

A shrinkage test for large-dimensional covariance matrix

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September 2021

Abstract

In this thesis, we use an optimal linear shrinkage estimator for the covariance matrix along with modern results on linear spectral statistics to establish a new test for sphericity under the large-dimensional asymptotics, namely when both the number of variables p and the sample size n tend to infinity such that $p/n \rightarrow c > 0$. Using similar techniques, we also show that a previously established test based on the Cauchy-Schwarz inequality remains usable under weaker assumptions than originally stated. We perform a Monte Carlo simulation study to verify our results, to assess the quality of our new test, and to see how well it performs compared to other tests.

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