Econometrics I  
G31.2100 (Part 2)  
Fall 2007

Model-Based Estimation

Instructor:

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Time:

Tuesday: 12:30-2:00, Room 517  
Thursday: 12:30-2:00, Room 5-75, 44 W. 4th Street (KMEC)  
Friday 12:30-2:30, Room 517

Office Hours:

4:00-5:30 Wednesday (to set-up an appointment, contact me after class or via e-mail).

Course Objectives:

I am calling this section of the 1st Year Econometrics Sequence “Model-Based Estimation.” The goal of this series of lectures is to try to explore the connections between economics and metrics that give us the name of the field. Too often purely statistical results are emphasized in the teaching of econometrics. While it is necessary to have a good grounding in statistics and probability theory to do econometrics, these foundations are really only necessary conditions. Econometrics is a balanced mixture of economic theory, statistical theory, and, last but not least, data. An economic model of a phenomenon is required for us to interpret, in an economically-valid manner, the relationships we observe in the data. An estimator of these parameters can only be proposed and evaluated in the context of the data available for the estimation exercise and the parameterization of the model. In practice, most high-quality applied econometrics exercises that appear in journals are the result of repeated adjustment of the model to the data, the estimator to the model and the data, etc.

The goal of this short series of lectures (and accompanying homework exercises) is to give you some sense of this process. For example, when adapting an otherwise deterministic model to data, how should randomness be introduced (randomness is required for estimators to have sampling distributions, etc.)? Should we simply append an additively separable disturbance term to a deterministic behavioral rule or equilibrium relationship,
and proceed from there? Should we introduce population heterogeneity into some of the primitive parameters of the model? What are the economic/statistical strengths and weaknesses of the various approaches? We will be considering these issues in the abstract and within the context of a set of diverse papers that I consider good examples of the model-based approach to empirical analysis. All of the papers have a non-trivial theoretical component, a clear identification analysis, and estimates of primitive parameters that can be used to conduct policy experiments or explain otherwise anomalous empirical findings, or test statistics designed to measure the ability of a proposed model to fit a set of sample statistics.

We will distribute weekly problem sets, most or all of which will include computational exercises. For the most part these exercises will involve the use of real data sets, and students will be expected to program in GAUSS, a matrix programming language, or MATLAB or Fortran, if they prefer. Instruction in the use of GAUSS/MATLAB will be provided in some of the early lab sessions.

Course Information:

I will be posting course information, including the syllabus, assignments, and data sets, on my home page (location given above).
Lecture Schedule:

1. **Model-Based Estimation**


2. **Point-Process Models (Nonlinear Estimation, Mixtures)**


3. **Search Models (I) (Identification Analysis, Superefficient Estimators)**


4. **Search Models (2) (Measurement Error, Limited Dependent Variables, Policy Evaluation)**


5. **Search Models (3) (Method of Simulated Moments, Bootstrapping)**


6. **Individual (Household) Choice (Limited Dependent Variables, Maximum Likelihood)**

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7. **Multiagent Choice in a Strategic Setting (Limited Dependent Variables, Multistage Estimation, Policy Evaluation)**


8. **“Standard” Consumer Demand Theory (Linear Systems Estimation, Hypothesis Testing)**


9. **Demand Analysis with Nonconvex Choice Sets (Mixed Continuous/Discrete Choice)**


10. **Demand Analysis in a Macroeconomic Context (Maximum Likelihood with Time Series Data)**


11. **Contractual Models (Structural Estimation in a Linear Regression Framework, Fixed Effects)**

12. Dynamic Contracting Models (Unobserved Heterogeneity, Dynamic Selection, Measurement Error)


14. Review and/or Excess Capacity