WEIGHTED QUANTILE CORRELATION TESTS FOR GUMBEL, WEIBULL AND PARETO FAMILIES

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Abstract: Weighted quantile correlation tests are worked out for the Gumbel location and location-scale families. Our theoretical emphasis is on the determination of computable forms of the asymptotic distributions under the null hypotheses, which forms are based on the solution of an associated eigenvalue-eigenfunction problem. Suitable transformations then yield corresponding composite goodness-of-fit tests for the Weibull family with unknown shape and scale parameters and for the Pareto family with an unknown shape parameter. Simulations demonstrate slow convergence under the null hypotheses, and hence the inadequacy of the asymptotic critical points. Other rounds of extensive simulations illustrate the power of all three tests: Gumbel against the other extreme-value distributions, Weibull against gamma distributions, and Pareto against generalized Pareto distributions with logarithmic slow variation.

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