FAH3456 Simulation Methods in Econometrics 7.5 credits

Simuleringsmetoder i ekonometri

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FAH3456 valid from Spring 2020

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

AH2304 Advanced transport modelling or AH2307 Urban Modeling and Decision Support

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing the course the student should be able to

- formulate an appropriate and flexible discrete choice econometrics designed for a given problem at hand

- estimate a standard discrete choice econometric model using standard econometric software

- formulate an appropriate discrete choice econometric model, choose an appropriate estimator and estimate such a model, using high level programming language and mathematical software libraries

- understand the trade-offs between statistical and computational efficiency and take informed decisions of choosing an appropriate estimator for a given problem

- choose a reduced form or structural econometric model for a given research question

- choose and apply basic bootstrap techniques

Course contents

The development of simulation-based estimators, along with the evolution of computational power, now allows the researcher to flexible formulate the a structural model based on micro-economic theory and estimate the structural model without relying on reduced form econometric models. The aim of this course is to introduce simulation methods to estimate such flexile discrete choice econometric models.

In this course we will focus on econometrics with limited dependent variables. This include, but is not limited to, discrete choice econometrics. As such, we will cover econometric methods that are a crucial part of the scientific toolbox in transportation research, but also in many other fields such as psychology, environmental economics and labour economics.

Theory for random utility economics, maximum likelihood estimation, logit, probit, censored probit, spatial probit, simulated method of moments, simulated maximum likelihood, method of simulated scores, and introduction to Bayesian methods, Metropolis-Hastings and Gibbs sampling, dynamic discrete choice models including dynamic programming models

Examination

- INL1 - Hand in assignment, 4.5 credits, grading scale: P, F
- PRO1 - Project, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.