**Advanced Econometrics 1**
**University of Helsinki / Helsinki GSE, Fall 2020**
**Info for incoming students**

- Advanced Econometrics 1 covers the basic methods used in linear regression analysis of economic variables. The classical finite sample theory, asymptotic analysis of the linear regression model, as well as the necessary methodological tools required for these topics are covered. Primary learning objective is the theory of econometrics.
- The main textbook on the course is: Hayashi (2000), *Econometrics*, Princeton University Press. It is necessary for you to have access to a copy during the course. We will cover the following parts of this book:
  - Chapter 1 except not Section 1.5
  - Chapter 2 except not Sections 2.8, 2.9, 2.12, and Appendix 2.A
  - Chapter 3, Sections 3.1–3.5 and 3.8 but only those parts that concern IV/2SLS estimation (and nothing on GMM)
- Additional material and lecture slides will be distributed during the course.
- How to prepare for the course?
  - It may be helpful to obtain a copy of Hayashi's book and glance at the material to be covered.
  - The students are assumed to be familiar with the practical application of the linear regression model in econometrics or statistics. Suitable background material can be found for instance in the undergraduate textbooks by Stock & Watson (Introduction to Econometrics) or Wooldridge (Introductory Econometrics). You should be familiar with basic estimation and inference in the multiple regression model.
  - The course will make heavy use of matrices. You should be familiar with basic concepts such as addition and multiplication of matrices, transposes, inverses, and linear independence of vectors.
  - We assume knowledge of basic concepts in probability and statistics. You should be comfortable with concepts such as density functions of random variables, joint density functions of random vectors, expected value of a random variable, the conditional expected value, the normal distribution, hypothesis testing, confidence intervals, and $p$-values.
  - Fluency in basic mathematics (standard calculus, summation notation, etc.) is also assumed.