

The Impact of Credit Ratings on Bond Credit Spreads

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Abstract

The bond market is a key force serving the real economy, but its credit rating system still faces challenges such as low rating quality, insufficient differentiation and questionable credibility. In this context, this paper discusses the influence mechanism of credit rating on bond credit risk premium. The study shows that credit ratings significantly affect bond credit risk premiums by mitigating information asymmetry, providing risk pricing benchmarks, and affecting bond liquidity. The empirical analysis shows that the credit rating is significantly negatively correlated with the credit risk premium of bonds, and the higher the rating, the lower the premium. Heterogeneity analysis shows that this effect is more pronounced in small-scale enterprises and enterprises with low levels of corporate governance. Finally, this paper puts forward relevant policy suggestions from the perspectives of improving the credit rating system, strengthening regulatory policies, and improving the capabilities of market participants.

Keywords

Credit Rating; Credit Risk Premium; Bond Pricing; Information Asymmetry.

1. Introduction

As an important part of the multi-level capital market system, the bond market plays a key role in promoting capital formation, optimizing resource allocation, and supporting the real economy. In the bond pricing mechanism, credit risk premium is the core element, which directly affects the financing cost of enterprises, which in turn affects investment decisions.

Credit rating is the assessment opinion of a professional rating agency on the possibility of default by a bond issuer. Hsueh and Kidwell (1988) pointed out that credit ratings can reduce the information asymmetry between bond issuers and investors. Investors can understand the issuer's credit status and solvency through credit ratings in order to assess investment risks. According to the risk structure theory of interest rates, there is a yield difference between bonds of the same maturity but with different credit ratings, which is the credit risk premium, which reflects the market's pricing of default risk. Credit rating has become an important determinant of bond credit risk premium by affecting the market's perception of default risk.

China's bond market has now developed into the world's second-largest bond market, with a stock size of 177 trillion yuan as of 2024, playing a crucial role in serving the financing of the real economy and supporting national strategies. However, the credit rating system of China's bond market is not perfect, and the quality, differentiation and credibility of ratings still need to be improved. He Ping and Jin Meng (2010), Ma Rong and Shi Xiaojun (2016) pointed out that compared with the United States, China's credit ratings are insufficient in terms of distribution and coverage, with problems of excessive concentration of grades and high overall ratings. Sturier (2008) and Griffin et al. (2012) argue that in the "issuer pays" model, rating agencies usually give inflated ratings in order to please the bond issuer. In this context, it is of significant practical significance to explore the impact of credit rating on bond credit risk premium.

This paper focuses on the impact of credit rating on bond credit risk premium, mainly discussing the following questions: (1) How does credit rating affect bond credit risk premium? (2) Is this impact different due to different enterprise sizes and industry characteristics? (3) How to improve the credit rating system to better play its role in risk pricing? The possible innovations of this study are: the multiple mechanisms of credit rating affecting the credit risk premium of bonds are systematically analyzed from the theoretical level, and the risk pricing theory is enriched. From the practical level, policy suggestions for building a credit rating system with Chinese characteristics are put forward, which has reference value for promoting the healthy development of the bond market[1-5].

2. Literature Analysis and Hypothesis Presentation

Credit ratings affect bond credit risk premiums through a variety of mechanisms, mainly including information transmission mechanisms, risk pricing mechanisms and liquidity mechanisms. The information transmission mechanism is the basis for credit ratings to affect the credit risk premium of bonds. In the bond market, there is a serious information asymmetry between issuers and investors. As a professional third party, credit rating agencies form authoritative judgments on bond credit risk by collecting, analyzing and interpreting public and non-public information. This process reduces information asymmetry and allows investors to assess bond risk more accurately[6-7].

The risk pricing mechanism is the core of credit rating affecting the credit risk premium of bonds. Credit ratings transform complex credit risks into simple and intuitive rating symbols through a systematic rating methodology, providing the market with a common language of risk. These rating ratings directly reflect the issuer's default probability and loss rate, and become an important basis for investors to determine the risk premium. Companies with higher credit ratings usually have better solvency and credit, and the market has higher confidence in their bonds, so they can be financed at lower interest rates, resulting in a lower credit risk premium.

The liquidity mechanism is a derivative path for credit ratings to affect the credit risk premium of bonds. Changes in credit ratings can directly affect the liquidity of bonds. A high credit rating usually means broader market recognition and a larger investor base, and highly-rated bonds are usually more trusted by investors, easy to buy and sell, and more liquid. Highly liquid bonds can be realized quickly at a price closer to their intrinsic value, reducing investors' liquidity risk, which ultimately results in a lower credit risk premium.

Based on the above theoretical analysis, the following research hypotheses are proposed:

H1: Credit rating is negatively correlated with bond credit risk premium, and the higher the credit rating, the lower the bond credit risk premium[8-10].

The basis of this assumption is the information value and authentication function of the credit rating. A high credit rating indicates a low risk of default on the bond and low risk compensation required by investors, resulting in a lower credit risk premium. A low credit rating means a high risk of default, and investors demand higher risk compensation, resulting in a higher credit risk premium. This hypothesis will be tested by benchmark regression analysis.

H2: The impact of credit ratings on bond credit risk premiums is more significant in small-scale enterprises.

Small-scale businesses often face more severe information asymmetry, which the market has limited knowledge of and therefore relies more on the information provided by credit ratings. This dependency leads to credit spreads showing a higher sensitivity to credit changes in small-scale firms. In contrast, large-scale enterprises have a more transparent information environment, more channels for the market to access their information, and a relatively low

reliance on credit ratings. Therefore, it is expected that the impact of credit ratings on the credit risk premium of small-scale corporate bonds will be more significant[11-14].

3. Research Design

3.1. Sample Selection and Data Sources

This paper selects the corporate bonds of A-share listed companies as the research object, with a sample range from January 2018 to December 2023, selects the income of treasury bonds as the risk-free securities income, and calculates the credit spread of bonds before and after the bond rating adjustment. For the case where a company issues multiple bonds in the same year, the first bond data is retained. The financial data and corporate bond data of A-share listed companies used in this article are derived from the wind database and the CSMAR database. After matching screening, the missing values were deleted, and the sample volume was finally 147.

3.2. Variable Definition and Model Setting

In this paper, the bond issuance spread (CS) is taken as the interpreted variable, and the credit rating (Credit) is the explanatory variable, in which the bond credit spread = bond yield - risk-free securities return, in the A-share listed company bond data selected in this paper, the credit rating can be divided into 4 categories of AA-, AA, AA+, AAA, and the values are assigned as 1, 2, 3, and 4 in turn.

Financial indicators such as current ratio, profitability and asset-liability ratio reflect the company's financial health to a certain extent, but the impact on the credit spread obtained by corporate bonds is relatively limited. Because these metrics do not fully reveal a company's long-term solvency, market participants have evaluated this information in other ways. Therefore, the control variables in this paper mainly consider the characteristic variables of bonds and enterprises, which include: bond issuance period (Age), bond issuance scale (Insi), enterprise size (Inta), leverage ratio (Lev), and profitability (Roa). The regression model is set to:

$$CS_{i,t} = \beta_0 + \beta_1 Credit_{i,t-1} + \sum_1^j \delta_{i,t-1} Controls_{i,t-1} + Yeardummy + Indusmmy + \varepsilon_{i,t-1}$$

Table 1. Description of variables

Variable Name Definition	Definition
Bond credit spread (CS)	Bond yield – the yield on risk-free securities
Bond Credit Rating(Credit)	-
Bond Issuance Period (Age)	Bond Issuance Period (Years)
Bond issuance scale (Insi)	Bond issuance scale logarithm (100 million yuan)
Enterprise size (Inta)	The logarithm of the total assets of the enterprise at the end of the period
Leverage ratio (Lev)	The ratio of liabilities to the total assets of the enterprise at the end of the period (%)
Profitability (Roa)	The ratio of net profit margin to total assets

3.3. Empirical Analysis

The formal questionnaire is the offline delivery channel, and the sample service of the questionnaire star is used to convert the survey data into electronic data. This paper mainly conducts research through two channels, namely, visiting three brands such as Boxcar, 19 offline stores and conducting research in different communities in Nanjing and other cities. In

order to further ensure the accuracy and authenticity of the data, the sample set was screened based on the consistency of questions and answers before and after the questionnaire. There were 534 remaining valid questionnaires, and the effective rate was 94.36%. The results of sample statistical analysis on the data collected by offline new retail stores and community surveys are shown in Table 2 and Table 3.

3.3.1. Descriptive Statistics

Descriptive statistical analysis of the main variables was performed, as shown in Table 5.2 of the results. The maximum value of the credit spread (CS) is 5.87, the minimum value is 0.44, and the average value is 3.6608. This shows that compared with treasury bonds, corporate bonds have certain risks, so there will be a risk premium. The maximum value of the bond credit rating (Credit) is 4.00, the minimum value is 1.00, and the average value is 2.7687, indicating that most of the credit ratings of bonds are AA and above.

Table 2. Descriptive statistics

Variable Name	Observation	Mean	Standard Deviation	Minimum	Median	Maximum
CS	147	3.6608	1.2500	0.4400	3.9400	5.8700
Credit	147	2.7687	0.9150	1.0000	3.0000	4.0000
Insi	147	1.8272	0.9170	-0.6900	2.0100	3.6900
Inta	147	24.8038	1.4380	21.5500	25.0200	26.8500
Lev	147	71.3736	13.6670	24.5200	74.3400	95.5000
Age	147	3.4286	0.9070	1.0000	3.0000	7.0000
Roa	147	0.0050	0.0660	-0.3800	0.0200	0.1100

3.3.2. Benchmark Regression

Table 3. Benchmark regression

	(1)	(2)	(3)	(4)	(5)	(6)
	CS					
Credit	-0.2563**	-0.4030***	-0.9927***	-0.7620***	-0.6355***	-0.6562***
	(-2.4079)	(-2.9573)	(-5.5601)	(-4.1007)	(-3.6022)	(-3.6749)
Insi		0.2300*	-0.0283	-0.0170	0.0245	0.0169
		(1.7062)	(-0.2066)	(-0.1283)	(0.1973)	(0.1356)
Inta			0.5694***	0.3155**	0.2564*	0.3090**
			(4.6985)	(2.2581)	(1.9479)	(2.0952)
Lev				0.0269***	0.0262***	0.0222**
				(3.3232)	(3.4550)	(2.4395)
Age					-0.4142***	-0.4009***
					(-4.4739)	(-4.2571)
Roa						-1.3501
						(-0.7951)
_cons	4.3510***	4.3318***	-7.6320***	-3.8960	-1.3639	-2.3452
	(13.2026)	(13.2258)	(-2.9760)	(-1.4327)	(-0.5225)	(-0.8113)
N	147	147	147	147	147	147
adj. R ²	0.1520	0.1630	0.2740	0.3230	0.4050	0.4040

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

After the Hausmann test, it was decided to use fixed effects for benchmark regression analysis. Table 3 shows the specific impact of bond credit ratings on credit spreads. Regression was

performed without adding control variables, and the results showed a negative value at the 1% significance level, as shown in column (1). From column (2) to column (6), we gradually introduce control variables such as the logarithm of issuance size, enterprise size, enterprise leverage, issuance period and profitability. In these cases, the regression results are all negative at the 1% significance level, indicating a significant negative correlation between bond credit ratings and credit spreads.

3.3.3. Robustness Test

To eliminate the interference of outliers in the data from the regression analysis, we use tailing at the 1% level. Table 4 shows the regression results after the tailing process, from which we can see that the coefficient of credit is still negative at the 1% significance level. This is largely consistent with previous baseline regression results, confirming the robustness and reliability of our findings.

Table 4. Robustness test

	(1)
	CS
Credit	-0.6192***
	(-3.5384)
Insi	0.0067
	(0.0545)
Intra	0.2903**
	(1.9874)
Lev	0.0233**
	(2.5513)
Age	-0.4715***
	(-4.8298)
Roa	-1.5531
	(-0.8684)
_cons	-1.8004
	(-0.6298)
N	147
adj. R ²	0.4300

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

3.3.4. Heterogeneity Test

We categorized the data into large and small enterprises and performed regression analysis. Column (1) is the regression result of large-scale enterprises, and column (2) is the regression of small-scale enterprises. The analysis results in Table 5 show that the impact of credit on small-scale enterprises is more obvious than that of large-scale enterprises. This phenomenon can be attributed to the fact that small-scale businesses tend to face more information asymmetry challenges, so investors rely more on credit ratings when assessing their credit risk. This dependency leads to credit spreads showing a higher sensitivity to credit changes in small-scale firms.

Table 5. Heterogeneity test

	(1)	(2)
	CS	CS
Credit	-0.2367 (-0.7188)	-0.6995*** (-2.8245)
Insi	0.1552 (0.8551)	-0.0218 (-0.1180)
Inta	0.1993 (0.5259)	0.1864 (0.7221)
Lev	0.0320* (1.7476)	0.0202 (1.5665)
Age	-0.2056 (-1.5457)	-0.4963*** (-3.6217)
Roa	-19.2554*** (-2.9802)	0.1317 (0.0619)
_cons	-2.3259 (-0.2786)	1.0868 (0.1983)
<i>N</i>	75	72
<i>R</i> ²	0.424	0.424

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4. Conclusion and Recommendations

4.1. Conclusion

Credit ratings have a significant impact on bond credit spreads. The logarithm of issuance scale, issuance period and profitability of enterprises are negatively correlated with credit spreads, which means that the larger the issuance scale, the longer the term and the stronger the profitability, the smaller the credit spread. Conversely, the overall size and leverage ratio of the firm are positively correlated with credit spreads. This phenomenon reflects the market's expectation that small-scale, low-leverage companies face greater risks.

The credit spread of bonds is negatively correlated with credit rating adjustments. The credit rating of bonds is upgraded, which means that the credit risk of bond issuers is reduced, and investor confidence and demand for bonds increase. To meet this demand, interest rates on bonds fall, narrowing credit spreads. Conversely, if a bond's credit rating is downgraded, issuers often need to raise the bond's interest rate to attract investors to buy, widening credit spreads.

The impact of credit ratings on small-scale enterprises is more significant. Small-scale enterprises have more serious information asymmetry, rely more on the information provided by credit ratings, and have more limited financing channels for small-scale enterprises, and when their credit ratings decline, financing costs may rise significantly and even lead to the breakage of the capital chain.

4.2. Recommendations

As far as regulators are concerned, the first is to improve the credit rating regulatory framework, strengthen the information disclosure requirements of rating agencies, and improve the transparency of the rating process. Second, on the premise of maintaining rating quality, we should appropriately introduce a competition mechanism, encourage the differentiated development of rating agencies, and form a healthy competition pattern. For

financial institutions, the first is to improve the internal credit risk assessment system and form an independent risk judgment. Second, it is necessary to strengthen risk management capabilities, establish a more dynamic and forward-looking risk management system, and adjust risk exposure and pricing strategies in a timely manner. As far as investors are concerned, it should be recognized that credit rating is only one of the references for risk assessment, and more attention should be paid to the quality of the rating rather than just the rating level. In addition, regulatory authorities and educational institutions should strengthen investor education in the bond market, improve their risk identification and pricing capabilities, and improve investor protection mechanisms.

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