Economics 508: Econometrics II
Course Outline

Hiroki Tsurumi
Fall Term 2003

Textbooks

1. Tsurumi, H. *Econometrics II Lecture Notes* available at the Alphagraphics, Church Street New Brunswick


Reference Books

Statistics


**Topics to be Covered**

1. *Multivariate statistical analysis and its application*

   Multivariate distribution theory, noncentral $\chi^2$ and $F$ distributions, quadratic forms in normal variates, Durbin-Watson statistics, simple and partial correlations, canonical correlation, principal components, factor analysis, and discriminant analysis

2. *Simultaneous equations systems: estimation*

3. *Mathematics of finance*

   Brownian motion, stochastic integration, option pricing

4. *Financial Econometrics, covered in an extra session per week*

   Each of you choose a chapter from Campbell, Lo and MacKinlay, (Chapters 2, 4, 5, 6, 7, 8, 9, 10, 11, 12) and report on it in class. Also, you must prepare a list of updated references on the topic using search engines. Out of the reference list choose one paper to report in class.
5. *Time Series*
   - My Lecture Notes
   - Davidson Part III, IV, V, VI

6. *Stable Distribution*

7. *Constancy of Regression Parameters*

*Course Evaluation*

- Term paper (research paper) (50%)
- Midterm examination (20%)
- Final examination (30%)
Lecture Notes: Table of Contents

**Multivariate Statistical analysis**
- Multivariate Normal and Related Distributions 1
- Simple, Partial, and Canonical Correlations 20
- Principal Component Analysis 40
- Factor Analysis 51
- Classification Analysis 81

**Censored Model: Two Selection Rules** 98

**Survival Analysis**
- Failure Rates, Pure Death Process, Censoring 123
- Proportional Hazard (PH), Accelerated Failure Time (AFT) 139
- Competing Risks 149

**Simultaneous Equations**
- A Simple Example 161
- Limited Information Approach

**Mathematics of Finance**
- Brownian motion, stochastic integration 183
- Option pricing 221

**Time Series**
- AR(1) 230
  - White, Anderson, Fuller
  - Tests of AR(1)
  - Durbin-Watson Test 253
  - Computation of a Quadratic Form in Normal 264
  - Augmented Dickey-Fuller Test 282
  - Johansen’s Co-integration Test 289
  - Ratio Tests of a Unit Root 301
  - Bayesian Tests of Nonstationarity 328

**Stable Distribution** 329

**Constancy of Regression Parameters** 374