The Corporate Supply of (Quasi) Safe Assets

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Summary

This paper presents evidence that firms actively respond to relative misvaluation of publicly traded debt. I introduce the cross-basis as a measure of debt misvaluation. Let the bond-CDS basis be the difference between the credit spread and the CDS spread, *i.e.* the component of the credit spread which is not explained by credit risk. The cross-basis of a firm is defined as the difference between the cross-sectional average of the bond-CDS basis in the market and the bond-CDS basis of the firm. I show that the cross-basis forecasts bond issuance and equity payout, and does not forecast real investment. The evidence is consistent with a model in which investors value liquidity and safety in financial assets and firms can act as liquidity providers by issuing securities that provide those non-pecuniary services.

The Premium for Safety: Demand

Investors value liquidity and safety embedded in all securities.

$$S_t = q_{T,t} + \sum_{i \in IG} \alpha_i q_{i,t} + \sum_{i \in HY} \alpha_i q_{i,t} \tag{1}$$

The total non-pecuniary services in the economy is denoted as S. A dollar of treasuries provides a quantity α_T of this service, which is normalized to 1 and $1 > \alpha_{IG} \geq \alpha_{HY} \geq 0$.

Similar to [1] and [2] investors maximize a utility function:

$$\max_{\{c_t, Q_t\}_{t=0}^{\infty}} \quad \mathbb{E}\left[\sum_t \beta^t \left[U\left(c_t\right) + \theta_t \nu(S_t)\right]\right] \tag{2}$$

$$s.t \qquad c_t + Q_t P_t \leq \omega_t + Q_{t-1} X_t \tag{3}$$

Where $\nu(S)$ is a reduced-form function for the utility from consuming total non-pecuniary services S, θ_t demand for safety shifter. Standard assumptions hold, $U' > 0$, $U'' < 0$, $\nu' > 0$ and $\nu'' < 0$.

From investors FOC, the price of any security i can be written as:

$$P_t = \underbrace{\mathbb{E}_t\left[M_{t+1} X_{t+1}\right]}_{\text{Discounted Cash-Flow}} + \underbrace{\alpha_i \tilde{\theta}_t \nu'(S_t)}_{\text{Convenience Yield}} \tag{4}$$

The difference in the convenience yield between bonds gives rise to the bond-CDS cross-basis.

$$\begin{aligned} CrossBasis_{i,t}^{j} &= (y_{i,t}^{\tau} - CDS_{i,t}^{\tau} - y_{T,t}^{\tau}) - (y_{j,t}^{\tau} - CDS_{j,t}^{\tau} - y_{T,t}^{\tau}) \implies \\ &= (\alpha_i - \alpha_j)\theta_t \nu'(S_t) \end{aligned} \tag{5}$$

Fig. 1: **The cross-basis across ratings.** The cross-basis is calculated with respect to the market average basis. For each rating we report the average cross-basis.

Corporate Response: Supply

Equity holders optimally choose the firm levels of investment, debt and equity issuance to maximize the expected equity value of the firm. Variables are subject to the budget equation

$$\begin{aligned} D_t = &\underbrace{\Pi_t(K_t; x_t, z_t) - I_t(K_t, K_{t+1})}_{\text{CF to Operations}} + \underbrace{P_t B_{t+1} - B_t}_{\text{CF to Debt}} \\ &- \underbrace{\Psi(B_{t+1})}_{\text{Cost to Issue Debt}} - \underbrace{\Lambda(E_t)}_{\text{Cost to Issue Equity}} \end{aligned} \tag{6}$$

Note that the price of debt is defined as in Equation (4). The value of the firm is defined by

$$V_t = \max\left(0, \mathbb{E}_t\left[\sum_{k=0}^{\infty} M_{t,t+k} D_{t+k}\right]\right), \tag{7}$$

For illustration, the figure bellow shows how a constrained firm reacts to variation to basis in a two period model.

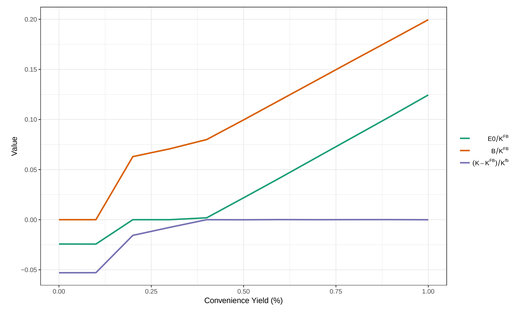

Fig. 2: **Corporate Response to Variation in the Basis.**

Results: Effects on Debt Issuance

I estimate the following empirical model:

$$y_{i,g,t+1} = \Phi\left(\beta CrossBasis_{i,g,t} + \gamma X_{i,g,t} + \alpha_i + \alpha_t + \varepsilon_{i,g,t}\right) \tag{8}$$

Let i be the firm, g the rating group and t time. y is firm level output. $CrossBasis$ is the spread between the market basis and firm level bond-CDS basis. Firm level bond-CDS basis is the average of firm's bond specific *basis* weighed by amount outstanding. Controls include firm level CDS spread, Tobin's Q, log(LagTotalAssets) and cash normalized by lag assets. I use quarterly data from January 2003 to December 2017.

	Dependent variable:								
	Net Debt Issuance Dummy						Net Debt Issuance as % lag assets		
	Logit			Linear Prob.			Intensive Margin		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cross-basis	0.284***	0.184***	0.209***	0.017***	0.013***	0.015***	0.625***	0.424**	0.365**
	(0.043)	(0.048)	(0.058)	(0.004)	(0.004)	(0.005)	(0.134)	(0.174)	(0.153)
CDS-spread	−0.071**	−0.148***	−0.020	−0.003	−0.012***	0.0004	−0.587***	−0.688***	−0.322**
	(0.029)	(0.033)	(0.043)	(0.003)	(0.003)	(0.003)	(0.099)	(0.109)	(0.130)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	No	Yes	No	No	Yes	No
Firms FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	11,703	11,703	11,703	11,703	11,703	11,703	2,245	2,245	2,245
R^2				0.039	0.050	0.111	0.098	0.137	0.401
Adjusted R^2				0.039	0.045	0.080	0.096	0.112	0.294
Note:									*p<0.1; **p<0.05; ***p<0.01

Tab. 1: **Main Results - Effect of Cross-Basis on Debt Issuance.**

Results: Effects on Real Investment

The cross-basis forecasts net debt issuance. Can it also forecast firms' real investment, equity payout and cash holding changes? Are the results different for financially constrained and unconstrained firms?

	Dependent variable:			
	CAPEX	R & D	Equity Payout	Cash Growth
	(1)	(2)	(3)	(4)
Cross-basis	0.050	0.005	0.162**	0.004
	(0.042)	(0.015)	(0.064)	(0.219)
CDS	−0.127***	−0.004	−0.124**	−0.099
	(0.034)	(0.012)	(0.049)	(0.122)
Controls	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Firms FE	Yes	Yes	Yes	Yes
Observations	2,245	2,245	2,245	2,245
R^2	0.855	0.820	0.528	0.365
Adjusted R^2	0.823	0.781	0.426	0.228
Note:				*p<0.1; **p<0.05; ***p<0.01

Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Cross-basis	12,162	0.059	0.949	−17.264	−0.180	0.448	4.831
Basis	12,162	1.144	1.193	−0.822	0.524	1.379	22.532
CDS-spread	12,162	1.316	1.327	0.057	0.486	1.659	16.896
Credit-spread	12,162	2.467	2.142	0.205	1.154	3.115	30.479
Net Debt Issuance Prob.	12,162	0.129	0.336	0	0	0	1
Net Debt Issuance (% lag assets)	12,162	0.474	2.131	−10	0	0	18
CAPEX(% lag assets)	12,162	1.275	1.254	0.018	0.497	1.597	12.574
R&D (% lag assets)	12,162	0.382	0.753	0.000	0.000	0.498	4.769
Equity Issuance (% lag assets)	12,162	0.590	1.392	−10.777	−0.030	0.903	12.793
Δ Cash (% lag assets)	12,162	0.182	3.136	−19.272	−0.893	1.244	29.883
Leverage Ratio	12,162	0.317	0.163	0.000	0.208	0.396	1.846

Conclusions

- Cross-basis can be interpreted as a premium investors are willing to pay for liquidity or safety services in debt securities.
- I show that firms respond to an increase in the cross-basis by issuing debt.
- In the extensive margin, one standard deviation increase in the cross-basis forecasts an increase of 1.4 p.p. of the probability of issuance. On average, this represents a relative increase of 10% of the probability of issuance.
- In the intensive margin, one standard deviation increase in the cross-basis forecasts an increase of 0.42 of debt as percentage of total assets. On average, this represents an increase of $78 millions in debt (face value).
- Even though cross-basis forecasts debt issuance, I do not find evidence it impacts real investment. Instead, for investment grade firms, I find that cross-basis forecasts equity payout.
- The evidence suggests that firms actively change their capital structure to benefit equity holders when there is a relative miss-valuation of debt securities. This result is consistent with the predictions of the structural model.

References

[1] James M. Poterba and Julio J. Rotemberg. "Money in the utility function: an empirical implementation". In: *New approaches to monetary economics* (1986), pp. 219–240.

[2] Adi Sunderam. "Money creation and the shadow banking system". In: *Review of Financial Studies* 28.4 (2015), pp. 939–977. ISSN: 14657368.