

PEF
Advanced Time Series Econometrics
SPRING 2005

Instructors: Patrick Gagliardini and Fabio Trojani

Material:

- Selected research articles

Basic References:

1. Andrews, D.W.K, (1993), Tests for parameter instability and structural change with unknown change point, *Econometrica*, 61, 821-856.
2. Andrews, D. W. K. (1994), Empirical process methods in econometrics, *Handbook of Econometrics*, Vol. 4, Chapter 37.
3. Brockwell, J. P. and R. A. Davis (1991), *Time series: theory and methods*, Springer-Verlag, New York.
4. Davidson, J. (1994), *Stochastic limit theory*, Oxford University Press.
5. Davidson, J., (2005), Asymptotic methods and Functional Central Limit theorems. *Handbook of Econometrics* (in preparation).
6. Gouriéroux, G. and A. Monfort (1995), *Statistics and econometric models*, Vol 1 and 2, Cambridge University Press.
7. Hansen, L. P. (1982), Large sample properties of Generalized Method of Moments Estimators, *Econometrica*, 50, 1029-1054.
8. Newey, W. and D. Mc Fadden (1994), Large sample estimation and hypothesis testing, *Handbook of Econometrics*, Vol. 4, Chapter 36.
9. Stock, J. H. and J. H. Wright (2000), GMM with weak instruments, *Econometrica*, 68, 1055-1096.
10. Pollard, D. (1984), *Convergence of stochastic processes*. New York, Springer Verlag.
11. Van der Vaart, A. and J. A. Wellner (1996), *Weak convergence and empirical processes*. New York, Springer.
12. White, H. (1984), *Asymptotic theory for econometricians*, Academic Press.
13. Wooldridge, J. M. (1994), Estimation and inference for dependent processes, *Handbook of Econometrics*, Vol. 4, Chapter 45.

Course description: The course is an introduction to some of the most used theoretical results and broadly applied methods in the econometric analysis of time series models. The goal is to introduce fundamental results and techniques which highlight the main methodological issues arising in the econometric analysis of time series models. We address these issues in a unified Generalized Method of Moments setting.

Grading: There will be a final oral exam and group homeworks. They will count each for 50% of the final grade:

Homeworks	50%
Final Exam	50%.

Contents:

1. Basic asymptotic theory for time series in an asymptotically stationary GMM setting
 - (a) Basic features of GMM estimators in a time series context
 - (b) Uniform law of large numbers for dependent data and consistency of GMM estimators

- (c) Central limit theorem for dependent data and asymptotic normality of GMM estimators and related statistics
 - (d) GMM asymptotic parametric tests and GMM tests for model misspecification
 - (e) Estimation of asymptotic covariance matrices: asymptotic properties of Newey-West-type estimators
2. Asymptotic theory for time series applied to more general statistical functionals in an asymptotically stationary GMM setting
- (a) Weak convergence and related concepts
 - (b) Functional central limit theorem and continuous mapping theorem
 - (c) Testing for endogenous structural breaks: definition of the tests
 - (d) Asymptotic properties of GMM tests for structural breaks: asymptotic distribution under the null and asymptotic local power properties
3. Asymptotic theory for time series in GMM setting under weak instruments
- (a) Weak instruments: definition and basic properties
 - (b) Weak convergence for empirical processes
 - (c) Asymptotic properties of GMM statistics in a weak instruments context