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Efficient estimation of a semiparametric dynamic copula model

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Abstract.

We propose a new semiparametric dynamic copula model where the marginals are specified as parametric GARCH-type processes, and the dependence parameter of the copula is allowed to change over time in a nonparametric way. A straightforward two-stage estimation method is given by local maximum likelihood for the dependence parameter, conditional on consistent first stage estimates of the marginals. First, we characterize the properties of the estimator in terms of bias and variance and discuss the bandwidth selection problem. We then propose an estimator that attains the semiparametric efficiency bound and demonstrate its superiority through simulations. Finally, we illustrate the wide applicability of the model in financial time series, comparing it also with traditional models based on conditional correlations.