Invariant multivariate dependence structure under univariate truncation

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Abstract. The interest in the construction of multivariate stochastic models describing the dependence among several variables has grown in the last years. In particular, the recent financial crisis has underlined the necessity of considering models that can serve to estimate better the occurrence of extremal events. Indeed, the crucial interest in modelling the real world phenomena often lies in the proper description of the evolution of dependency between different factors when one of them is achieving the extreme values. Copulas are the most general measures of dependence. Hence, it is convenient to state the results in copula based language.

Following the approach proposed in [2], the first step is to study copulas invariant under univariate conditioning i.e. copulas C, such that if C is the copula of the random vector $X = (X_1, \ldots, X_{n+1})$, then C is also the copula of X supposing that X_1 is smaller than its α quantile.

The complete characterization of bivariate invariant copulas is given in [1]. In my talk I am going to extend these results for multivariate copulas. Specifically, I will characterize the $n+1$-dimensional copulas invariant under the conditioning of the first variable X_1 in terms of the conditional n dimensional copula of $(X_2, \ldots, X_{n+1})$ under the condition $X = x$ and bivariate marginal copulas of pairs (X_1, X_i), $i = 2, \ldots, n+1$.

References

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