Block covariance matrix estimation with structured off-diagonal blocks

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Abstract

This talk deals with the estimation of a block covariance matrix with off-diagonal blocks corresponds to the part of autoregression of order one structure, AR(1). Commonly used maximum likelihood estimation is challenging and time-consuming, thus we propose also another approach based on the least squares method. Some estimates are not always well-conditioned and may not even be definite. Thus, the improvement based on a shrinkage method and an additional algebraic approach is applied. The considered structure can be also expressed as a sum of two matrices: block diagonal matrix and AR(1) matrix. New approach based on estimation of whole AR(1) structure is presented and several estimation method are proposed. All considered estimates are compared with respect to some statistical properties and time needed to determine them.

Keywords

Block covariance matrix, Autoregression of order one structure, Maximum likelihood estimation, Least squares method, Shrinkage method.