

Asymptotically Distribution-Free Goodness-of-Fit
Testing for Tail Copulas
Assistenzprof. Dr. Sami Umut Can
(Universität von Amsterdam)

November 19, 2014

Let $(X_1, Y_1), \dots, (X_n, Y_n)$ be an i.i.d. sample from a bivariate distribution function that lies in the max-domain of attraction of an extreme value distribution. The asymptotic joint distribution of the standardized component-wise maxima $\max(X_i)$ and $\max(Y_i)$ is then characterized by the marginal extreme value indices and the tail copula R . The extreme value indices specify the asymptotic marginal distributions of the standardized maxima, and the tail copula specifies the dependence structure. We propose a procedure for constructing asymptotically distribution-free goodness-of-fit tests for the tail copula R . The procedure is based on a transformation of a suitable empirical process derived from a semi-parametric estimator of R . The transformed empirical process converges weakly to a standard Wiener process, paving the way for a multitude of asymptotically distribution-free goodness-of-fit tests. We also extend our results to the m -variate ($m > 2$) case. In a simulation study we show that the limit theorems provide good approximations for finite samples and that tests based on the transformed empirical process have high power.