

**UNIVERSITE LIBRE DE BRUXELLES
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INSTITUT DE RECHERCHE EN STATISTIQUE (ECARES)**

SEMINAIRE

EVOLUTIONARY FACTOR MODELS

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ABSTRACT

Traditional factor models are stationary in the time dimension. This appears restrictive since over long time periods it is unlikely that e.g. factor loadings remain constant. Some extensions to introduce dynamics have been proposed: Bai (2003) allows for serial correlation of the error terms, and Forni et al. (2000) suggest a dynamic factor model based on classical stationary time series models.

In this talk we introduce a new class of factor models with time-varying factor loadings. The basic idea is to consider these as smooth functions of time, rendering the process nonstationary while the factors are stationary. The assumption that loadings are smooth enables to estimate the model using nonparametric methods. One of the techniques employed is the rescaling of time to the unit interval, as proposed by Dahlhaus (1996), which generates an increasing number of observations in a small neighborhood of the point where the loadings are estimated. We discuss identification and estimation of the model and derive the asymptotic theory for the estimated loadings, the factors and the common components.