ECO2400 Econometrics, Part I

Course Goal: This is the first half of ECO2400 for Fall 2024. This half begins with a discussion on identification in econometrics, followed by some basic statistical concepts that allow a discussion of popular estimation methods for parametric models and their theoretical properties.

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Office Hours: By appointment

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TA office hours: To be announced.

Reference: The discussion on identification will be mainly based on lecture notes. The remaining content can be referred to Statistics and Econometric Models (Gourieroux and Monfort [GM], 1995).

Course evaluation : This part of the course consists 2 problem sets (graded).

Course Contents :

1. Identification in Econometrics and examples. (lecture notes)
   a) What is identification?
   b) Point identification vs partial identification
   c) Examples
2. Introduction ([GM] Ch. 1-2)
   a) Statistical model, estimator, comparison of estimators
   b) Statistical Decision Theory (with an example on treatment assignment)
3. Sufficient statistics and its application in Econometrics ([GM] Ch 3.1 and some other added material)
4. Statistical information ([GM] Ch. 3)
5. Estimation for regular models([GM] Ch. 5, 7, 8)
   a) Best Unbiased estimator
   b) Best Linear Unbiased estimator
   c) Extreme estimator
6. Estimation for irregular models (lecture notes)

7. Simultaneous equation system [[GM] Ch 9]
    a) Instrumental Variable methods
    b) Weak IV problem and robust inference
    c) Two Sample IV method.
8. Optional [if time permits]
    a) Quantile regression, Mixture Models
    b) Optimization: Linear Programming, Convex Programming, Constrained optimization
    c) Shrinkage estimator: Ridge, Stein's estimator, LASSO, Pre-testing, Empirical Bayes