HKMetrics-Seminar@Heidelberg

Research seminar in Econometrics and Statistics

Closed-Form Multi-Factor Copula Models with Observation-Driven Dynamic Factor Loadings

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Abstract:

We develop new multi-factor copula models with time-varying dependence structures via factor loadings with observation-driven dynamics. The new models are highly flexible, scalable to high dimensions, and ensure positivity of covariance and correlation matrices. The model retains a closed-form likelihood expression, thus allowing for straightforward parameter estimation and likelihood inference. We apply the new model to a large panel of 100 U.S. stocks over the period 2001-2014. The proposed multi-factor structure appears crucial for parsimoniously describing the dependence dynamics in high-dimensional stock return data, particularly when compared to the typically used single-factor models with dynamic loadings. The new factor models also improve on recently proposed benchmarks in terms of one-step-ahead copula density forecasts and global minimum variance portfolio performance.

(Joint work with Andre Lucas, Istvan Barra and Dick van Dijk.)