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Titel: Efficient Iterative Maximum Likelihood Estimation of High-Parameterized Time Series Models

Abstract:

We propose an iterative procedure to efficiently estimate models with complex log-likelihood functions and the number of parameters relative to the observations being potentially high. Given consistent but inefficient estimates of sub-vectors of the parameter vector, the procedure yields computationally tractable, consistent and asymptotically efficient estimates of all parameters. We show the asymptotic normality and derive the estimator's asymptotic covariance in dependence of the number of iteration steps. To mitigate the curse of dimensionality in high-parameterized models, we combine the procedure with a penalization approach yielding sparsity and reducing model complexity. Small sample properties of the estimator are illustrated for two time series models in a simulation study. In an empirical application, we use the proposed method to estimate the connectedness between companies by extending the approach by Diebold and Yilmaz (2014) to a high-dimensional non-Gaussian setting.