

Advanced Econometrics

2024-2025

SYSTEMS THEORY : AN ECONOMETRIC PERSPECTIVE

The aim of this course is to review the models and approaches of systems theory in an econometric perspective, that is with special attention to identification issues, online statistical inference, reduced rank systems, filtering of latent variables, exogeneity and causality analyses.

The systems will be introduced in a progressive way first deterministic static, second stochastic static, before considering stochastic dynamics systems. In these presentations the system can be multivariate, nonlinear and admit several hidden layers (i.e. hidden state equations). They will include in particular linear systems, multilayer perceptron neural network, models with stochastic parameters, nonlinear Markov processes, Compound Autoregressive models, or different versions of dynamic panel models with systemic factor, or contagion. Special focus will be on qualitative or count observations and on big data frameworks.