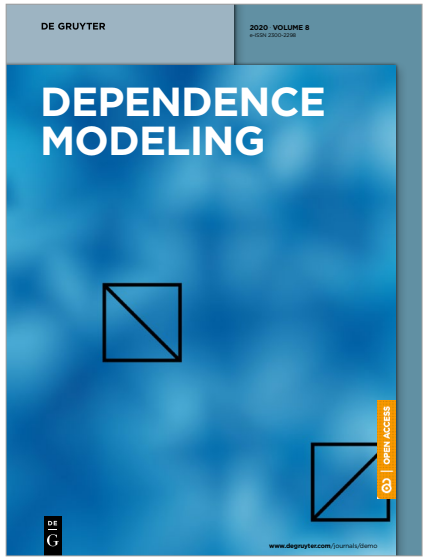

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FEATURED ARTICLES:

Bayesian credibility premium with GB2 copulas
by Himchan Jeong and Emiliano A. Valdez
Abstract: For observations over a period of time, Bayesian credibility premium may be used to predict the value of a response variable for a subject, given previously observed values. In this article, we formulate Bayesian credibility premium under a change of probability measure within the copula framework. Such reformulation is demonstrated using the multivariate generalized beta of the second kind (GB2) distribution. Within this family of GB2 copulas, we are able to derive explicit form of Bayesian credibility premium. Numerical illustrations show the application of these estimators in determining experience-rated insurance premium. We consider generalized Pareto as a special case.

Lorenz-generated bivariate Archimedean copulas
by Andrea Fontanari, Pasquale Cirillo and Cornelis W. Oosterlee
Abstract: A novel generating mechanism for non-strict bivariate Archimedean copulas via the Lorenz curve of a non-negative random variable is proposed. Lorenz curves have been extensively studied in economics and statistics to characterize wealth inequality and tail risk. In this paper, these curves are seen as integral transforms generating increasing convex functions in the unit square. Many of the properties of these "Lorenz copulas", from tail dependence and stochastic ordering, to their Kendall distribution function and the size of the singular part, depend on simple features of the random variable associated to the generating Lorenz curve. For instance, by selecting random variables with a lower bound at zero it is possible to create copulas with asymptotic upper tail dependence. An "alchemy" of Lorenz curves that can be used as general framework to build multiparametric families of copulas is also discussed.

Dependence uncertainty bounds for the energy score and the multivariate Gini mean difference
by Carole Bernard and Alfred Müller
Abstract: The energy distance and energy scores became important tools in multivariate statistics and multivariate probabilistic forecasting in recent years. They are both based on the expected distance of two independent samples. In this paper we study dependence uncertainty bounds for these quantities under the assumption that we know the marginals but do not know the dependence structure. We find some interesting sharp analytic bounds, where one of them is obtained for an unusual spherically symmetric copula. These results should help to better understand the sensitivity of these measures to misspecifications in the copula.

A new extreme value copula and new families of univariate distributions based on Freund's exponential model
by Sándor Guzmics and Georg Ch. Pflug
Abstract: The use of the exponential distribution and its multivariate generalizations is extremely popular in lifetime modeling. Freund's bivariate exponential model (1961) is based on the idea that the remaining lifetime of any entity in a bivariate system is shortened when the other entity defaults. Such a model can be quite useful for studying systemic risk, for instance in financial systems. Guzmics and Pflug (2019) revisited Freund's model, deriving the corresponding bivariate copula and examined some characteristics of it; furthermore, we opened the door for a multivariate setting. Now we present further investigations in the bivariate model: we compute the tail dependence coefficients, we examine the marginal and joint distributions of the componentwise maxima,which leads to an extreme value copula,which – to the best of our knowledge – has not been investigated in the literature yet. The original bivariate model of Freund has been extended to more variables by several authors. We also turn to the multivariate setting, and our focus is different from that of the previous generalizations, and therefore it is novel: examining the distribution of the sum and of the average of the lifetime variables (provided that the shock parameters are all the same) leads to new families of univariate distributions, which we call Exponential Gamma Mixture Type I and Type II (EGM) distributions. We present their basic properties, we provide asymptotics for them, and finally we also provide the limiting distribution for the EGM Type II distribution.

The gentleman copulist - An interview with Carlo Sempi
by Christian Genest and Matthias Scherer

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