Research Seminar Series in Economic Sciences, 2024 - 2025

Speaker: Valentin Patilea*, CREST Ensai, France*

Title: "Adaptive Functional Time Series Analysis"
Date & Time: Wednesday, October 30th, 2024, 14:00 - 15:30
Place: Grypario Megaro (Sofokleous 1) | 4th floor | Lecture Hall "Kosmas Psychopedis" (416)
Live streaming of the event: https://delos.uoa.gr/opendelos/search-live
Url: https://www.econ.uoa.gr/ereynitika_seminaria_research_seminars/

Abstract:
Functional Data Analysis (FDA) refers to the case where the observation units are the whole curves (also called trajectories or sample paths). The data set then consists of a collection of trajectories, modeled by a same stochastic process defined over some domain. Dependent functional data arise in fields such as environment, energy, biology or finance. They are often collected sequentially at (ir)regular domain points and exhibit a serial dependence. Functional time series (FTS) analysis aims to understand the serial dependence between curves and their dynamics over time.
FTS analysis, and more generally FDA, depend critically on the regularity of the observed curves or surfaces. Estimating this regularity is a difficult problem in nonparametric statistics. In FDA, however, it is much easier due to the replication nature of the data. After introducing the concept of local regularity for functional data, we provide user-friendly nonparametric methods for investigating it, for which we derive non-asymptotic concentration results. The results are obtained under weak dependence conditions between the curves. Usual FTS models (functional autoregressive, functional ARCH, etc) satisfy our conditions. As an application of the local regularity estimation, we propose adaptive estimators for the mean and autocovariance functions, and construct adaptive predictions for FTS. Extensive simulation experiments illustrate the performance of our estimators.
The talk is based on joint work with M. Vimond and H. Maissoro.

Organizers: Dimitris Kenourgios, *Professor*
      George Dotsis, *Assoc. Professor*
      Frago Kourandi, *Assist. Professor*

Thank you.