

Referee report on: Tail dependence of financial stocks and CDS markets – Evidence using copula methods and simulation-based inference

Summary

The paper aims to investigate the tail dependence between a stock index of European Financials and a basket of CDS's of these firms in periods of crisis. In particular the authors ask how and whether the relationship between credit risk and equity risk of banks changes in times of market stress. Another question the paper addresses is whether the tail dependency is time varying. While these are interesting questions, the execution is not very convincing. I have several comments.

Main Comments

1. On page 4 it is said that the data period is 2007-2012, but Figure 2 graphs data starting 2004. If one is to test non-crisis dependence and crisis dependence, I guess an even much longer period prior to 2007 is needed. Furthermore, if one wants to test the difference between the euro crisis and credit crisis episodes, this is another objective, as both were crisis period.
2. On page 6 residuals are estimated assuming a GARCH process. Subsequently, the dependency is investigated on these residuals. This poses the question whether those data are really proper (since these are estimated). In fact it has been shown that if a GARCH process with normal innovations is estimated, the residuals are still fat tailed due to estimation errors. For the same reason, these errors may still carry dependency that was to be removed by the GARCH filter. This possible bias has to be addressed.
3. In middle of page 6 it is reported that the univariate distributions are 'estimated' non-parametrically. Then the question is why one would estimate the (tail) copula parametrically, see the bottom page 6? A parametric copula is biased by what happens in the center of distribution (due to the wealth of observations in the center) and imposes a mold that may not fit. So if one is interested in tail dependency, why not proceed non-parametrically? This is potentially even easier, see the book by De Haan and Ferreira (2006) or Embrechts, Frey and McNeill et al. (2005, ch 7)? In this case one does not have to consider several alternative parametric forms.
4. Section 3 starts with measuring the quantile dependence. But nowhere is this concept defined, while this is crucial for the entire paper. Figures 2 and 3 are hard to interpret for this reason.
5. It is quite suspect that left and right tail confidence bands in Figure 2 are so widely different. Without knowing how these are constructed, we cannot understand why this is the case?
6. Page 9: The time variation in the rank correlation is certainly of interest. But is the i.i.d. bootstrap to test the symmetry of both sides of the sample on bottom of page 9 correct under this null?
7. Page 2, Table 5: The time varying normal copula somewhat automatically adapts to fat tails, so this is why the unconditional Student-t distribution does best. Why not let the Student-t be time varying to test for time variation. Since time variation may erroneously confuse for fat tails; see also page 12 bottom.
8. Bottom page 11: It is totally unclear what is meant by "the dependency structure is not concentrated in one of the tails but rather in the centre"?

Small remarks

1. Page 4: Entries (firms) in both indices did change during the credit and euro crises. How important is this effect? Was it possible to replicate these investments without making considerable extra losses due to entry and exit?
2. Page 10 bottom – 2 lines: Gumbel
3. Condense the abstract to 100 words; that provides focus.