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Will Goodwill Affect the Credit Rating of Corporate Bonds?

- Evidence from the Chinese Bond Market

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Abstract: This paper mainly studies the impact of goodwill indicators on corporate bond ratings. The author selects the data of 7931 corporate bonds issued from 2015 to 2021 as the research sample and uses regression analysis to conduct research. The empirical results show that the proportion of goodwill is negatively correlated with the rating of bonds. Specifically, the moderating effect of the company's nature and the industry is significant. Compared with state-owned enterprises, the proportion of goodwill is considered more by the bond grade issued by non-state-owned enterprises. Compared with the industrial sector, the rating of non-industrial sector bonds takes goodwill more into account.

Keywords: bond rating, goodwill, corporate bond

1. Introduction

Nowadays, China's bond market is the third largest market in the world after the United States and Japan [1]. However, with the rapid expansion of the scale of the bond market, there is also an increase in the amount of bond default year by year. Statistics show that 175 bonds defaulted in 2018, involving an amount of 160 billion 34 million yuan, far exceeding the total bond defaults from 2014 to 2017. By the end of 2020, the default rate of stock bonds had even reached 1.33%.

The emergence of bond default reflects the relative lag of the credit risk control system in China's bond market. And the management of bond credit risk is inseparable from the improvement of the bond credit rating system [2]. Therefore, which indicators are included in the bond rating process has become a topic of great research value.

As a part of the overall value of enterprises and an indicator of the potential economic value that enterprises can bring excess returns, goodwill has extraordinary research value [3]. However, the research on goodwill as a factor affecting the rating results of corporate bonds is very limited. Given this situation, this paper explored the correlation between corporate goodwill and bond rating results. At the same time, this paper takes as many corporate characteristics as possible into consideration to explore whether there is a moderating effect, to provide support for the improvement of the company's credit management and bond rating mechanism in the future.

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2. Literature Review

2.1. Bond Credit Rating

Bond credit rating refers to the corresponding grade given by a specialized credit rating agency for the comprehensive evaluation of the ability and credibility of bond issuers to repay principal and interest [4]. The academic community has conducted full research on this topic, especially the analysis of the influencing factors of bond credit rating. According to the main body of the impact, the influencing factors can be divided into two types. The first type of influencing factor is part of the characteristics of bond issuers: Bond ratings have a significantly positive correlation with issuer profitability, while ratings have a significantly negative correlation with leverage [5]. Bond ratings are also positively correlated with the issuer's ability to manage debt [6]. The second type of influencing factor is the ability and reputation of the rating agencies. Studies have shown that the higher the reputation level of rating agencies, the better the rating results issued by them [7].

2.2. Goodwill

In the field of Finance and management, the research on goodwill has mainly focused on three main directions. The first is the improving method of goodwill accuracy and evaluation model. The second is the correlation between corporate mergers and acquisitions and goodwill impairment. The third is the impact of goodwill itself on other indicators. The research on the correlation between goodwill and bond credit rating belongs to the third category, but there are still research gaps.

In a word, the research on influencing factors of bond credit rating is very extensive. The research on corporate goodwill is also in-depth. However, the paper which takes goodwill as a factor affecting bond rating is very limited. Based on the makeup of the research gap, this paper will make an in-depth study on the relationship between goodwill and corporate bond credit rating.

3. Methodology

3.1. Sample Selection

The experimental data used in this paper are corporate bond credit ratings, corresponding issuer goodwill, and other data for 7 years. The data range is from 2015 to 2021 and the data are cited from the Wind database. In terms of data selection, it has been proved that the higher the bond credit rating, the more readable the annual report and the more credible the goodwill data [8]. Therefore, for the consideration of data reliability, only bond data of A and above are selected in the experiment to remove the lower credit level. After removing the missing values from the experimental data and winsorizing data, the final number of observations is 7,931.

3.2. Variable Description

(1) Dependent variable: The bond credit rating (*BR*) of corporate bonds. The variable definition refers to the research of Zijian Huang and Hui Huang. AAA, AA+, AA, and AA-/A+/ A four grades are set as 4, 3, 2, and 1 point respectively [9].

(2) Independent variable: The proportion of goodwill (*GP*) refers to the ratio between the value of goodwill and the total assets of the company.

(3) Control variable: controls are divided into bond characteristics, bond issuing enterprise characteristics, and dummy variables.

Enterprise characteristics include *State, Listed, Industry, Assets, ROE, LEV, and Development.* The characteristics of bonds include *Dist, Scale, CR,* and *Duration*.

There are also two dummy variables: The economic region where the issuing company is located

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(*area*) and the year of bind issuance (*year*).

3.3. Data Analysis Method and Model Specification

This paper uses SPSS software for data processing. In terms of outlier processing, this paper adopts winsorizing data at the level of 1% and 99%. Considering the existence of binary variables, the Pearson correlation coefficient and point biserial correlation coefficient were selected for correlation analysis. Multiple linear regression is used to analyze the impact of goodwill indicators on bond rating.

The models used for testing are as follows:

$$BR=\alpha_0+\alpha_1 GP+\alpha_2 State+\alpha_3 Industry+\alpha_4 Listed+\alpha_5 Dist+\alpha_6 Scale+\alpha_7 CR+\alpha_8 Duration+\alpha_9 Assets+\alpha_{10} ROE+\alpha_{11} LEV+area+year+\varepsilon \quad (1)$$

4. Results

4.1. Regression Analysis

The data showed that in the case of control variables, *GP* has a quite significant negative impact on *BR* ($P = 0.001 < 0.01$). This means that the larger the proportion of goodwill in assets, the lower the rating of bonds issued (see Table 1).

In addition, to ensure the validity of the analysis results, samples and variables need to meet the assumptions of multiple regression analysis. According to the model statistics in Table 1, except for the dummy variables of year and region, the maximum variance expansion factor (VIF) of other explanatory variables is 2.264, so there is no multicollinearity problem between explanatory variables; the Durbin-Waston value is 1.870, near 2, which is in the normal range, indicating that the experimental samples are independent and the explanatory variables do not have autocorrelation, which is suitable for linear regression analysis; Finally, the F statistic is 10.401, which proves that the model is significantly effective. And R^2 is 0.7109, so the independent variables and control variables set by the model can explain the 71.09% change of the BR, which proves that the fitting results are valid.

4.2. Moderating Effect

State and *Industry* are selected as moderating variables. According to the last column of Table 2, the ΔF statistics for State and Industry are significant. This shows that the R^2 of the first two moderators changes significantly, combined with the significant interaction coefficient. It can be said that the moderating effect of *State* and *Industry* is significant. The regression coefficient of *GP* is negative and the coefficient of the interaction term is positive after being affected by the moderating effect, so *State* and *Industry* weaken the effect of *GP* on *BR*.

Table 1: Regression results between BR and GP.

	Unstandardized Coefficients		Standardized Coefficients	Sig.[b]	Collinearity Statistics	
	B	Std. Error	Beta		Tolerance	VIF
(Constant)	-4.688	.141		.000		
GP	-6.455E-5**	.000	-.021	.001	.834	1.199
State	.041*	.016	.020	.013	.575	1.740

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Table 1: (continued).

Listed	-.010	.017	-.004	.561	.614	1.628
Industry	-.030*	.012	-.017	.014	.801	1.249
Dist	.131**	.013	.077	.000	.617	1.621
Scale	.003**	.001	.032	.000	.731	1.369
Duration	-.004	.003	-.008	.182	.914	1.094
Assets	.828**	.013	.554	.000	.513	1.948
ROE	.004*	.002	.019	.014	0619	1.615
CR	-.226**	.005	-.374	.000	.442	2.264
LEV	-.160**	.050	-.023	.001	.734	1.362
Adjusted R^2				.7109		
F				976.109**		
p				.000		
D.W.				1.870		

Table 2: Moderating effect.

Moderator	Variables	Unstandardized Coefficients		Standardized Coefficients	Sig.	ΔR^2 (ΔF)
		B	Std. Error	Beta		
State	*M_GP*	-.00024	.000	-.080	.000	.00399 (110.828**)
	State	.02112	.016	.010	.196	
	GPxState	.00041	.000	.086	.000	
Industry	*M_GP*	-.00010	.000	-.034	.000	.00032 (8.840**)
	Industry	-.03126	.012	-.018	.009	
	GPxIndustry	.00012	.000	.023	.003	

5. Discussion

5.1. Interpretation of Results

The high proportion of goodwill leads to the decline of bond rating, which can be understood from two aspects. A high proportion of goodwill means a relatively low proportion of other assets such as cash, inventory, and accounts receivable. And most of these assets are tangible, easy to quantify, and more solvent than goodwill, so these indicators are more valued by rating agencies, while goodwill is the opposite. On the other hand, when it comes to goodwill, it inevitably involves the impairment of goodwill. The degree of goodwill impairment will be affected by many factors, such as management capabilities, industry policies, technological upgrading, and so on, with certain uncertainties. And before goodwill impairment, it is difficult to determine whether there is a goodwill bubble and how many goodwill bubbles there are. The validity of the information contained in goodwill is unstable. Therefore, the high proportion of goodwill adversely affects the bond rating.

Another conclusion worthy of attention is the moderating effect of corporate attributes and the bond industry. The results show that the variable State weakens the negative impact of goodwill on

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bond rating. The state-owned enterprise state value is 1, which means that compared with non-state-owned enterprises, state-owned enterprise bonds are less negatively affected by the proportion of goodwill. This may be because state-owned enterprises have state credit as endorsements, and implicit government guarantees make it difficult for rating agencies to measure the risk of default on their bonds [10]. Therefore, the rating of state-owned enterprise bonds is often on the high side and distorted, resulting in a reduction in the correlation between the rating results and the original rating factors. The regression results of another moderating variable show that Industry and GP have a certain substitution effect on BR. It means that compared with non-industrial bonds, the goodwill proportion of industrial bond-issuing enterprises has a less negative impact on the rating results. This may be because, in industrial enterprises, goodwill impairment losses account for a large proportion of total goodwill [11]. The goodwill bubble is obvious, so the reference of the proportion index of goodwill is low.

5.2. Limitations

However, there are still some limitations. Most of the cited literature is Chinese. This is determined by the particularity that the topic of this paper is limited to China's bond market, which may lead to some conclusions and inferences that are not universal. Only in China, due to policy changes and other reasons, the conclusions are not always applicable in the long run. For example, in recent years, China has carried out market-oriented reform of state-owned enterprises and sharply downgraded some bond ratings according to the actual situation, which may lead to the invalidation of the conclusion that corporate attributes have a moderating effect.

5.3. Implications and Suggestions

This paper makes up for the gap in this academic direction. And the conclusion of corporate attributes and the bond industry proves that state-owned enterprise bonds and industrial bonds need to be paid more attention to. The above results of this paper further emphasize the importance of giving full play to the value of goodwill indicators and solving the problem of goodwill impairment. And it is conducive to the further improvement of the quantitative rating system and the bond classification supervision system. However, how to specifically optimize the corporate bond rating system still needs further research and analysis.

6. Conclusion

The purpose of this paper is to explore the relationship between goodwill indicators and corporate bond ratings. The sample selected is the data of 7931 corporate bonds issued in the Chinese market from 2015-2021. Data analysis was carried out by multiple linear regression after controlling variables using SPSS software.

Results statistics show that the proportion of goodwill has a significant negative impact on bond rating results. This may be caused by the existence of goodwill bubbles, the uncertainty of goodwill impairment, and the low solvency of goodwill in assets. In the moderating effect test, corporate attributes and the bond industry can significantly affect the correlation between goodwill and rating. Specifically, for state-owned enterprises, the impact of the goodwill proportion on the bond rating has been significantly weakened; In the industrial industry, the negative impact of goodwill proportion on the rating is weak; In non-industrial industries, the negative impact of the goodwill proportion on the corporate bond rating is stronger. This paper makes up for the research gap and provides a theoretical basis for improving the bond rating system, promoting the quality of information disclosure, and strengthening differentiated management. It is also conducive to avoiding systemic financial risks and enhancing the level of market credit construction.

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