

3rd Financial Risks International Forum
Risk Dependencies. Paris, March 25 & 26, 2010

*Discussion of the paper
“Clustered Defaults”*





Discussion “Clustered Defaults”

- Deals with the dependence between default dates
 - *Bottom-up models*
 - Well-suited to analyze changes of portfolio allocation
 - *Top-down models*
 - Markov models for aggregate losses
 - Dependence through contagion effects : jumps in aggregate loss intensity at default times
 - It is not obvious to relate risks to portfolio structure
- Discussed model related to bottom-up approach
 - *Clustering comes (only) through simultaneous defaults*
 - *Can actually create huge dependence effects*
 - *For example, possibility of an Armageddon risk*
 - Such as clustering too many academics and credit people in same room



Discussion “Clustered Defaults”

- Many competing approaches for modelling dependencies
 - *Joint defaults : common shock models*
 - Starts from Duffie (1999), then Lindskog & McNeil (2003)
 - *Multivariate structural models*
 - CreditMetrics, Basel II, Moody’s KMV
 - *Correlated intensities*
 - Multivariate Cox processes
 - *Frailty models (Archimedean copulas)*
 - Hierarchical Archimedean copulas (partially nested)
 - *Gaussian copula*
 - Li (2000)
 - Remainder: beware, no comment about David Li and the Gaussian copula
 - Intra & inter sector correlations: X & X (2004)
 - *Factor copulas*
 - Associated with a wide range of dependence structures



Discussion “Clustered Defaults”

■ *Markov Copulae*

- Bielecki and co-authors
 - Check in that room
- In between top-down and bottom-up
- Small homogeneous portfolios may be considered as Markov
- Dependence comes from simultaneous defaults (related with paper?)

■ *GPL: Brigo et al.*

- Uneducated French might misunderstand GPL’s meaning
- Related with that paper?

■ No embedding framework

■ Large credit losses can also come from stochastic recovery rates

- “collateral damage”
- Consider a model with factor dependence
- Large homogeneous approximation with factor dependent recovery rate
- Change of mixing distribution for defaults or change recovery rates ?

Identification issue $\longleftrightarrow (1 - \delta(V)) p^{|V|}$

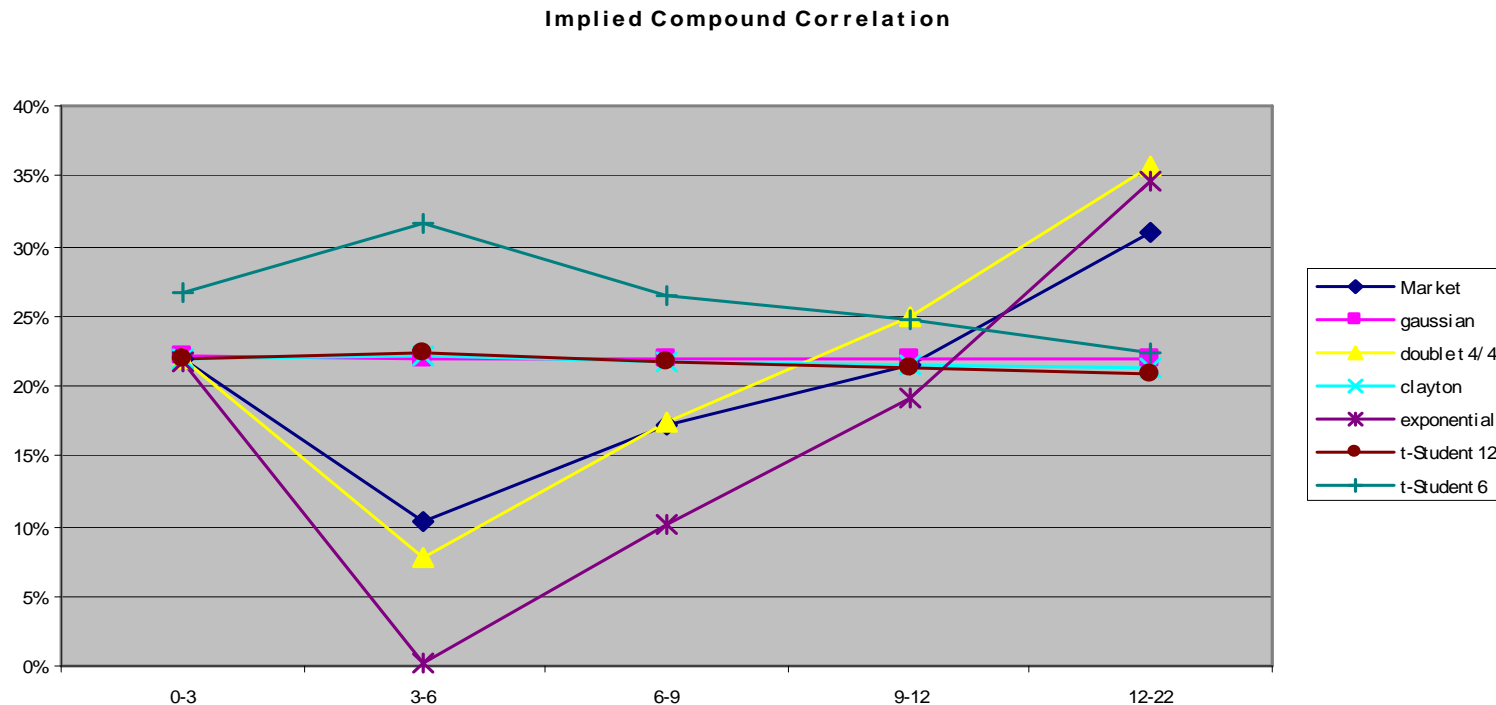


Discussion “Clustered Defaults”

- Dependence in large dimension
- Homogeneous portfolios (static case)
 - *De Finetti theorem*
 - *One factor*
- Partially exchangeable portfolios
- A number of ways to introduce sectoral effects
 - *Homogeneous sub-portfolios*
- Common shock model is rather well-known
 - *Multivariate exponential distributions*
 - *Marshall Olkin copulas*
 - *Within the factor copula framework*
 - *This eases CDO computations and model analysis*
 - Cousin & Laurent (2008), change in dependence parameters

Discussion “Clustered Defaults”

- *Common shock models developed for CDOs by Elouerkhaoui*
- *The model can be associated with very large dependence*
 - Much higher than Cox process models and even that frailty models
 - Allows to control for loss distributions (here small mezzanine tranches)





Discussion “Clustered Defaults”

- Properties of the common shock model
- Specifying the dependence structure
 - *Huge overfitting*
 - *n names can lead to 2^n intensities!*
 - *Checking model restrictions?*
- Dynamics of credit spreads
 - *No contagion effects*
- Dependence only due to simultaneous defaults
- Due to the large number of states, incomplete markets
 - *Requires more involved techniques to construct risk-mitigating dynamic strategies*



Discussion “Clustered Defaults”

- What are we looking at?
 - *Risk measurement*
 - At which time horizon ?
 - Need to account for rating migration, changes in credit spreads
 - (not only defaults)
 - Possible changes in the (local) correlation structure.
 - Static vs Dynamic
 - *CDO pricing*
 - *Investment grade names (100 names), medium size corporate portfolios, mortgages*
- Not the same inputs
 - *historical default data, recovery rates, definition of a default, credit spreads, ratings, bond prices, etc.*



Discussion “Clustered Defaults”

- Coping with Basel 2 “++”
 - *Capital requirements for CDS and CDO trading books*
 - *CRM : Comprehensive Risk Measure*
 - *Incremental Risk Capital Charge (IRC)*
 - *Stressed VaR : 99.9%, 1 Year time horizon*
 - *Must take into account dynamic hedging with CDO tranches, credit migration, credit spread volatility, stochastic correlation, stochastic recovery rates,...*
 - *Urgent action required (completion by end of year 2010)*
- Moody’s KMV, CreditMetrics and related packages are frontrunners
 - *How academic models will compete?*



Discussion “Clustered Defaults”

- Timing of defaults and default date definition
 - *Not that clear in the corporate world*
 - *Costly non-defaults, costless defaults*
 - *For example, is a bail-out a default?*
 - What has occurred to Merrill Lynch counterparties after BofA stepped-in?
 - Then, it is associated with a joint default event, together with Lehman
 - Prior to Bear Stearns bail out by JP Morgan, many counterparties transferred their OTC exposures to thirds parties
 - Novation: transfer rights and obligations to a third party
 - *“In the three weeks preceding Bear Stearns's collapse, Beep, Citadel and Paulson exited about 400 trades where Bear Stearns was the trading partner, more than any other firms did.”*
 - *Beep unloaded a number of swap contracts. Positions were transferred to a variety of players, including Lehman Brothers and Morgan Stanley.*



Discussion “Clustered Defaults”

- *(Almost) costless defaults : Fannie Mae Subordinated,*
 - Final price, 6th October CDS auction : 99.9
- Jarrow et al. (2008)
 - *Distressed Debt Prices and Recovery Rate Estimation*
- Large discrepancies between economic and recorded default dates
 - *Likely to be a major issue when dealing with the estimation of a model with simultaneous defaults*
 - *more problematic than in the case of no simultaneous defaults*
- Recovery rates also contribute to dependence between individual default dates