ECONOMETRICS
Manuel Arellano
CEMFI, 2022-2023

Lectures: Mon 9:30-11:00, Wed 9:30-11:00.
Exercises: Wed 11:30-13:00 conducted by **Victor Sancibrián** victor.sancibrian@cemfi.edu.es

Grades will be based on homework (20%), presentations (10%), and final exam (70%)

Course outline

Part I: Regression

1. Least squares

1.1 Asymptotic properties of linear predictors
1.2 Weighted least squares
1.3 Cluster-robust standard errors
1.4 Panel regression with fixed effects

2. Quantile methods

2.1 Medians, quantiles and optimal predictors
2.2 Quantile regression
2.3 Asymptotic results
2.4 Counterfactual decompositions

Part II: Likelihood methods

3. Maximum likelihood and large sample testing

3.1 Likelihood models
3.2 Examples: Binary regression and duration models
3.3 Consistency and asymptotic normality
3.4 Estimation subject to constraints

4. Bootstrap methods

4.1 Nonparametric bootstrap
4.2 Asymptotic properties
4.3 Confidence intervals
4.4 Dependent samples

5. Bayesian inference

5.1 Bayesian analysis
5.2 Specifying prior distributions
5.3 Large-sample Bayesian inference
5.4 Markov chain Monte Carlo methods

Part III: Time series

6. Stochastic processes

6.1 Stationarity and ergodicity
6.2 Autoregressive and moving average models
6.3 Asymptotics with dependent observations
6.4 Nonstationary processes
6.5 Panel autoregression with fixed effects

Part IV: Beyond exogeneity

7. Instrumental variables

7.1 Measurement error
7.2 Two-stage least squares
7.3 Testing overidentifying restrictions
7.4 Panel regression under sequential exogeneity

8. Treatment effects

8.1 Potential outcomes
8.2 Matching methods
8.3 Self-selected treatment
8.4 Local average treatment effects

Textbooks

Bruce Hansen, *Econometrics*, Princeton University Press, 2022.
J. Angrist and J.-S. Pischke, *Mostly Harmless Econometrics*, Princeton University Press, 2009.
M. Arellano, *Panel Data Econometrics*, Oxford University Press, 2003.
C. Cameron and P. Trivedi, *Microeconometrics*, Cambridge University Press, 2005
C. Gourieroux and A. Monfort, *Statistics and Econometric Models*, Cambridge U.P., 1995.
J. D. Hamilton, *Time Series Analysis*, Princeton University Press, 1994.
F. Hayashi, *Econometrics*, Princeton University Press, 2000.
R. Koenker, *Quantile Regression*, Cambridge University Press 2005.
J. Stock and M. Watson, *Introduction to Econometrics*, Pearson Education, 2nd edition, 2007.
J. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, MIT Press, 2010.