A Structure Theory for Generalized Linear Dynamic Factor Models

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Abstract:

The analysis of high dimensional time series is important, e.g. for macroeconomics and finance. The idea is to extract information in the time- and the cross-sectional dimension; the latter is possible if the single time series show similar features. We consider so-called generalized dynamic factor models (GDFM's) in a stationary context, where the observations are the sum of two uncorrelated component processes: The so-called latent process (obtained from a linear trans-formation of a low dimensional factor process), which has a singular rational spectral density and the noise process which is allowed to show weak dependence in the cross-section (thus generalizing the classical assumption of cross-sectionally uncorrelated noise). In the talk a structure theory consisting of the following components will be presented: Factorization of rational singular spectra, the genericity of zeroless "tall" transfer functions and their properties in factorization and realization by state space systems, the "averaging out" of the noise component for the cross- sectional dimension tending to infinity.