

# Bayesian model selection of regular vine copulas

Lutz Gruber\*

[gruber@ma.tum.de](mailto:gruber@ma.tum.de)

---

Regular vine copulas can describe a wider array of dependency patterns than the multivariate Gaussian copula or the multivariate  $t$  copula. This paper presents the first fully Bayesian approach to model selection of regular vine copulas. Our reversible jump Markov chain Monte Carlo algorithm employs a mixture of different proposal distributions to optimize acceptance rates and obtain rapid convergence of the sampling chain. Another major contribution to the area of model selection of regular vine copulas is our algorithm's capability to estimate all levels of vine copulas simultaneously. The feasibility of our approach is demonstrated in a simulation study that benchmarks our algorithm against methods suggested in current literature as well as in a real data example of forecasting financial portfolio risk.

---

\*Technische Universität München, Zentrum Mathematik, Lehrstuhl für Mathematische Statistik, Boltzmannstrasse 3, 85748 Garching bei München, GERMANY.