Clt for largest eigenvalues in high-dimensional nonstationary time series and its applications

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Abstract: This paper considers a p-dimensional non-stationary time series model. We investigate the asymptotic behavior of the first k largest eigenvalues of the sample covariance matrices of the time series model. Then we propose an estimator of autoregressive coefficient and use it to test the near unit root. The convergence rate of the estimator is better than existed methods.

Simulations are also conducted to demonstrate the performances of the estimator and the statistic.