

Factor Analysis in Time Series



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Lecture 1 (Tuesday 12/01): Factor Analysis and Principal Components

- 1.1 Motivation: Common Factors and Dimension Reduction (Chamberlain and Rothschild 1983)
- 1.2 Factor Analysis (Spearman 1904, Anderson 2003)
 - Identification, Estimation and Relation to Principal Component Analysis
- 1.3 Principal Components (Pearson 1901, Hotelling 1933, Muirhead 1982, Anderson 1963, 2003)
 - Population Principal Components and Sample Principal Components

Lecture 2 (Thursday 12/03): Approximate Factor Models for Multivariate Time Series

- 2.1 Static Factor Models
 - Principal Components Regression and Least Squares (Brillinger 1981)
 - Inferential Theory for Factor Models of Large Dimensions (Bai 2003)
- 2.2 Principal Components in the Frequency Domain (Brillinger 1981)
- 2.3 Dynamic Factor Models
 - Identification and Estimation (Forni et al. 2000)
 - The Representation Theorem (Forni and Lippi 2001)

Seminar (Monday 12/07): Evolutionary Factor Analysis

- Evolutionary Static Factor Models (Motta 2009, Motta et al. 2006)
- Evolutionary Dynamic Factor Models (Motta 2009, Eichler et al. 2008)

Lecture 3 (Thursday 12/10): Determining the Number of Factors as a Model Selection Problem

- 3.1 Static Model: Estimating the Factor Space and Penalizing for Overfitting (Bai and Ng 2002)
- 3.2 Restricted Dynamic Model: Static versus Dynamic Factors and VAR representation (Bai and Ng 2007)
- 3.3 General Dynamic Model: Penalizing Eigenvalues in Frequency Domain and Stability Intervals (Hallin and Liška 2007)

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Lecture 4 (Tuesday 12/15): Prediction, Complements and Conclusions

- 4.1 Estimating Diffusion Indexes by Principal Components (Stock and Watson 2002a,b)
- 4.2 One-Sided Forecasting by Generalized Eigenvectors (Forni et al. 2005)
- 4.3 Complements and Conclusions

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