Discussion of: The cross-section of credit risk premia and equity returns (N. Friewald, C. Wagner and J. Zechner)

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Summary (1)

- **QUESTION of the paper:** Is credit risk priced in equity returns?

- Credit (or distress) risk measured by **expected excess CDS return**

$$\mathbb{E}_t^{\mathbb{P}}[\Delta S_{i,t+1}^T] - \mathbb{E}_t^{\mathbb{Q}}[\Delta S_{i,t+1}^T]$$

  where $\Delta S_{i,t+1}^T = S_{i,t+1}^T - S_{i,t}^T$ is CDS spread change of firm i for maturity T

- Low expected excess CDS return $\Longleftrightarrow$ high credit (or distress) risk

- The paper provides empirical evidence for a strong **positive link between equity excess returns and credit risk**

Summary (2)

INTUITION in the structural Merton (1974) model

Asset A_t

Debt D

Claim	Payoff
Equity	$(A_T - D)^+$
Bond	$\min\{D, A_T\}$
CDS	$D - \min\{D, A_T\} = (D - A_T)^+$

Sharpe ratio (SR) of CDS return = - SR of asset return = - SR of equity return

Summary (3)

- Empirical analysis on a merged CRSP/Compustat database, from January 2001 to April 2010
- Expected excess CDS return is estimated by regression on lagged forward rates
- Sort and group assets into 5 portfolios according to past expected excess CDS returns, from P_1 (highest credit risk) to P_5 (lowest credit risk)
- Average excess return of portfolio $P_1 - P_5$ is equal to

  2.91% (full sample)

  2.70% (pre-crisis)

  5.85% (crisis)

  Positive α in a 4-factor model
- Effects are more pronounced for small firms and value stocks

A few questions on the empirics

- Expected CDS returns under $\mathbb{P}$ are computed in analogy to Cochrane-Piazzesi methodology used for bond premia.

  Is this empirically motivated?

  Why not using a larger information set than lagged forward CDS rates?

- What is the intuition for the effect of credit risk on equity premium being stronger ...

  ... for small firms?

  ... for value stocks?

- Time pattern of returns of portfolio $P_1 - P_5$? Compare with other equity risk factors

Credit risk premium in a multi-factor model (1)

$R_{i,t}$ = excess return of **stock** of firm i at time t

$Y_{i,t}$ = excess return of **CDS** of firm i at time t (for given time-to-maturity)

$$R_{i,t} = \alpha_i + \beta_i' f_t + \delta_i Z_t + \varepsilon_{i,t}$$

$$Y_{i,t} = a_i + b_i Z_t + u_{i,t}$$

where

$$f_t = (MKT_t, SMB_t, HML_t, MOM_t)'$$

and

$$Z_t = \text{latent credit risk factor}$$

Credit risk premium in a multi-factor model (2)

By (asymptotic) no-arbitrage à la Chamberlain, Rothschild (1983)

$$E[R_{i,t}] \approx \beta_i' \lambda + \delta_i \mu$$

where μ is **equity risk premium associated with credit risk factor**

- Is the credit risk factor priced in equity returns, i.e. $\mu \neq 0$?
- How large is credit risk premium compared to premia of other factors ?

Credit risk premium in a multi-factor model (3)

Estimate the risk premia by a three-pass approach

1. Filter the latent credit risk factor Z_t from model

$$Y_{i,t} = a_i + b_i Z_t + u_{i,t}$$

to get $\hat{Z}_t$ (e.g. by principal components, Bai and Ng (2003) estimator)

2. Time series regressions of equity excess returns on factors:

$$R_{i,t} = \alpha_i + \beta_i' f_t + \delta_i \hat{Z}_t + \varepsilon_{i,t}$$

to get $\hat{\alpha}_i$, $\hat{\beta}_i$ and $\hat{\delta}_i$

3. Cross-sectional regression of average equity excess returns on estimated risk sensitivities:

$$\bar{R}_i = \hat{\beta}_i' \lambda + \hat{\delta}_i \mu + error_i$$

to get $\hat{\lambda}$ and $\hat{\mu}$

Credit risk premium in a multi-factor model (4)

For a later stage of the analysis:

- Time varying risk premia?

- Use portfolios vs. **individual stocks**

  Ang, Liu, Schwarz (2009), Gagliardini, Ossola, Scaillet (2010)

Understanding the distress puzzle ?

- Campbell-Hilscher-Szilagyi (JF 2008): financially distressed firms (i.e. with high expected **failure rate**) delivers anomalously **low** returns
- Important point of the present paper: results depend on the definition of distress !
- Understanding the distress puzzle likely requires **a structural equilibrium model**

  Tang, Yan (2006), Porchia, Trojani (2009), Gomes, Schmid (2010) Capponi, Larsson (2001)

  Lucas-type economy, representative agent with utility over consumption, output produced by defaultable firms financed through equity and bonds