Discussion of Frailty Correlated Default


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What is the paper about

• Building a parsimonious model to predict a term structure of hazard rates for individual publicly traded companies, extending the work of Shumway (2001) and Duffie, Saita and Wang (2006)

• Adding a common dynamic frailty component and static unobserved heterogeneity to the mix, explicitly accounting for two kinds of misspecification of the basic model

• Estimating the model, using heavy-duty Bayesian econometrics (Monte Carlo EM and Gibb’s sampler)
The main conclusions

- Previously identified predictors of default remain statistically and economically significant, with largely unchanged coefficients:
  - Distance to default
  - Trailing one year stock return
  - Three month T-bill rate
  - Trailing 1-year SP500 return
- The common frailty factor, constrained to follow a constant volatility Brownian Motion, provides a good characterization of otherwise unexplained historical default clustering
- In sample, the effect of the common frailty factor is highly significant, scaling predicted hazard rates from observable covariates by ≈1.5 at the peak in 90-91 and ≈0.7 at the 95-97 trough
- The added default correlation accounted for by common frailty should not be ignored when estimating tail risk of credit portfolios, and analyzing the risk/return profiles of CDO tranches
What is the paper not about

• Pricing of bonds or credit default swaps
• Pricing of CDOs, or other default correlation products
• Why?
  – The analysis is entirely based on the historical “P measure”
  – Credit risk premia are generally thought to be high (not really a problem) and highly variable (a problem)
  – The presence of jumps means that we can not easily infer properties like correlation and volatility under “the Q measure” from corresponding properties under the “P Measure”
• … but, maybe all hope is not lost!
• The following should be worth about 3,000 words on the topic
The Scaled Y-factor

Figure 7 from the current paper
Carefully chosen credit spreads

- Time series of fitted spreads over Treasuries of senior unsecured US corporate and financial bonds without embedded options
- From Wu and Zhang (2005)
Another Credit Spread Puzzle?

- Lining up the relevant parts of the two previous pictures seems to suggest a pattern
- Remember: no spread data was used in the estimation of the frailty factor
Summary - I

• Based on gross data mining and ocular regression, I conclude that the estimated frailty is closely associated with average US corporate and financial Baa spreads

• Average Baa spreads are a plausible target:
  – Represent a large fraction of actively traded credits (e.g. roughly half of the investment grade CDX index)
  – Are relatively less influenced by liquidity effects than A rated and higher
  – Are less subject to rapid portfolio variation and the influence of single name blow-outs than the junk bond universe

• This is very encouraging from the perspective of extending the framework to pricing credit risk
A potential avenue for future research would be to model the risk premium associated with systematic default risk explicitly, and estimate the resulting model jointly on spread and default data.

Given “Q measure frailty”, one can test the model on index tranche pricing.

This would lead directly to a coherent modeling framework for single tranche bespoke CDO pricing.

…although numerical tractability would still be hurdle.