

Discussion of Frailty Correlated Default

Duffie, Eckner, Horel & Saita (2006)

Moody's Corporation & The Salomon Center, NYU Stern School of Business
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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

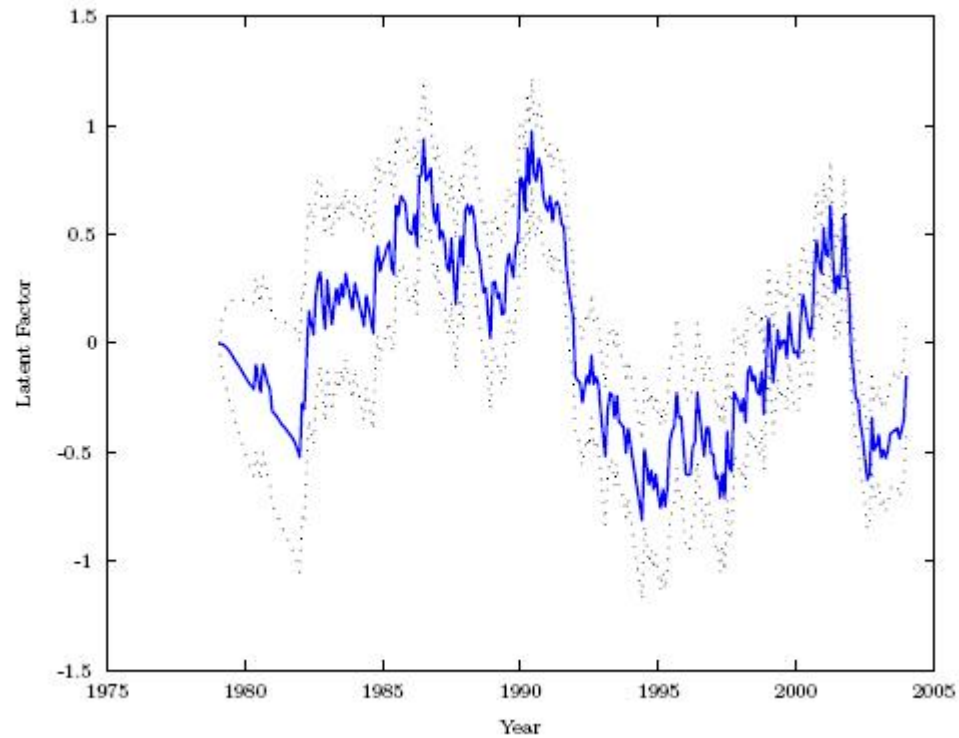
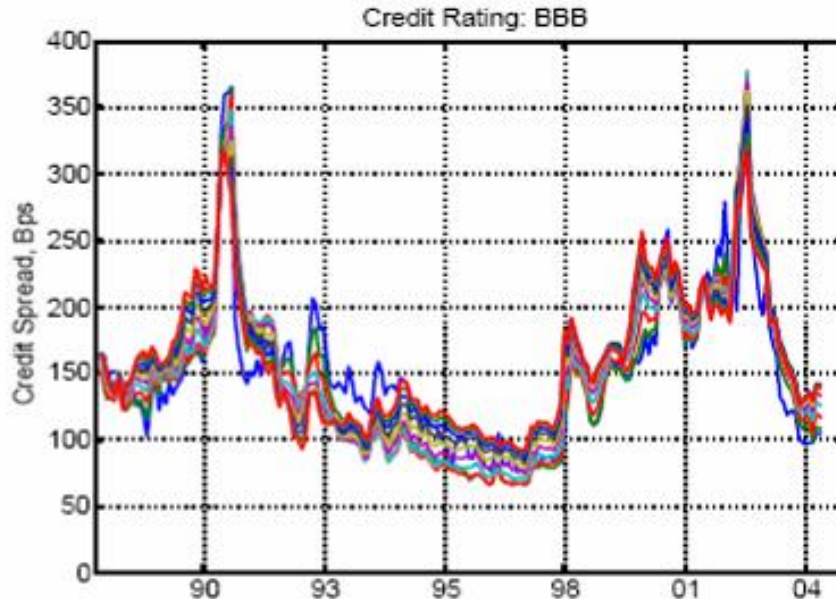


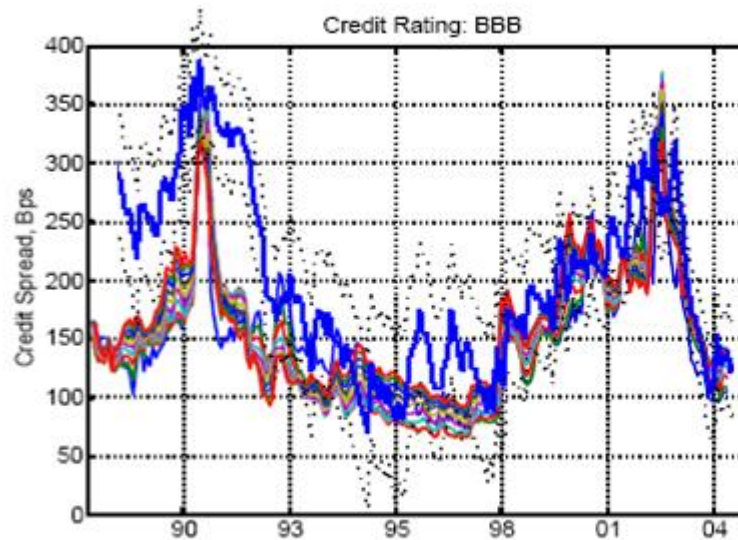
Figure 7 from the current paper

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

Summary - II

- 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