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Krishnan K Nair. *Estimating the Number Of Factors And Lags in High Dimensional Dynamic
Factor Models.* Preliminary report.

In this paper, we derive identification results for the number of factors and lags in high dimensional dynamic factor models using eigenvalue methods. The new approach does not require using the complex valued spectral covariance matrix and can be easily performed using a generalization of the traditional scree plot methodology. We employ Random Matrix Theory and the properties of the Stieltjes transform to characterize the eigenvalue distribution of symmetric time-delayed covariance matrices which will be used to derive a consistent moment-based estimation procedure for the number of factors and lags in the data. Additionally, we employ perturbation theory to assess the robustness of the identification results and show the importance of the separation of eigenvalues. The proposed consistent estimation procedures are shown to have excellent finite sample performance and outperform competing estimators in a series of Monte Carlo simulations. We also apply the methods to data reduction in macroeconomic time series and risk analysis in a large portfolio of stocks. (Received February 21, 2010)