## On the structure and estimation of hierarchical Archimedean copulas

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**Abstract:** In this paper we provide a methodology for estimating multivariate distributions defined through hierarchical Archimedean copulas. In general the true structure of the hierarchy is unknown. We develop a computationally efficient technique for grouping the data. For this purpose we introduce a hierarchical estimation procedure of the parameters and provide their asymptotic analysis. We consider both parametric and nonparametric estimation of the marginal distributions. The simulation study shows the effectiveness of the grouping procedure in the sense of structure selection. The methodology turns out to be very useful in order to model the distribution of asset returns in practical applications.

**Keywords**: hierarchical Archimedean copula; multivariate distribution; density estimation; asymptotic theory **JEL Classification**: C14.

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