The Micro-Determinants of Credit Spreads

ECO375: Empirical Project

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1 Introduction

Finding the micro-determinants for credit bonds is useful for finding what affects yields over time. The yield that investors require to purchase a firm's bond is the spread over the yield provided by a comparable government bond. Micro-determinants are variables taht are related to the probability of default and the liquidity associated with a specific bond issue. This project seaks to assess the importance of firm specific factors in determining the spread for its bonds. The data used covered two points in time: 2022 and 2024. The model is a cross-sectional problem focusing on the changes in spread from 2022 to 2024. Fixed effects were not included as these were not vary across bonds.

This paper is structured as follows: Section **??** is the literature review situating the research question, Section **??** contains the preliminary analyses, Section **??** contains the methodology, Section **??** contains the results, and Section **??** has the hypothesis testing.

difference in percentages: basis points

1.1 Description of variables

The variables are as follows

Variable	Description
Issuer	Name of the company that issued the bond
Spread	The difference between the bond's yield and the yield on a government bond of the same maturity. Measured in bps
Ticker Parent	Identifier for the parent company
Enterprise Value to Sales	Measures how expensive a company is relative to its revenue
Enterprise Value to PPE	Measures valuation relative to tangible assets
Price to Sales	How much investors pay for $1 of revenue
Price to Book Value	Measures how expensive the firm is relative to accounting equity
Dividend Yield	Return shareholders receive from dividends
Return on Average Total Equity	How efficient the firm is with investments
Operating Margin	Core profibility measure
Total Capital Expenses to Total Assets	How much firm invests in long-term assets
Book Value per Share	Accounting value per share
Asset Turnover	Measures how well assets generate revenue
Current Ratio	Measures short-term liquidity

Variable	Description
Cash Dividend Coverage Ratio	Measures if firm can pay dividends purely from operations
Total Debt to Equity	Measures financial leverage
Total Debt to Total Capital	Shows how much of capital is from debt
Amount Outstanding	Size of the bond
Years to Maturity	Number of years until the bond pays back its principal
Coupon	Annual payments made to bond holders

Enterprise value to sales measures how expensive a company is relative to its revenue. Thus, a high ratio means the market expects high growth (or the company is overvalued). Thus, a high enterprise value to sales means lower perceived risk and lower spreads.

PPE is tangible long-term assets. Thus, a high enterprise value to PPE means the firm is growth-oriented, but that also means has more risk and higher spreads.

A high Price to Sales signifies higher confidence in the firm by the general public which indicates lower spreads.

Price to Book Value is how the firm is valued by the general public. A lower ratio indicates undervaluation which produces financial distress and higher spreads.

Divident yield is how much bond holders are receiving from the dividents. A higher ration may indicate higher risk.

A higher Return on Average total equity indicates the firm is more efficient which means lower spreads.

The operating margin shows how much earnings are received before interest and taxes. A higher margin indicates the firm has a lower risk of going default which means lower spreads.

A high total capital expenses to total assets could indicate either lower spreads or a lack of liquidy.

A low book value per share may indicate the firm is close to going default and thus have a higher spread. A high asset turnover indicates the efficiency which implies lower spreads

A low current ratio indicates liquidity risk which implies higher spreads.

A low cash dividend coverage ratio indicates weak cash flow which implies higher spreads

A high total debt to equity means the firm has a high reliance on debt which implies higher spreads

1.2 Statement of hypothesis/research question

The research question this paper will seek to answer is what are the micro-determinants of credit spread. We propose that total debt to equity, price to book value, return on average total equity, and current ratioare the micro-determinants affect the change in bond spreads over time.

2 Literature Review

In 2020, Fu et. al employed a multi-factor analysis from both a firm-specific and market-specific perspective to examine the determinants of credit spreads in the USA, the UK, and Japan between 2005 and 2012. Their results indicated that the degree of firm leverage has a siginificant influence on spreads. They mention re-testing the influence of leverage on spreads, "as done in earlier work of Collin-Dufresne e"

Total Debt to Equity + Total Debt to Total Capital Fu, Li, and Molyneux (2021) "we assess the existence of a firm leverage effect" "firm leverage appears to have a significant influence"

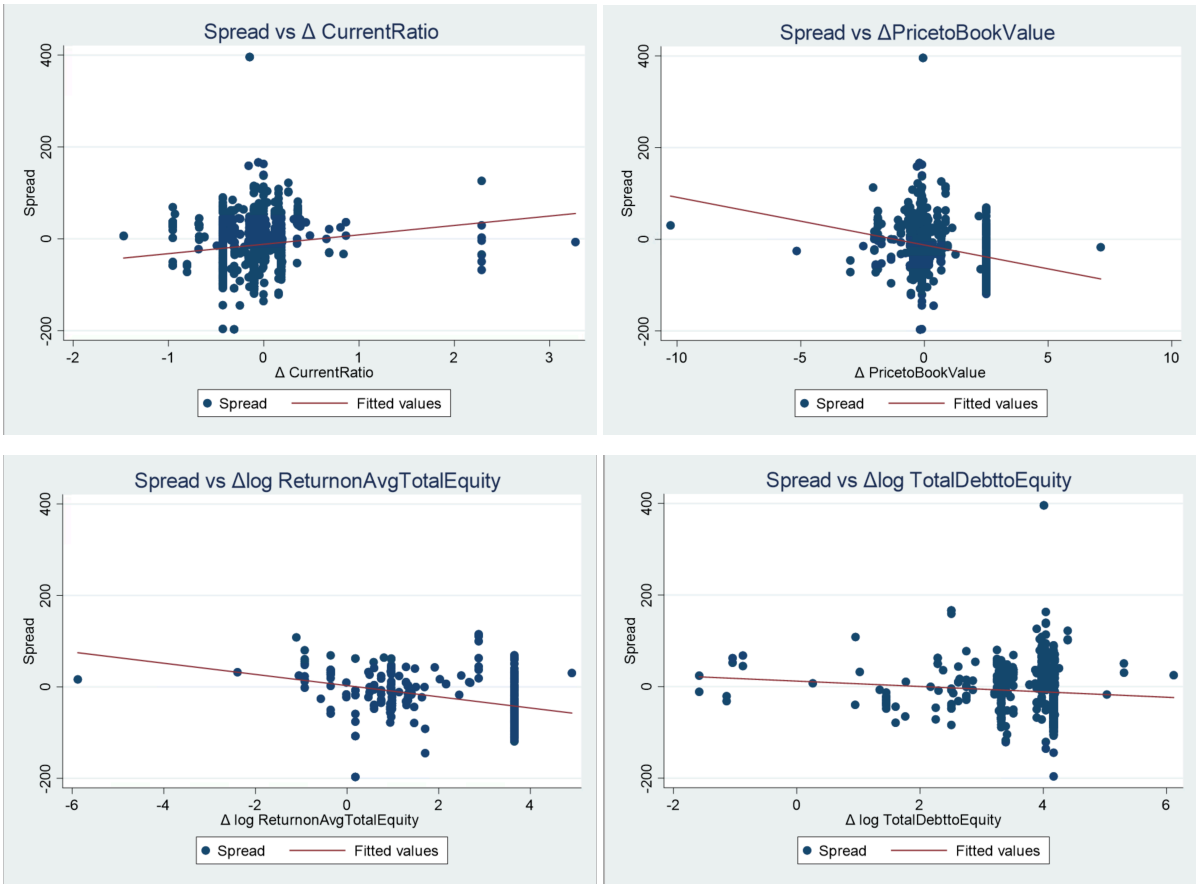
Wang (2023) ROE "Return on net assets… the higher the ROE, the better the operating conditions and the ability to service debt." higher -> lower spreads Current Ratio ""The higher the current ratio, the better the ability to service debt…the smaller the credit spread." "

Kaviani et al. (2020) Operating Margin ""…operating income-to-sales ratio…"

Carvalho, Gao, and Ma (2023) Price to book value (Market-to-book) ""Borrower-level controls include Equity Volatility, Size, Firm Age, Profitability, Tangibility, Market-to-Book, Leverage, Rated." " amount outstanding (loan amount) "I define the net notional amount of credit risk outstanding for a given firm as: NOf,t is analogous to the face value of debt outstanding in bond markets—it captures the net amount of protection sold…" Years to maturity (loan maturity) "…a firm is defined as a combination of the underlying firm (e.g. Ford) and a maturity bucket (e.g. 0-2 years)… The maturity buckets I consider are (in years): 0-2, 2-4, 4-6, 6-8, 8-10, and 10+."

3 Descriptive

3.1 Plots



3.2 Summary of key variables

Spread is numeric with a range from [-196.8, 395.8]. It had a mean of -14.6 and a standard deviation of 57.6. It had skweness of 1.017

PricetoBook Value is numeric with a range from [-10.3, 7.1]. It had a mean of 0.214 and a standard deviation of 1.17. It had skewness of 0.106.

Return on Average total equity was numeric with a range [-90.96, 135.03]. It had a mean of -0.47 and a standard deviation of 19.466. It had a skweness of 1.236.

Current Ratio is numeric with a range from [-1.47, 3.27]. It had a mean of -0.14 and a standard deviation of 0.395. It had a skewness of 2.86.