

Bayesian Estimation of Multiple Change Points in Factor Copula Models

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1 Abstract

This paper proposes methods to find multiple change points in the loadings of a factor copula model leading to changes in the correlation structure. A copula approach enables the modeling of marginal distributions separately from their dependence structure. We then propose a bayesian procedure, to simulate posterior draws of the factor loadings as well as the change points in the factor structure for a given amount of changes. The posterior for the changes and the loadings are simulated using the full conditionals in a random walk Metropolis-within-Gibbs sampler where the conditional posteriors for the loadings only depend on the likelihood of the according section and its prior. The conditional posterior for each change point only depends on the likelihood between the adjacent change points and its prior. The models with different number of changes are then compared using the posterior odds ratio. To access the marginal likelihoods Chib's method is used. A Monte-Carlo simulation considering different change scenarios as well as an empirical application considering changes in the correlation structure of EURO STOXX 50 companies in different sectors is presented.