Econ 370: Econometric Theory
Fall 2005

Time: M 4:45-7:15PM
Classroom: CL 209

Instructor: Mototsugu Shintani
Office: CL 211 W 4:00-5:00PM or by appointment
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Course Objectives: This course covers advanced topics in the estimation and inference in econometric models and is designed for students with basic knowledge of econometrics at the first year Ph.D. level. The central part of the course is a theoretical developments and applications of the generalized method of moments (GMM) and its related estimators. The emphasis on GMM estimators is based on the fact that most econometric procedures, such as OLS, IV, system method and nonlinear method, can be treated as a special case of GMM estimators. All students are required to submit term papers with a choice of a simulation or empirical applications.

Prerequisites: The equivalent of Econ 307, 309 or above is required. Students should be familiar with basic concepts of econometrics including probability theory, linear algebra, OLS, GLS and maximum likelihood. Students who wish to submit an empirical paper need some knowledge of a statistical software or a programming language. (Participants will be introduced to GAUSS during the course.)

Required Textbook: Fumio Hayashi, *Econometrics* (2000, Princeton University Press)

Recommended Textbook:
Mittelhammer, R.C., G.G. Judge and D.J. Miller, *Econometric Foundations* (2000, Cambridge University Press)

Hall, Alastair R., *Generalized Method of Moments* (2005, Oxford University Press)

Method of Grading:

Attendance and participation	10 points
Assignments	40 points
Class presentation	10 points
Term paper	40 points

Course Schedule
(Econ 370 M 4:45-7:15)

Week 1 [No class]
Week 2 [Aug29, M] Limit theorems, OLS, IV, 2SLS, GMM
- Hayashi, chap 2-3

Week 3 [Sep5, M] More on limit theorems
- Hayashi, chap 2-3

Week 4 [Sep12, M] efficient GMM, J test, multiple equation GMM, dynamic panel
(Problem set 1 due – Sep 12)
- Hayashi, chap 4-5
- Arellano, M. and S. Bond (1991) "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations," *Review of Economic Studies* 58, 277-297.

Week 5 [Sep19, M] nonlinear GMM, extremum estimator
(Problem set 2 due – Sep 19)
- Hayashi, chap 7
- Newey, W.K. and D. McFadden (1994) "Large sample estimation and hypothesis testing," in: R.F. Engle and D.L. McFadden, eds., *Handbook of Econometrics*, Vol. 4 (North-Holland, Amsterdam) 2111-2245. [GMM trinity tests]

Week 6 [Sep26, M] GMM trinity test, HAC
(Computer project 1 due – Sep 26)
- Hayashi, chap 6
- Andrews, D.W.K. (1991) "Heteroskedasticity and autocorrelation consistent covariance matrix estimation," *Econometrica* 59, 817-858.

Week 7 [Oct3, M] more on HAC
(Problem set 3 due – Oct 3)

Week 8 [Oct10, M] bootstrap
(Problem set 4 due – Oct 10)
- Hansen, B.E. and K.D. West (2002) "GMM and macroeconomics," *Journal of Business and Economic Statistics* 20, 460-469.

Week 9 [Oct17, M] empirical likelihood, weak IV
(Computer project 2 due – Oct 17)
- Stock, J.H., J.H. Wright, and M. Yogo (2002) "A survey of weak instruments and weak identification in Generalized Method of Moments," *Journal of Business and Economic Statistics* 20, 518-529.

Week 10[No class] **October Break**
Week 11[Oct31, M] paper presentation 1
Week 12[Nov7, M] paper presentation 2
Week 13[Nov14, M] paper presentation 3
Week 14[No class] **Thanksgiving Break (Nov19-Nov27)**
Week 15[Nov28, M] paper presentation 4
Week 16[Dec5, M] paper presentation 5
Week 17**[Dec13, T]** **Term paper due**