

On Generalized Expectation Based Estimation of a Population Spectral Distribution from High-Dimensional Data

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Abstract

This paper discusses the problem of estimating the population spectral distribution from high-dimensional data. We present a general estimation procedure that covers situations where the moments of this distribution fail to identify the model parameters. The main idea is to use generalized functional expectations as a substitute for the moments. Beyond the consistency, we also prove a central limit theorem for the proposed estimator. An application to the analysis of the eigenvalues of the sample correlation matrix of S&P 500 daily stock returns is proposed.

Keywords: Large sample covariance matrix; Population spectral distribution; Empirical spectral distribution; Generalized expectation estimation.