


Master in Business Administration and Quantitative Methods

Course 2007/2008 - Spring Term

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Description: The main objective of this course is to provide a review of the standard econometric tools useful for the empirical analysis of economic and financial data. Also, the course will provide with the basic tools to know how to analyze the statistical properties of the methods considered. The focus is on cross-sectional data that usually have the property of being independent. The analysis of dynamic data is carried out in other two courses of the program. This course will show how the general principles should be applied in a wide variety of contexts and fundamentally to learn which are the main limitations of the available techniques. Additionally, we will get some background on statistical computing and computational intensive methods.

Grading: It consists of a final exam, two problem sets that will require theoretical and computational work and a five-page project. Grades for this course will be based on the final exam (70%) and the project (30%). The problem sets are a necessary condition in order to get a final grade. The paper can be either an empirical application, a simulation study on the sample properties of an estimator of the parameters of the regression model or a survey of the literature of a given topic.

Syllabus:

UNIT 1. Introduction: The regression model.

1.1 Conditional expectation.

1.2 Assumptions.

1.3 Interpretation of the model.

UNIT 2. Estimation principles.

2.1 Ordinary Least Squares.

2.2 Maximum Likelihood.

2.3 Method of Moments.

UNIT 3. Hypothesis testing principles.

3.1 Wald test.

3.2 Lagrange Multiplier.

3.3 Likelihood Ratio Test.

3.4 Comparison between LR, Wald and LM tests.

UNIT 4. Heteroscedasticity in the regression model.

4.1 Ordinary Least Squares. Robust covariance matrix.

4.2 Generalized Least Squares.

4.3 Inefficiency of OLS.

4.4 Testing for heteroscedasticity.

UNIT 5. Endogeneity of regressors.

5.1 Errors in variable.

5.2 Simultaneous equation bias.

5.3 Instrumental variables.

5.4 Testing for endogeneity.

Basic Bibliography:

- Creel, M. (2006) Econometrics, (Available at <http://pareto.uab.es/mcreel/Econometrics/econometrics.pdf>).
- Greene, W.H. (2000) Econometrics Analysis, Prentice-Hall. (Library code: D 330.43 GRE).
- Hayashi, F. (2000) Econometrics, Princeton University Press. (Library code: D 330.43 HAY).
- Wooldridge, J.M. (2000) Introductory Econometrics: A Modern Approach, South Western College Publishing (Library code: D 330.43 WOO).

Additional readings:

UNIT 1:

- Zellner, A. (1983) Statistic Theory and Econometrics, Handbook of Econometrics, vol. 1, chapter 2. (Library code: D 330.43 HAN (V.1)).
- Lau, L.J. (1986) Functional Forms in Econometric Model Building, Handbook of Econometrics, vol. 3, chapter 26. (Library code: D 330.43 HAN (V.3)).
- Horowitz, J.L. (2001) The Bootstrap, Handbook of Econometrics, vol. 5, chapter 52. (Library code: D 330.43 HAN (V.5)).

UNIT 2:

- Theil, H. (1983) Linear Algebra and Matrix Methods in Econometrics, Handbook of Econometrics, vol. 1, chapter 1. (Library code: D 330.43 HAN (V.1)).
- Newey, W.K. and D. McFadden (1994) Large Sample Estimation and Hypothesis Testing, Handbook of Econometrics, vol. 4, chapter 36. (Library code: D 330.43 HAN (V.4)).
- Rothenberg, T.J. (1984) Approximating the Distribution of Econometric Estimators and Test Statistics, Handbook of Econometrics, vol. 2, chapter 15. (Library code: D 330.43 HAN (V.2)).
- Shao, J. and Tu, D. (1995) The Jackknife and the Bootstrap, Sections 7.1 and 7.2. (Library code: D 519.234 SHA).

UNIT 3:

- Berndt, E.R. and N.E. Savin (1977) Conflict among criteria for testing hypothesis in the multivariate linear regression model, *Econometrica*, 45, 1263-1278.
- Breusch, T.S. (1979) Conflict among criteria for testing hypothesis: extensions and comments, *Econometrica*, 47, 203-207.
- Engle, R.F. (1984) Wald, Likelihood Ratio and Lagrange Multiplier Tests in Econometrics, Handbook of Econometrics, vol. 2, chapter 13. (Library code: D 330.43 HAN (V.2)).
- Evans, G.B.A. and N.E. Savin (1982) Conflict among the criteria revisited; the W, LR and LM tests, *Econometrica*, 50, 737-748.
- Gregory, A.W. and Veall, M.R. (1985) Formulating Wald tests of nonlinear restrictions, *Econometrica*, 6, 1465-1468.
- Shao, J. and Tu, D. (1995) The Jackknife and the Bootstrap, Section 7.3. (Library code: D 519.234 SHA).

UNIT 4:

- Ali, M. and C. Giaccotto (1984) A study of several new and existing tests for heteroscedasticity in the general linear model, *Journal of Econometrics*, 26, 355-374.
- White, H. (1980) A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct test for Heteroskedasticity, *Econometrica*, 48, 817-838.

Liu, R.Y. (1988) Bootstrap procedures under some non-i.i.d. models, *Annals of Statistics*, 16, 1696-1708.

UNIT 5:

◦ Hamilton, J.D. (1994) Time Series Analysis, Chapter 9. (Library code: D 519.246.8 HAM).

◦ Hausman, J.A. (1983) Specification and Estimation of Simultaneous Equation Models, Handbook of Econometrics, vol. 1, chapter 7. (Library code: D 330.43 HAN (V.1)).

Software: I recommend to students who want to carry out research in Econometrics or Applied Finance/Economics to use **MATLAB** (or **Octave**, its freeware version) or **S-Plus** (or **R**, its freeware version). The rest can use E-views or any other statistical package.

- Causin, M.C. (2005) MATLAB Tutorials.
- LeSage, J.P. (1999) Applied Econometrics using MATLAB.
(Available at <http://www.spatial-econometrics.com/html/mbook.pdf>).