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M & A of Listed Real Estate Companies and Default Risk of Credit Bonds under the Counter-Cyclical Background

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Abstract

Based on the credit bond data issued by listed real estate companies under the industry classification standard of China Securities Regulatory Commission from 2018 to 2020, the impact of mergers and acquisitions (M & A) of listed real estate companies on their credit bond default risk is empirically studied under the counter-cyclical background. The empirical results show that the M & A strategies of real estate companies will not have a significant impact on the default risk of their bonds alone; under the pressure of slowing economic growth in the counter-cyclical context, however, the implementation of aggressive expansion M & A strategies of real estate companies will increase the default risk of their bonds. For other factors that affect the default of credit bonds of real estate companies, at the external level, GDP is negatively related to the default risk of credit bonds of real estate companies; at the internal level, the level of leverage is positively related to the default risk of bonds, while the asset size, profitability, solvency and M & A strategies of companies are negatively related to the default risk of bonds; while at the bond level, the maturity and liquidity of bonds are negatively related to default risk.

Keywords

1. Introduction

With the continuous development of China's bond market, the scale of bond market continues to expand, followed by a significant increase in the scale of bond default. According to Wind, the stock of China's bond market was CNY 35.99

trillion (55.92% of GDP) in 2014; by 2020, the stock reached CNY 114.24 trillion (112.71% of GDP), an increase of nearly 2.17 times. The number of bonds issued increased from 6958 in 2014 to 50,254 in 2020, and the scale of bond issuance increased from CNY 12.19 trillion to CNY 56.9 trillion. At the same time, among the listed companies, the default scale of bonds is also expanding. In 2014, only one listed company defaulted, one bond defaulted, and the default principal, interest and scale were CNY 85.8 million. In 2020, the number of listed companies that defaulted, the number of bonds and the scale of principal and profit reached 24, 43 and CNY 32.36542 billion respectively. Moreover, this situation is particularly prominent in the credit bonds of listed real estate companies. Since 2018, six bonds of two listed real estate companies have defaulted on a scale of CNY 2.25018 billion. In 2020, the scale of default reached CNY 13.19705 billion, an increase of nearly 4.86 times.

In the past few years, China's GDP growth has slowed from 6.75% in 2018 to 2.3% in 2020. Under such counter-cyclical background, the living environment of real estate enterprises is more difficult than before, and the operation of real estate enterprises is difficult. The first is that the macro policies of the real estate industry tend to be strict, adhere to "no housing speculation" and "stabilize house prices, land prices and expectations", and implement the "three red lines" of supervision. The pilot project of real estate tax will have a significant impact on the main business of real estate enterprises in the short term. The second is that the sales of short-term housing and existing housing have been affected to a certain extent under the downward pressure of the economy since the outbreak of the pandemic, and the internal "hematopoietic" function has been greatly reduced. The third is the tightening of external financing and reducing the repayment sources of housing enterprises. The current high asset-liability ratio of large real estate enterprises reduces the financing support of external forces, and it is difficult for real estate enterprises to obtain financing cash flow or higher costs than before. These suggest that understanding and analyzing the new characteristics and causes of credit bond default of listed real estate companies under the background of counter-cycle are of profound significance to prevent and resolve the risk of default.

There are three innovations in this work. First, the data are based on a counter-cyclical backdrop of slowing economic growth in the face of the pandemic. Second, the work focuses on the credit bond market of the real estate industry, which is a relatively small scope. Third, empirical analysis rather than case analysis is used to draw relevant conclusions.

2. Literature Review

The research on the influencing factors of bond default risk is generally carried out around external factors and internal factors.

For external factors, market system risk has a significant impact on bond credit spreads through monthly panel data regression (Xu, 2017). The monthly data

of 154 companies from 2015 to 2018 was selected for empirical analysis, and the loose degree of monetary policy and the upsurge of investor sentiment have a negative impact on corporate bond credit spreads (Xue & Yang, 2020). Market, industry, geographical and macro factors affect the prediction of credit bond default risk based on LSTM and MCM (Chen, Wu, & Xu, 2021). Through the return, environmental pressure was found increase the default risk of listed companies' bonds (Hu & Wang, 2021). And economic policy uncertainty has a positive impact on bond default risk, which is empirically proved (Huang & Chen, 2022).

For internal factors, the regression results suggested that bond rating, property right nature, liquidity factors, subject rating, audit quality will affect the default risk of bonds (Yang, 2018). The empirical results also confirmed that the company's size, profitability, leverage level, governance level, bond term, etc. have a significant impact on default risk (Yang, 2019). It was concluded through the empirical test of the Logit model that the mismatch of investment and financing period will increase the default risk of corporate bonds (Zhang & Hao, 2022). In addition, in the analysis of internal factors, it was reported through theoretical and case analysis that aggressive expansion strategies have an important impact on bond defaults (Chen, 2019). The impact of M & A on credit bond default was explained by taking Lova Technology as an example (Li, 2019). The impact of aggressive takeover strategies on their default events was discussed by taking Tianguang Zhongmao as a case (Shuai, 2020).

The research on bond default risk is quite rich and thorough, but there are still inevitable deficiencies. First of all, most of these studies focus on the whole bond market, and there are few specific studies on the bond default risk of listed companies in the real estate industry. Secondly, it has been determined that the expansion strategy of M & A has an impact on the risk of bond default, but most of these are analyzed from the perspective of theory and cases, lack of empirical analysis. Accordingly, this work focuses on the real estate industry, takes the credit bonds of listed real estate companies from 2018 to 2020 as the object, makes an empirical study through OLS regression, and analyzes the impact of M & A strategies of listed real estate companies on the default risk of their credit bonds.

3. Research and Design

3.1. Theoretical Analysis and Research Hypotheses

3.1.1. M & A Strategies and Default Risk

M & A is an effective strategy for the company to expand rapidly, especially to enter new industries, and it is favored by the management of most companies. Generally speaking, M & A activities will immediately lead to a large amount of cash flow out of the company. If the acquired companies and projects cannot bring the cash flow income that can cover the cost to the M & A companies in the short term, it is easy to form a capital gap and put pressure on the corporate

debt repayment, thus increasing the default probability of corporate bonds. Moreover, if the company does not adopt prudent M & A strategies, but expands blindly and enters the industry field that cannot produce synergy, and gets into operational difficulties in this field, or acquires at a premium, resulting in a false high goodwill of the company, and then a substantial reduction in its value, it will eventually bring losses to the company and affect the interests of creditors. For real estate companies, M & A, an important means of land acquisition in recent years, has developed into one of the main strategies for expansion. As a result, the hypothesis is put forward:

H1: The intensity of M & A activity is positively related to the default risk of credit bonds of listed real estate companies. The more intense M & A activity is, the higher the default risk of bonds is.

3.1.2. Leverage Level and Default Risk

Based on the theory of financial distress cost, with the increase of corporate debt level, the probability of falling into financial distress and bankruptcy increases. When the value of the owner's equity of the company is lower than the value of the debt, the company will choose to default on its creditors. Real estate companies rely on external financing for leveraged buyout of land, generally have to bear a higher cost of debt, which will also increase the probability of bond default. As a result, the hypothesis is put forward:

H2: The level of leverage is positively correlated with the default risk of credit bonds of listed real estate companies. The higher the level of leverage, the higher the default risk of bonds.

3.1.3. Economic Situation and Default Risk

The macroeconomic situation is an unavoidable factor in almost all kinds of industries. With economic growth, the demand is exuberant, the supply increases, the market is active, and the business income of enterprises increases. On the contrary, when the economy is in the doldrums, the demand falls, the commodity market is not smooth, the business income declines, and the operating risk and financial risk rise. For the cyclical real estate industry, macroeconomic factors have a significant impact on it. When the macro-economy is improving and the credit policy is loose, the sales situation of the real estate industry continues to heat up, the financing channels are broad, and the development of real estate companies is booming. Although the debt burden is increasing, the pressure of debt repayment is close to zero. When the macroeconomic downward pressure is great and the industry policy is stricter, the sales performance of the real estate industry is declining, external financing is tightened, high debt costs cause pressure, and the default probability of real estate companies increases. As a result, the hypothesis is put forward:

H3: The economic situation has a negative correlation with the default risk of credit bonds of listed real estate companies. The lower the economic situation is, the higher the default risk of bonds is.

3.2. Variable Selection and Model Construction

3.2.1. Variable Selection

1) Risk of default. For the default risk of the interpreted variable bond, the credit spread is used to measure the default risk of the bond, drawing on the measurement methods of Sun (Sun, 2017), Zhao and Zhang (Zhao & Zhang, 2018). The calculation of credit spread is measured by the coupon rate of credit bonds minus the maturity yield of treasury bonds of the same maturity. Since most of the issuance of treasury bonds are 1-year, 2-year, 3-year, 5-year, 10-year, etc., if the coupon rate of credit bonds is not in the above-mentioned maturity range, the maturity yield of the same maturity is constructed by linear interpolation method. The specific calculation formula is as follows:

$$CS_i = R_i + R_{fi}$$

where, CS_i represents credit spread, R_i represents the coupon rate of credit bonds, and R_{fi} represents the maturity yield of treasury bonds with the same starting date and maturity as credit bonds.

2) M & A strategies. As for the explanatory variable, the intensity of M & A activity is creatively measured by the ratio of the total amount of external mergers and acquisitions of the bond issuing company to the total asset size of the company in the same year. If the company has no external M & A activity in the year of the bond issue, the value of the variable is 0. The expression of the variable formula is:

$$\text{ACQUI}_i = \text{M \& A transaction amount}_i / \text{Total asset size}_i$$

3) Control variables. Company size, leverage level, profitability, solvency, bond term, bond liquidity, and economic situation were selected as the control variables for the model. Among them, referring to Hu (Hu, 2019), the natural logarithm of total assets is selected to measure the company's scale, the asset-liability ratio is used to measure the company's leverage level, and the company's profitability is measured by the net asset interest rate; Referring to Sun (Sun, 2019), the current ratio was chosen to measure the company's solvency; Drawing on Du (Du, 2016), the bond turnover rate is used to reflect bond liquidity. All variables are defined in Table 1.

3.2.2. Model Construction

To test the theoretical hypothesis, the model is constructed:

$$CS_i = \beta_1 + \beta_2 \text{ACQUI}_i + \beta_3 \text{LEVER}_i + \beta_4 \text{LnASSET}_i + \beta_5 \text{CURREN}_i$$
$$+ \beta_6 \text{ROA}_i + \beta_7 \text{TERM}_i + \beta_8 \text{TURN}_i + \beta_9 \text{LnGDP}_i + \varepsilon_i$$

Among them, CS refers to default risk, ACQUI refers to M & A strategies, LnASSET refers to company size, LIL refers to leverage level, ROA refers to profitability, CURREN refers to solvency, TERM refers to bond maturity, TURN refers to bond liquidity, and LnGDP refers to economic situation.

Table 1. Variable definitions.

Symbols	Variables	Interpretation
CS	Credit spreads	The difference between the coupon rate and the yield to maturity of Treasury bonds
ACQUI	M & A strategies	The ratio of M & A transaction value to total assets
LnASSET	Company size	The natural logarithm of the total amount of assets
LEVER	Leverage level	The gearing ratio is the ratio of total liabilities to total assets
ROA	Profitability	Net asset interest rate is the ratio of net profit to average total assets
CURREN	Solvency	The current ratio is the ratio of current assets to current liabilities
TERM	Bond maturity	The maturity period of the bonds issued by the company
TURN	Bond liquidity	The turnover rate of the bond on the first day of listing
LnGDP	Economic situation	The natural logarithm of GDP

3.3. Sample Selection and Data Sources

Taking the 330 credit bonds of listed real estate companies under the industry classification standard of China Securities Regulatory Commission from 2018 to 2020 as the initial samples, 70 samples with missing bond coupon rate or treasury bond interest rate data and 6 samples with missing turnover rate data were deleted. All the original data are from the Wind database. Among them, the M & A data of listed companies come from Wind's MA global M & A database and are entered manually; the credit spread data are calculated by Excel from the coupon rate of bonds and the interest rates of treasury bonds with the same starting date and adjacent maturity obtained by linear interpolation. The data analysis software is Stata17.0.

4. Empirical Analysis

4.1. Descriptive Statistics

The descriptive statistics of the variables are shown in Table 2. Obviously, the average credit spread (CS) to measure the default risk of bonds is 2.274%, and the range is 5.487%, which is equal to the minimal value (0.386%) subtracted from the maximal value (5.873%), indicating that there is a big difference in the

Table 2. Descriptive statistics of variables.

Variables	Sample size	Mean	SD	Min.	Max.
CS	254	2.274	1.498	0.386	5.873
ACQUI	254	0.009	0.046	0.000	0.500
LnASSET	254	7.445	1.229	4.175	9.836
LEVER	254	76.524	9.356	35.835	91.046
ROA	254	2.481	1.417	−0.704	8.500
CURREN	254	1.677	0.512	0.912	4.274
TERM	254	4.087	1.159	2.000	7.000
TURN	254	33.158	48.179	0.000	241.000
LnGDP	254	13.703	0.027	13.642	13.722

default risk of credit bonds of real estate companies. For the intensity of corporate M & A activity (ACQUI), aggressive companies reached 50.0% of total assets in the same year for outbound M & A transactions in one year, while conservative companies did not conduct M & A activities, reflecting the significant difference in M & A strategies of listed real estate companies from 2018 to 2020.

4.2. Correlation Analysis

According to Table 3, there is a significant positive correlation between corporate leverage and bond default risk, while there is a significant negative correlation between corporate profitability, corporate solvency, bond maturity, bond liquidity and economic situation, which to some extent validates hypothesis H2 and hypothesis H3. On the other hand, there is a negative correlation between M & An activity and bond default risk, but it is not significant, indicating that M & An activity itself will not have a great impact on bond default, which needs further analysis. In addition, the correlation coefficients between variables are all less than 0.5, so it can be judged that there is no serious multicollinearity problem in the model.

4.3. Regression Analysis

The OLS method was adopted to perform robust standard false regression of the model, and the regression results are shown in Table 4.

The regression parameter of M & A strategies is 1.587, which passes the t-test under the significance level of 5%, indicating that the more aggressive the external M & A strategies of real estate companies are, the higher the possibility of default on their credit bonds. On the contrary, if the real estate company's external M & A strategies are more conservative, its credit bond default probability is lower, the hypothesis H1 was confirmed. The leverage level passed the t-test

Table 3. Correlation test results of variables.

	CS	ACQUI	LnASSET	LEVER	ROA	CURREN	TERM	TURN	LnGDP
CS	1.000								
ACQUI	−0.003	1.000							
LnASSET	−0.062	−0.085	1.000						
LEVER	0.395***	−0.128**	0.421***	1.000					
ROA	−0.253***	0.176***	0.140**	−0.386***	1.000				
CURREN	−0.154**	0.061	−0.419***	−0.307***	−0.280***	1.000			
TERM	−0.278***	0.047	0.219***	−0.059	0.247***	0.072	1.000		
TURN	−0.170***	−0.077	0.011	−0.012	−0.135**	0.072	−0.278***	1.000	
LnGDP	−0.131**	−0.101	0.145**	0.107*	−0.307***	−0.280***	−0.263***	0.184***	1.000

Note: ***, ****, *indicate that the significance levels are 1%, 5% and 10%, respectively.

Table 4. Regression results of variables.

	Parameter	SD	t-statistic	p-value
ACQUI	1.587	0.771	2.06	0.041
LnASSET	−0.173	0.077	−2.23	0.027
LEVER	0.049	0.013	3.86	0.000
ROA	−0.260	0.077	−3.36	0.001
CURREN	−0.716	0.204	−3.51	0.001
TERM	−0.378	0.072	−5.23	0.000
TURN	−0.006	0.002	−3.80	0.000
LnGDP	−17.787	2.918	−6.10	0.000
_cons	247.142	40.527	6.10	0.000
n	254			
R-squared	0.3861			
F	24.95			0.000

with a significance level of 1%, with a parameter of 0.049, indicating that the financial burden would seriously affect the likelihood of bond default, and the hypothesis H2 was confirmed. The economic situation passed the t-test at a significant level of 1%, with a parameter of −17.787, indicating that the default of real estate companies' bonds is greatly affected by external macroeconomic factors, and the hypothesis H3 was confirmed.

5. Conclusion and Suggestions

The following conclusions are drawn through an empirical analysis of the data of 254 credit bonds issued by listed real estate companies under the industry caliber of China Securities Regulatory Commission from 2018 to 2020.

First, the M & A strategies of real estate companies do not have a significant impact on the default risk of their bonds alone.

Second, the aggressive expansion of M & A strategies by highly leveraged real estate companies under the pressure of slowing economic growth will increase the risk of default on their bonds.

Third, at the external level, GDP is negatively related to the default risk of credit bonds of real estate companies; at the internal level, the level of leverage is positively related to the default risk of bonds; asset size, profitability, solvency and M & A strategies are all negatively related to the default risk of bonds; while at the bond level, the maturity and liquidity of bonds are negatively related to default risk.

Based on the above conclusions, the following suggestions are put forward:

First, as far as real estate companies are concerned, they should pay attention to the economic situation and adopt cautious M & A strategies when the economic downward pressure is great. In recent years, the economies of various countries are generally not booming due to the influence of the COVID-19 pandemic. Companies in the real estate industry should adopt a more conservative expansion strategy, reasonably adjust the level of leverage, and appropriately expand to acquire land.

Second, investors in the credit bonds of the real estate industry should pay attention to the recent profitability, solvency and leverage levels of the bond issuing companies, and judge whether the corporate strategy is in line with the current economic environment and corporate operating conditions. In the face of the macroeconomic situation, investors should be more vigilant against real estate enterprises with poor business conditions, high leverage and radical strategies, and take a cautious attitude towards their credit bond investment.

Third, bond market regulators should strengthen the supervision of the securities market to improve transparency, improve the quality standards and speed requirements of corporate information disclosure, alleviate the problem of information asymmetry between securities supply and demand, and effectively reduce the default risk of bonds. Specifically, the information disclosure system, bond rating system and bondholder meeting system should be improved to enable the market public, industry self-regulatory organizations and securities investors to supervise the behavior of the company (Chu, 2021).

Finally, there are some deficiencies, which can be considered by other researchers. With the continuous development of bond market, new factors leading to bond default keep emerging. Although some of the main factors are analyzed, they cannot be exhausted. In addition, the data collected is from listed companies, so some data of non-listed companies is still missing, leaving much

for further exploration.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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