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**

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

  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 \( \iff \) 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

<table>
<thead>
<tr>
<th>Claim</th>
<th>Payoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>$(A_T - D)^+$</td>
</tr>
<tr>
<td>Bond</td>
<td>$\min{D, A_T}$</td>
</tr>
<tr>
<td>CDS</td>
<td>$D - \min{D, A_T} = (D - A_T)^+$</td>
</tr>
</tbody>
</table>

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 $\alpha$ 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)

\[ R_{i,t} = \text{excess return of stock of firm } i \text{ at time } t \]

\[ Y_{i,t} = \text{excess return of CDS of firm } i \text{ at time } t \text{ (for given time-to-maturity)} \]

\[ R_{i,t} = \alpha_i + \beta_i f_t + \delta_i Z_t + \varepsilon_{i,t} \]

\[ Y_{i,t} = a_i + b_i Z_t + u_{i,t} \]

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 \( \mu \) 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

\[ Y_{i,t} = a_i + b_i Z_t + u_{i,t} \]

\[
\hat{Z}_t \text{ (e.g. by principal components, Bai and Ng (2003) estimator)}
\]

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

\[ R_{i,t} = \alpha_i + \beta_i f_t + \delta_i \hat{Z}_t + \epsilon_{i,t} \]

\[
\hat{\alpha}_i, \hat{\beta}_i \text{ and } \hat{\delta}_i
\]

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

\[ \bar{R}_i = \hat{\beta}' \lambda + \hat{\delta} \mu + \text{error}_i \]

\[
\hat{\lambda} \text{ and } \hat{\mu}
\]
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.


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