

Research on the Influencing Factors of Corporate Credit Default Risk

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Abstract. This paper takes corporate financial indicators and the impact of corporate credit risk as the research object. This paper firstly introduces and analyses the relevant literature on enterprise financial indicators and credit risk, then classifies and analyzes the financial indicators of enterprises, and establishes the assessment model of enterprise financial indicators and credit risk on this basis. By analyzing the financial indicators of enterprises, this paper finds that the financial indicators of enterprises, such as quick ratio, cash flow position and net interest, have an important impact on the assessment of enterprise credit risk. Finally, this paper takes most of the enterprises in the world as an example and applies the established assessment model to empirically assess the credit risk of enterprises, and analyses and explains the assessment results. The findings of this paper have certain reference value for enterprises, banks and other institutions in credit risk assessment and decision-making.

Keywords: Free cash flow; credit rating; financial variables.

1. Introduction

Corporate credit default risk is a significant concern for financial institutions and businesses. Credit default risk has significant consequences for the stability of financial institutions and the operations of businesses as the global economy and financial markets get more intricate. Credit defaults can cause financial institutions' balance sheets to deteriorate, potentially sparking a financial crisis with significant repercussions for the entire economic system. limitations, Credit defaults in organizations can result in disrupted capital chains, operational limitations, and even insolvency and liquidation, significantly impacting their growth and viability.

The financial factors of a company significantly influence the company's credit default risk. Flow Financial indicators are crucial for evaluating an enterprise's financial health and operational effectiveness, providing insights into its solvency, profitability, cash flow, and other key factors. Poor financial indicators in an enterprise, such as high debt, low profitability, and fluctuating cash flow, theoretically raise the chance of enterprise default.

Key financial indicators include gearing ratio, current ratio, quick ratio, interest coverage multiple, sales revenue growth rate, net profit growth rate, and operating cash flow. If the values of these indicators are low or unstable, it indicates that the financial position of the firm is weak, and the enterprise may face the danger of credit default. This research aims to demonstrate that alterations in corporate financial metrics directly influence the likelihood of credit default in businesses using data analysis.

Examining business financial indicators is crucial for mitigating the risk of credit default. Financial indicators are crucial for assessing an enterprise's financial status. Analyzing the correlation between financial indicators and credit default risk can assist financial institutions in accurately evaluating the credit risk of borrowing enterprises, thereby preventing credit defaults effectively. By utilizing financial indicators to monitor and evaluate their financial status, enterprises can identify potential credit default risks promptly and implement effective strategies to address them. This process enhances their credit ratings, facilitates borrowing and financing, and fosters the healthy and stable growth of enterprises.

2. Literature Review

Edward stated that corporate credit default risk is the probability of a company not being able to fulfill its debt commitments, which could result in financial trouble or bankruptcy [1]. Various factors influence the likelihood of corporate credit default. Merton highlighted that a company's financial decisions influence credit risk [2]. Financial health and market circumstances are the primary variables influencing this risk. Edward asserted that corporate credit default risk affects both the financial health and growth of the company and can also influence the general stability of the financial market [1].

Key business indicators consist of asset liability ratio, solvency ratio, and operating profit margin. These financial indicators help assess a company's financial health and forecast its likelihood of defaulting on financing. Altman's Z-score model uses various financial variables to forecast a company's likelihood of bankruptcy by computing a holistic score. Financial indicators serve the purpose of forecasting the future likelihood of firms going bankrupt, which is highly important for investors and creditors. Stephen highlighted that financial metrics might indicate a company's operational and financial performance. Analyzing the trends and levels of these indicators allows for evaluating the profitability, debt repayment ability, and growth potential of the firm [3].

Studies have demonstrated a strong connection between financial metrics and the likelihood of a company defaulting on its credit [4, 5]. Indicators like the asset liability ratio, solvency ratio, and profitability index have been shown to be significantly correlated with the credit default risk of businesses. Altman's Z-score model and Ohlson's O-score model are often used predictive models for assessing corporate credit default risk and have demonstrated some level of predictive accuracy [6]. The algorithms rely on many financial factors to forecast the future probability of bankruptcy for businesses. Many studies used past financial data for analysis, which might reduce the forecasting accuracy of models, particularly when market conditions shift [7, 8]. Predictive models are typically constructed based on particular assumptions and conditions that may not align with real-world scenarios, hence impacting the model's practicality. This study can explore a wider range of data sources and enhance and broaden the models based on the findings and limits mentioned above.

3. Methods

3.1. Data Source

The study primarily utilizes data sourced from Kaggle, a publicly accessible data discovery platform, and credit records can be obtained through collaboration with financial institutions or access to publicly available data. The author uses the enterprise's credit rating to symbolize the specific enterprise credit risk coefficient in the context of enterprise credit risk. Prior to data processing, it is essential to clean the obtained data by addressing missing values, outliers, and other anomalies. Pre-processing activities like variable transformation and standardization are conducted to enhance the quality and usability of the data. The author utilized the data analysis package SPSS AU to analyze the provided data in an integrated manner with random forests.

3.2. Indicator Selection and Explanation

The chosen variables for this study are corporate financial indicators and business credit risk, namely corporate credit rating. Corporate financial indicators may encompass liquidity measurement ratios (such as current ratio, quick ratio, and cash ratio), profitability indicator ratios (like assets, net profit margin, and gross profit margin), and debt ratios (including debt ratios and debt-equity ratios). The variables were chosen for their significance and relevance in evaluating the financial well-being and creditworthiness of companies (table 1).

Table 1. Variable introduction

Name	Minimum	Maximum	Mean	Standard deviation	Median
currentRatio	0.495	5.715	1.515	0.898	1.280
quickRatio	0.078	125.950	2.253	12.522	0.822
cashRatio	0.005	2.080	0.342	0.426	0.173
netProfitMargin	-2.117	33.810	0.480	3.584	0.060
grossProfitMargin	0.071	1.000	0.470	0.339	0.287
debtRatio	0.255	1.390	0.699	0.232	0.690
debtEquityRatio	-14.712	990.205	13.830	100.213	1.722

3.3. Method Introduction

The author used the learning integration approach of random forest in this study to examine the influence of corporate financial indicators on corporate credit risk. A regression model is developed to analyze the correlation between corporate financial indicators and credit risk. The model is chosen based on the research objectives and data, while controlling for other potential influencing factors. Model construction and validation are then conducted.

The aforementioned design allows for a full and in-depth exploration of the relationship between corporate financial indicators and corporate credit risk, offering theoretical support and practical assistance for financial risk management and corporate financial management.

4. Results and Discussion

In the empirical part of this paper, we will delve into the correlation between corporate financial indicators and credit default risk. We will analyze the results of the empirical investigation and conduct a comprehensive analysis to test the research hypotheses.

4.1. Descriptive Analysis

By performing descriptive row statistics for the dataset, we gain insight into the distribution of each financial indicator such as mean, standard deviation, maximum and minimum values. This helps in the initial assessment of the overall financial performance of the companies in the dataset.

Modeling Random Forest with item current Ratio, quick Ratio, cash Ratio, days Of Sales Outstanding, net Profit Margin, pretax Profit Margin, gross Profit Margin, operating Profit Margin, return On Assets, return On Capital Employed, return On Equity, asset Turnover, fixed Asset Turnover, debt Equity Ratio, debt Ratio, effective Tax Rate, free Cash Flow Operating Cash Flow Ratio, free Cash Flow Per Share, cash Per Share, company Equity Multiplier, ebit Per Revenue, enterprise Value Multiple, operating Cash Flow Per Share, operating Cash Flow Sales Ratio, payables Turnover as the independent variable and Rating as the dependent variable, it can be seen from the table above that a total of 100 samples were involved in the analysis. Here are three charts for one of these variables. Figure 1 below illustrates this rating does not conform to a normal distribution. Figure 2 below shows that there is no linear relationship between current ratio and rating. Figure 3 below illustrates the current ratio is concentrated between 1 and 2.

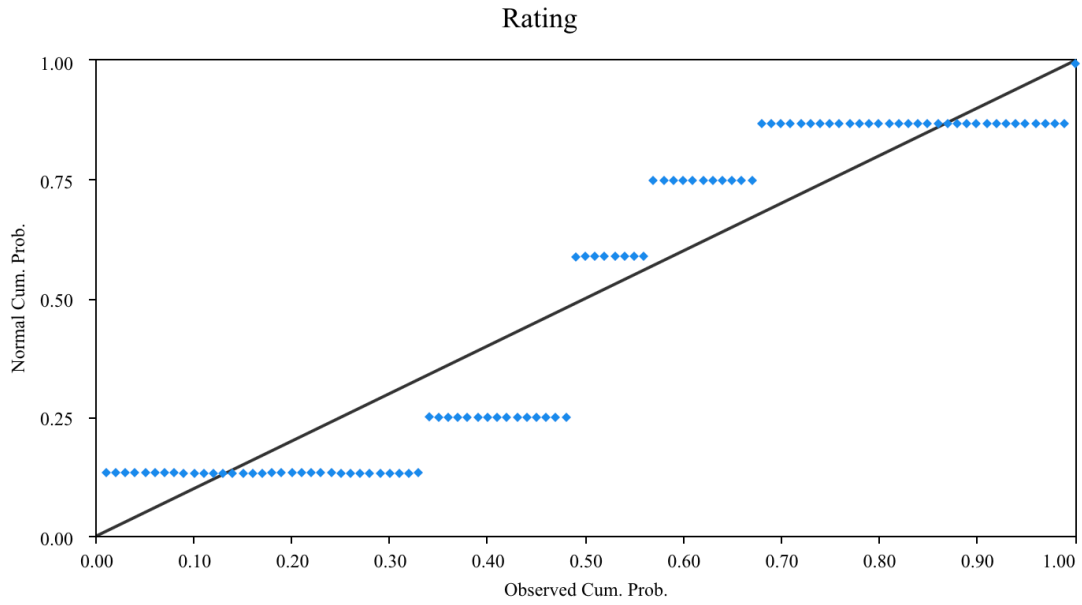


Fig. 1 Plot of PP/QQ

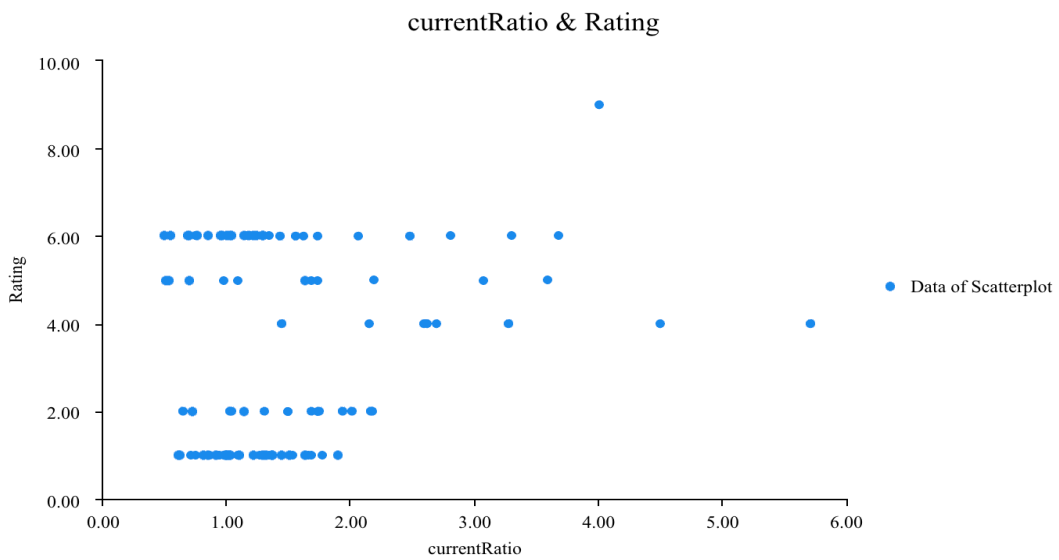


Fig. 2 Plot of Scatter
currentRatio

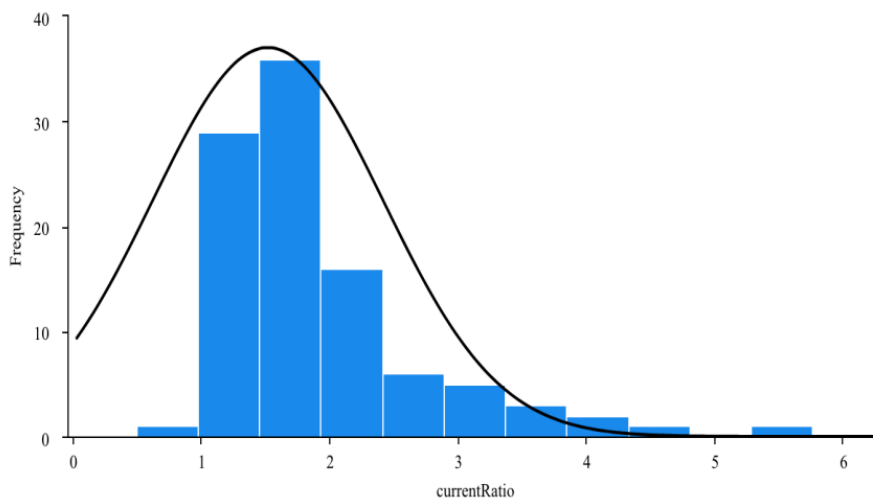


Fig. 3 Histogram of current ratio

4.2. Model Results

We will assess the fit of the research model by analyzing and interpreting the dataset using the Learning Integration Method of Random Forest. We will assess the model's residuals, goodness of fit, and other metrics to verify its ability to accurately describe the link between financial indicators and credit default risk (Figure 4).

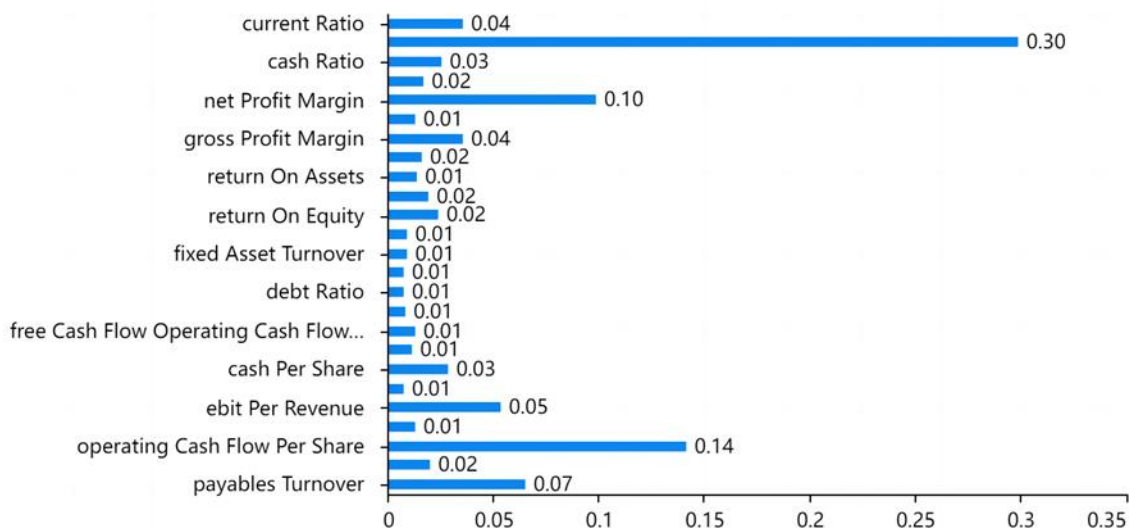


Fig. 4 Plot of Random forest results

Each feature's weight signifies its contribution to the model's relevance, with a total sum of 1. Figure 4 above illustrates the following: The Cash ratio carries a weight of 29.94% nearly 30%, the highest in the model. Cash flow from operations per share holds a weight of 14.19%, while the net profit ratio is weighted at 9.93%. Cash flow turnover per share also has a weight of 9.93%. The percentage of operating cash flow turnover per share is 9.93%. The weights assigned to several financial metrics are as follows: operating cash flow per share: 14.19%; net profit margin: 9.93%; accounts payable turnover: 6.53%; earnings per share: 5.36%; current ratio: 3.60%; and gross profit margin: 3.60%. The combined weight of the seven traits mentioned is 73.15 percent, whereas the weight of the other 18 characteristics is less than 3 percent. Zhao and Sun stated that operating cash flow is a crucial indicator for evaluating a company's financial performance in its primary business operations. essential benchmark [9, 10]. This illustrates that operating cash flow plays a very important role in enterprise financial indicators. Combined with the above weighted quick ratio, operating cash flow, and so on for a total of seven financial indicators, we can conclude that changes in financial indicators have a definite impact on the enterprise credit risk.

5. Conclusion

First of all, the author confirms that corporate financial indicators have a considerable impact on credit default risk. Through empirical research, this paper finds that key financial indicators, such as quick ratio and operating cash flow per share, are directly associated with the credit default risk of firms. This further illustrates that the financial position of firms has a direct impact on their credit risk.

Second, the author gives credit risk management guidelines for financial institutions and organizations. This paper advises that financial institutions should focus on the performance of financial indicators when assessing corporate credit risk, detect potential credit default risk early, and take suitable actions for risk mitigation and management. For firms, tis paper proposes that they should strengthen the monitoring and assessment of financial indicators, identify and address risk areas promptly, improve credit ratings, and support the healthy and stable development of enterprises.

In summary, corporate financial indicators have a substantial impact on credit default risk, and through in-depth study and analysis, people can better analyze and manage corporate credit risk and encourage the sound development of financial institutions and organizations.

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