceived by creditors, therefore, the marginal effect of ESG rating on commercial credit financing under the nature of state-owned property rights is low; at the same time, state-owned enterprises also bear more policy burdens and social responsibilities in addition to operation, When state-owned enterprises fulfill their social responsibilities, stakeholders have a low level of responsiveness to their improvement of ESG performance. Therefore, among state-owned enterprises, the information value of ESG ratings may have a weaker effect on commercial credit financing.

Based on the above theoretical analysis, in order to explore the influence of property rights in the relationship between ESG rating and commercial credit, this paper divides the property rights properties of enterprises in the sample into two groups, state-owned and non-state-owned, and conducts group regression tests. The results of the group regression are shown in Table 7 below, which show that the ESG rating level of state-owned and non-state-owned companies is positively correlated with the scale of commercial credit. When the enterprise is a state-owned enterprise, the explanatory variable (Ratings) and the explanatory variable (TC) are significantly positive at the 1% level, with a coefficient of 0.007, and when the enterprise is a non-state-owned enterprise, the explanatory variable (Ratings) and the interpreted variable (TC) are significantly positive at the 1% level, and the coefficient is 0.016. The results show that the impact of ESG ratings on commercial credit under non-state-owned enterprises is greater than that of state-owned enterprises, which confirms the above hypothesis.

6.2. Industry Characteristics

As green development has gradually become the mainstream concept of social development, enterprises have actively improved their environmental performance and accelerated transformation and upgrading. On the one hand, while protecting the environment and generating social benefits, enterprises will also increase private costs and reduce market competitiveness, and polluting industries will invest more related costs and relatively low economic performance, so creditors may be more inclined to provide commercial credit for non-polluting industries. On the other hand, as an important non-financial indicator, ESG rating can send a positive signal to stakeholders such as society and the public that the company is performing well and has high corporate value in environmental protection, social responsibility and corporate governance. However, due to high pollution, high energy consumption, high governance costs and possible environmental violations in the polluting industry, it will interfere with the positive role of ESG rating signals, weakening the positive promotion effect of ESG ratings on corporate commercial credit financing. Therefore, it is difficult to translate the ESG impact effect of companies in polluting industries into economic effects, that is, the positive impact of ESG ratings of companies in polluting industries on business credit levels is relatively small.

Based on the above theoretical analysis, in order to explore whether there is any heterogeneity in the characteristics of the industry in the impact effect of ESG ratings of enterprises, according to the "Guidelines for Environmental Information Disclosure of Listed Companies" issued by the Ministry of Environmental Protection, this paper defines enterprises in 16 types of industries such as thermal power, steel, cement, electrolytic aluminum, coal, metallurgy, chemical industry, petrochemical, building materials, papermaking, brewing, pharmaceuticals, fermentation, textiles, tanning and mining industries as polluting enterprises, and the rest are non-polluting enterprises for group regression inspection. From Table 7(3) and (4), it can be seen that the positive effect of ESG rating on the commercial credit level of polluting enterprises is no longer significant, and the regression results are consistent with the above theoretical analysis.

6.3. Commercial Credit Financing Term

The term of commercial credit financing also has an important impact on the company's capital cycle, and corporate debt can be divided into long-term term and short-term term according to its credit term. Under the long-term term structure, creditors may pay more attention to the ESG rating, making the marginal effect of ESG under the long-term period greater. For suppliers, suppliers provide commercial credit to the company means the concession of its opportunity cost, when the company's commercial credit financing term is selected as long-term, the higher the liquidity risk of the company's inability to repay the credit purchase on time in the future, which means that the supplier will pay more attention to the reporting information disclosed by the company, and the consideration and evaluation of non-financial indicators will also pay more attention, especially the ESG rating of listed companies as an important consideration basis for corporate solvency. In summary, this article believes that if the commercial credit is long-term, the creditor is more likely to comprehensively consider its sustainable development ability from the aspects of the company's environmental protection, social responsibility performance, and internal governance of the company, so as to determine the credit line of commercial credit as an expected judgment of future solvency, that is, when the term is longer, the relationship between ESG rating and commercial credit may be stronger.

Based on the above theoretical analysis, in order to study the moderating effect of commercial credit term between ESG rating and commercial credit, we divided the commercial credit term in the sample into two groups according to the median size, and carried out group regression test. This article defines the dumb variable PTC (business credit term), which uses the accounts payable turnover ratio to represent the business credit term PTC. PTC=0 when the business credit term is greater than the median; PTC=1 when the business credit term is less than the median. The group regression results of Table 7 show that in the model (5) (6), when enterprises with a longer financing period obtain a higher ESG rating, they receive a larger scale of commercial credit and a significant difference in coefficients between groups than enterprises with short financing periods. Overall, in the sub-sample of long-term terms, corporate ESG ratings have a greater impact on commercial credit financing.

Table 7. Additional Evidence

	Grouping of property rights		*Industry characteristics*		*Commercial credit financing term*	
	(1)Not state-owned	(2) state-owned	(3)Non-polluting	(4)polluting	(5)Short term	(6)Long term
Ratingd	0.016***	0.007***	0.017***	0.001	0.005**	0.019***
	(5.291)	(2.783)	(6.245)	(0.445)	(2.387)	(6.272)
Size	-0.030***	-0.019***	-0.026***	-0.018***	-0.020***	-0.024***
	(-8.709)	(-8.073)	(-9.487)	(-6.731)	(-8.945)	(-7.431)
First	-0.095	0.046	-0.162	0.299*	0.050	-0.121
	(-0.523)	(0.286)	(-1.005)	(1.710)	(0.378)	(-0.646)
Leverage	0.143***	0.083***	0.119***	0.124***	0.136***	0.056**
	(7.208)	(4.465)	(6.621)	(6.415)	(8.614)	(2.556)
ROA	-0.016	-0.115	0.054	-0.304***	0.053	-0.108
	(-0.176)	(-0.968)	(0.585)	(-2.910)	(0.773)	(-1.219)
Growth	0.003	0.015*	0.012	0.003	0.006	0.015
	(0.356)	(1.856)	(1.630)	(0.297)	(0.964)	(1.207)
Capital	-0.139***	-0.133***	-0.118***	-0.214***	-0.153***	-0.087***
	(-6.911)	(-10.354)	(-7.217)	(-12.993)	(-12.365)	(-5.585)
ROE	0.020	-0.016	-0.012	0.085*	-0.038	0.033
	(0.399)	(-0.274)	(-0.227)	(1.654)	(-0.714)	(0.515)
SOE			-0.019***	-0.013**	-0.018***	-0.008
			(-3.477)	(-2.131)	(-3.676)	(-1.050)
Year	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.700***	0.498***	0.620***	0.527***	0.510***	0.610***
	(9.192)	(9.604)	(10.135)	(8.740)	(10.459)	(8.346)
N	1360.000	1258.000	1553.000	1065.000	1508.000	1110.000
R^2	0.094	0.163	0.117	0.247	0.200	0.097

7. Conclusion

ESG ratings are a comprehensive value decision-making tool based on responsible investments. Taking China's A-share listed companies from 2015 to 2020 as a sample, this paper discusses the impact of the ESG rating of listed companies on the company's commercial credit level from the perspective of ecological civilization, and through panel data, empirical testing finds that the higher the esg rating of the company, the larger the scale of commercial credit obtained by the company. The above conclusions show that the higher ESG rating of listed companies can improve the level of corporate business credit to a certain extent. In addition, in further research, it was found that under the nature of non-state-owned property rights, non-polluting industries and long-term financing periods of commercial credit, the positive impact of the company's ESG rating on the level of commercial credit was more significant. The research in this paper not only enriches the literature on the economic consequences of ESG ratings, but also helps companies to further attach importance to sustainable development capabilities, and is also of great practical significance to the practice of sustainable and healthy development of green finance in China.

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