

Factor copula models for multivariate data

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Abstract

When there are a large number of observed variables, factor copula models have been proposed [1–3], where observed variables are conditionally independent given one or more latent variables. Conditional independence relations lead to parsimonious dependence models for a large number of response variables. Factor copula models are truncated vine copula [4] models that involve both observed and latent variables, hence they allow flexible tail dependence [5]. These types of models are more interpretable and fit better than vine copula models, when dependence can be explained through latent variables. That is theoretical concepts that cannot be measured directly such as intelligence in psychology, or welfare and poverty in economics. Computing techniques for maximum likelihood estimation will be mentioned, an application on measuring the latent variable ‘financial wealth of the household’ in its different realizations by analysing seven household variables of 9,660 respondents to the Swiss consumption survey [6] will be presented, and it will be shown that there is a substantial improvement on existing models both conceptually and in fit to data.

References

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