SUPPORTING INFORMATION FOR:

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Summary

This supporting information outlines the details of our implementation of yield spreads, term structure slope, liquidity measure, firm-level controls, and Merton model probabilities of default.

Supporting Information S1: Implementation details

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S1.1 Liquidity measure

We use price dispersion as introduced by Jankowitsch (2011) to proxy for the illiquidity of corporate bonds. The daily measure is defined as

$$Price\ Disp. = \sqrt{\frac{1}{\sum_{k=1}^{K_{it}} v_{ikt}} \sum_{k=1}^{K_{it}} (p_{ikt} - m_{it})^2 v_{ikt}}$$

with K_{it} the number of traded prices p_{ikt} with trading volumes v_{ikt} and m_{it} the daily closing price. We take the average of all daily measures in a given month to arrive at our monthly measure of illiquidity.

S1.2 Firm-level controls

We retrieve stock market data from CRSP (Center for Research in Security Prices, 2025) for the period from 2016 to 2021 and calculate market capitalizations and annualized trailing 6-month stock price volatilities for all firms and days in our sample period. For financials, we follow the typical filter conventions to retrieve data from Compustat (Standard and Poor's, 2025), i.e., we filter for consolidated financial statement information in the industrial standard format reported in USD between 2016 and 2021. We calculate the operating income to sales ratio as EBITDA divided by net revenues. We calculate the leverage ratio as total debt (calculated as long-term debt plus debt in current liabilities) divided by the sum of total debt and market capitalization. The long-term debt to asset ratio is defined as long-term debt divided by total assets. We calculate the pretax interest coverage ratio as EBIT divided by interest expenses. As in Dick-Nielsen et al. (2012) and Blume et al. (1998), we control for the skewed distribution of this ratio using four dummy variables. The first dummy is set to the coverage ratio if it is less than 5 and 5 if it is above. The second dummy is set to zero if the coverage ratio is below 5, to the coverage ratio minus 5 if it lies between 5 and 10, and 5 if it lies above. The third dummy is set to zero if the coverage ratio is below 10, to the coverage ratio minus 10 if it lies between 10 and 20, and 10 if it lies above. The fourth dummy is set to zero if the coverage ratio is below 20 and is set to the coverage ratio minus 20 if it lies above 20 (truncating the dummy value at 80).

S1.3 Merton model probabilities of default

We use the Merton (1974) model to calculate risk-neutral implied default probabilities. To do that, we must assume that the total value of the firm V follows a geometric Brownian motion:

$$dV = \mu_V V dt + \sigma_V V dW,$$

where μ_V is the expected return on the value of the firm, σ_V is the volatility of the firm's value, and dW is an increment of the standard Wiener process. Under the assumption that the firm has issued a single zero-coupon bond of amount D (constructed as short-term debt plus 0.5 times long-term debt, see Xia & Zulaica, 2022) and with maturity T (assumed to be five years), the value of the firm's equity E can be calculated from the Black-Scholes option pricing formula as the price of a call option like this:

$$E = V\Phi(d_1) - e^{-rT} D\Phi(d_2), \qquad with$$

$$d_1 = \frac{ln(V/D) + (r + 0.5\sigma_V^2)T}{\sigma_V^2 \sqrt{T}}, \qquad d_2 = d_1 - \sigma_V \sqrt{T},$$

where r is the risk-free rate and $\Phi(\cdot)$ is the cumulative standard normal distribution function. We draw the value of equity from CRSP market capitalization, the amount of debt from Compustat, the risk-free rate from FRED (daily constant maturity 1-year treasury rate; Federal Reserve Bank of St. Louis, 2025), and assume T to be five years. Thus, there remain two unknowns in this equation, i.e., σ_V and V. The typical way to solve this is to use Ito's Lemma and the call delta $\delta E/\delta V = \Phi(d_1)$ to derive the following relationship between σ_V and V and facilitate a solution to the resulting system of equations:

$$\sigma_E = \left(\frac{V}{E}\right)(d_1)\sigma_V$$

As Xia and Zulaica (2022), however, we follow Gilchrist and Zakrajsek (2012) and Bharath and Sumway (2008) to employ an iterative procedure that is more flexible if a firm's volatility is highly time-varying. The procedure includes six steps:

1. For each day a stock is traded, we gather the returns and market capitalization of the trailing 250 days.
2. We calculate the 250-day trailing equity volatility from these returns and derive the following initial estimate of σ_V: $\sigma_{V,initial} = \sigma_E * E/(E + D)$.
3. For each of the 250 trailing days, we solve the Black Scholes equation for V using $\sigma_{V,initial}$.
4. We calculate the daily log return on V for the 250 days in the trailing window.
5. We calculate the average and standard deviation of these returns.
6. We use the average and standard deviation as the new estimates for r and σ_V and iterate this procedure until the results of iterations converge (i.e., they change less than 0.01 compared to the previous result)

The procedure is relatively resource-intensive; however, most results converge after 3-5 iterations. The result is an estimate of σ_V and V for each stock-day observation. This can then be used to estimate risk-neutral default probabilities for each stock-day-observation as follows:

$$PD = \Phi\left(-\frac{ln(V/D) + (r - 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}\right)$$

The distribution of estimated default probabilities is highly skewed – as expected – with few observations with high default probabilities and the majority of default probabilities below 5% (see Figure S1.1). This distribution is similar to that of Bloomberg's physical default probabilities.

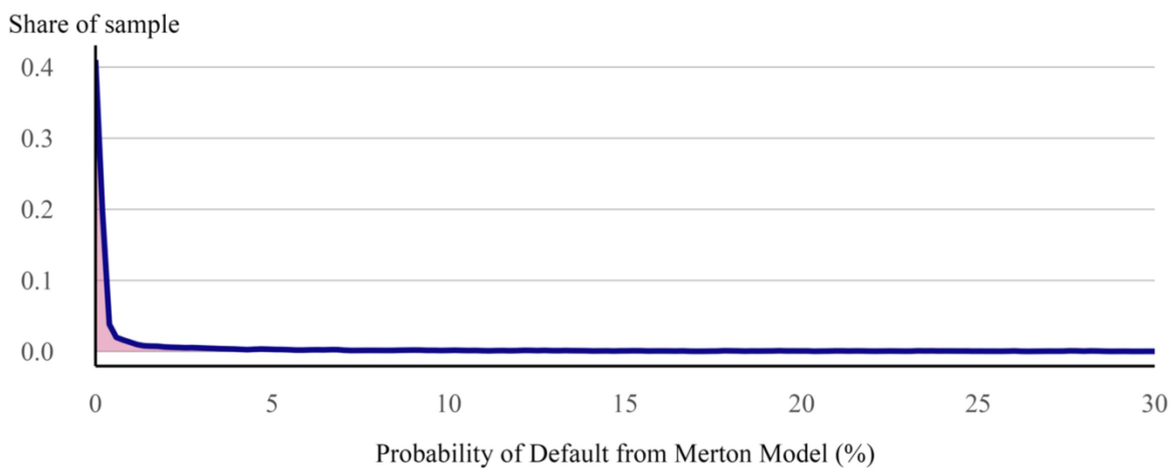

Figure S1.1 Distribution of Merton model risk-neutral probabilities of default.

S1.4 Sample distribution by rating class

Table S1.1 Sample distribution.

Rating class	Number of observations	Share of observations in %
AAA/AA	13,061	6%
A	73,865	35%
BBB	107,090	51%
BB	11,636	6%
B	3,456	2%
Below B (excl.)	466	0%
Total	**209,572**	**100%**

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