Advanced Time Series Econometrics: Overview of Course

Scottish Graduate Programme in Economics

Overview

- This is a course in advanced time series econometrics with a focus on models used in macroeconomics and finance
- Lectures given by Niko Hauzenberger, and Ping Wu
- niko.hauzenberger@strath.ac.uk, and ping.wu@strath.ac.uk
- https://nhauzenb.github.io/, and https://pingwu.org/
- We have put course materials on a website:
- https://nhauzenb.github.io/SGPE-ECNM11049/

Motivation for the Course

- Your previous study of time series covered many important econometric models of great use in practice
- E.g. regression with time series variables and VARs
- Recently two issues have emerged which call for extensions of these or completely new econometric tools:
- Parameter change
- Big Data: lots of new variables we want to include in our models
- This course discusses econometric methods which can be used to deal with these issues

Coverage of Course

- Four main sets of models:
- 1. State space models
- Useful for a wide variety of applications in macroeconomics and finance:
- trend-cycle decompositions
- time-variation in parameters
- ARMA modelling
- Dynamic stochastic general equilibrium (DSGE) models.

Coverage of Course

- 2. Non-linear time series models
- Markov switching or threshold autoregressive models are used to model time-variation or regime change in parameters.
- Empirically important: Lots of evidence of parameter change in means (VAR coefficients) and variances (changing volatility).
- 3. Factor methods are used to deal with Big Data.
- Information in large data sets into a small number of factors, allowing for parsimonious econometric analysis.
- 4. Mixed frequency models
- GDP is available at quarterly frequency, unemployment monthly, stock prices daily (or even more frequent)
- How to combine lots of variables with different frequencies together in an econometric model?

Style of Course

- Applied econometrics rather than theoretical econometrics
- For each model class, lectures will cover:
- Definitions and explanation of how and why model is used in practice
- Properties of model
- How to estimate in practice using R
- Empirical illustration
- Not many proofs or theoretical derivations

Organization of Course

- 14 hours of lectures
- 4 hours of computer tutorials
- For each, instruction sheet and data set available on course website
- Assessment is by final exam
- Last year's exam is available on the course website (https://nhauzenb.github.io/SGPE-ECNM11049/) and will be discussed in the revision lecture

Computer Sessions

- Computer tutorials begin next week
- Moke Wu is the tutor for this course
- You must bring a laptop to the computer tutorials
- Please read the Lab0 file (Introduction to R) provided on the course website and load R onto your laptop before the tutorial begins

Readings

- Primary textbook: Ghysels, E. and Marcellino, M. (2018) Applied Economic Forecasting Using Time Series Methods
- Another good text book which covers most of the course material is:
- Tsay, R. (2010). Analysis of Financial Time Series (third edition)