Review of "Tail Dependence of Financial Stocks and CDS Markets – Evidence Using Copula Methods and Simulation-Based Inference"

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The authors use copula models to study global and caudal (tail) dependence between banks stock returns (EuroStoxx Banks 600 index) and CDS spreads of financial sector (iTraxx Europe Senior Financials 5Y TR index). The analyzed time frame encompasses a period of financial distress (the Subprime and the European sovereign debt crises). The authors conclude for symmetric dependence and equal caudal dependence between two markets, in contrast to what is predicted by Merton (1974) model – which suggest that in periods of financial distress stock returns and bond yields (or CDS spreads) are more correlated.

The authors present an interesting discussion of some empirical studies that relate stock returns with CDS spreads and bond yields, and provide an interesting explanation of the advantages of copulas in measuring correlation between assets in the context of extreme events.

Next, I provide some major and minor comments.

Major Comments

1. My main concern is the following. Copula models are fitted only for a period of financial distress, and then the tail coefficients are compared. Would not it make more sense estimating copula models also for a period of financial stability (prior to 2007), and then compare tail coefficients of estimated copulas for the stability period with tail coefficients of estimated copulas for the period of financial distress? I think in this way the conclusions to be drawn about the validity of the Merton (1974) model could be more robust.

2. In section 1 (Introduction), the authors could explain in more detail how analyzing the dependence between stock performance and CDS spreads allows one to draw conclusions about too-big-to-fail effect.

3. The authors could explain the economic interest of analyzing auto-covariance between stock returns and CDS spreads. Otherwise, the phenomenon of auto-covariance is only relevant for statistical purposes, namely for choosing the best model to fit the data, and therefore should not be part of the research questions.

4. Referring to Figure 2, the authors could explain in more detail how they performed the bootstrap simulation.

5. Section 5 shows the results of econometric procedures and does not discusses the implications of such results to the research questions. I think the authors could discuss the results at the end of section 5 and rename this section to "Results and discussion".

<u>Minor Comments</u>

6. In section 3 (Data Description), the authors could explain how many data points they used for the estimation procedure, and how they treated the information in the presence of holidays.

7. In section 4 (Methodology), the authors could mention some studies that suggest that stocks tend to crash together but not boom together.

8. Some of the variables of the equations presented on pages 4 and 5 are not defined. The authors could number the equations and explain the meaning of each variable.

9. On page 5, the rotated Clayton copula (or Survival Clayton) exhibits positive dependence, contrary to what is mentioned by the authors.

10. On page 6, when the authors mention the Student t copula, they suggest that t copula provides higher tail dependence than the normal copula. This is true, but I think it could be mentioned that tail coefficients of the normal copula are null.

11. On page 6, the authors could provide a brief description of the Symmetrised Joe-Clayton copula (SJC copula), similarly to what was done for the other copulas.

12. On page 9, the authors should replace "Gumble" with "Gumbel".

13. Figure 5 could be easier to read if the authors introduced a vertical line marking the beginning of European sovereign debt crisis.

Lisbon, November 2013,

Paulo Horta