

# Copula Representation of Bivariate L-Moments: A New Estimation Method for Multiparameter 2-Dimensional Copula Models

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## Abstract

Recently, Serfling and Xiao (2007) extended the L-moment theory (Hosking, 1990) to the multivariate setting. In the present paper, we focus on the two-dimension random vectors to establish a link between the bivariate L-moments (BLM) and the underlying bivariate copula functions. This connection provides a new estimate of dependence parameters of bivariate statistical data. Consistency and asymptotic normality of the proposed estimator are established. Extensive simulation study is carried out to compare estimators based on the BLM, the maximum likelihood, the minimum distance and rank approximate Z-estimation. The obtained results show that, when the sample size increases, BLM-based estimation performs better as far as the bias and computation time are concerned. Moreover, the root mean squared error (RMSE) is quite reasonable and less sensitive in general to outliers than those of the above cited methods. Further, we expect that the BLM method is an easy-to-use tool for the estimation of multiparameter copula models.

**Keywords :** Copulas, Dependence, Multivariate L-moments, Parametric estimation, FGM copulas, Archimedean copulas.

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