PEF
Financial Econometrics
Spring 2005

Instructors: Patrick Gagliardini and Fabio Trojani
Material:

- Selected research articles

Basic References:

[1] Aït-Sahalia, Y. and A. Lo, (1998). Nonparametric Estimation of State Price Densities Implicit in Financial Asset Prices, Journal of Finance, 53, 499-547.

[2] Bosq, D., (1998). Nonparametric Statistics for Stochastic Processes (Springer, New-York).

[3] Gagliardini, P., C. Gourieroux and E. Renault, (2005). Efficient Derivative Pricing by Extended Method of Moments, working paper.

[4] Gallant, A.R. and Nychka, D.W., (1987). Semi-Nonparametric Maximum Likelihood Estimation, Econometrica, 55, 363-390.

[5] Gouriéroux, C. and A. Monfort, (1997). Simulation-Based Econometric Methods. (Oxford Univerity Press, New York).

[6] Gouriéroux, C., A. Monfort and E. Renault, (1993). Indirect Inference, Journal of Applied Econometrics, 8, 85-118.

[7] Ortelli, C. and F. Trojani, (2005), Robust Efficient Method of Moments, Journal of Econometrics, forthcoming.

[8] White, H., 1994. Estimation, Inference and Specification Analysis. (Cambridge University Press, New York).

Course description: The course is an introduction to some general econometric methods that are broadly used in the empirical analysis of financial models. The focus is on simulation-based inference procedures and nonparametric methods. These powerful techniques are necessary in the econometric analysis of general financial models with, for instance, unknown likelihood functions, unobservable risk factors or nonparametric functional dependencies. Applications of these methods to important problems in financial ecomometrics such as stochastic volatility models, risk neutral density estimation and nonlinear dependence modelling will be discussed. Finally, recent developments leading to the Extended Method of Moments and the Robust Efficient Method of Moments will be addressed.

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. Simulation based methods
   (a) Pseudo Maximum Likelihood theory
   (b) Indirect inference and Efficient Method of Moments: theoretical properties and asymptotic distribution
   (c) Seminonparametric (SNP) auxiliary models
   (d) Application: econometric analysis of stochastic volatility models
   (e) Robust Statistics: some basic principles

(f) Robust Efficient Method of Moments

2. Nonparametric methods

   (a) Nonparametric density estimation and nonparametric estimation of conditional moments
   (b) Asymptotic properties of nonparametric estimators
   (c) Applications to risk neutral density estimation
   (d) Extended Method of Moments
   (e) Applications to derivatives pricing