Abstract

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Estimation of High-dimensional Vector Auto-regressive Processes

We will present a systematic theory for high-dimensional linear models with dependent errors and/or dependent covariates. To study properties of estimates of the regression parameters, we adopt the framework of functional dependence measures. For the covariates two schemes are addressed: the random design and the deterministic design. For the former we apply the constrained L1 minimization approach, while for the latter the Lasso estimation procedure is used. We provide a detailed characterization on how the error rates of the estimates depend on the moment conditions that characterize the tail behaviors, the dependencies of the underlying processes that generate the errors and covariates, the dimension and the sample size. Our theory substantially extends earlier ones by allowing dependent and/or heavy-tailed errors and the covariates.