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Forecasting Portfolio-Value-at-Risk with Nonparametric Lower Tail Dependence Estimates

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Abstract We propose to forecast the Value-at-Risk of bivariate portfolios using copulas which are calibrated on the basis of nonparametric sample estimates of the coefficient of lower tail dependence. We compare our proposed method to a conventional copula-GARCH model where the parameter of a Clayton copula is estimated via Canonical Maximum-Likelihood. The superiority of our proposed model is exemplified by analyzing a data sample of nine different bivariate and one nine-dimensional financial portfolio. A comparison of the out-of-sample forecasting accuracy of both models confirms that our model yields economically significantly better Value-at-Risk forecasts than the competing parametric calibration strategy.

Keywords: Copula, tail dependence, nonparametric estimation, Value-at-Risk, Canonical Maximum-Likelihood.

JEL Classification Numbers: C53, C58.

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