Economics 679: Advanced Econometrics II – Fall 2009
Department of Economics, University of Michigan

1 Introduction

This course constitutes the first class in the two-course block that forms the second-year field sequence in Econometric Theory. This class will cover two main topics: time series econometrics and nonparametric econometrics. Statistical finite sample and large sample theory will also be covered along the semester, whenever required by the material being presented. The results presented in this semester will be very useful when discussing models and topics of particular importance in econometrics, which will be done in the follow up class Econ-678 in Winter 2010. Basic references for each portion of the class are provided below.

Each student will be required to act as scribe for at least one week (two lectures). The resulting lecture notes, as well as any other material relevant for this class, will be available in the course website. In addition, students will be required to solve (approximately) bi-weekly problem sets and two take-home exams. The grading scheme and other details of the class are provided below.

2 Useful Information

Instructor:	Matias D. Cattaneo (`cattaneo@umich.edu`)
Website:	`http://www.umich.edu/~cattaneo`
Office Hours:	Mon 4:00p-5:30p, 307 Lorch
Lectures:	Mon-Wed 2:30p-4:00p, Mon 3451 Mason, Wed G232 Angell
Class Website:	`http://ctools.umich.edu`

3 Grading

Lecture Scribe Notes:	10%
Bi-weekly Problem Sets:	10%
Take-home Mid-Term Exam:	40%
Take-home Final Exam:	40%

4 General Background References

[1] Amemiya, T. (1985): Advanced Econometrics, Harvard.

[2] Lehmann, E.L. and G. Casella (1998): Theory of Point Estimation, Springer-Verlag.

[3] Lehmann, E.L. and J.P. Romano (2008): Testing Statistical Hypothesis, Springer-Verlag.

[4] Pagan, A. and A. Ullah (1999): Nonparametric Econometrics, Cambridge.

[5] Serfling, R.J. (1980): Approximation Theorems of Mathematical Statistics, Wiley.

[6] van der Vaart, A.W. (1998): Asymptotic Statistics, Cambridge.

[7] White, H. (2001): Asymptotic Theory for Econometricians, Academic Press.

[8] Wooldridge, J.M. (2001): Econometric Analysis of Cross Section and Panel Data, Cambridge.

5 Main Topics References

PART I – Time Series: univariate stationary time series, univariate nonstationary time series, multivariate time series and other topics (if time permits). Some references:

[1] Anderson, T.W. (1971): The Statistical Analysis of Time Series, Wiley.

[2] Billingsley, P. (1999): Convergence of Probability Measures, Wiley.

[3] Brockwell, P.J. and R.A. Davis (1991): Time Series: Theory and Methods, Springer.

[4] Davidson, J. (1994): Stochastic Limit Theory, Oxford University Press.

[5] Fuller, W.A. (1996): Introduction to Statistical Time Series, Wiley.

[6] Hamilton, J.D. (1994): Time Series Analysis, Princeton University Press.

[7] Harvey, A.C. (1993): Time Series Models, MIT Press.

[8] Stock, J.H. (1994): *Unit Roots, Structural Breaks and Trends*, in Handbook of Econometrics, Volume 4, ed. by R.F. Engle, and D.L. McFadden, North Holland.

[9] Tanaka, K. (1996): Time Series Analysis, Wiley.

[10] van der Vaart, A.W. (2002): *Times Series*, unpublished lecture notes.

[11] Watson, M.W. (1994): *Vector Autoregressions and Cointegration*, in Handbook of Econometrics, Volume 4, ed. by R.F. Engle, and D.L. McFadden, North Holland.

[12] Wooldridge, J.M. (1994): *Estimation and Inference for Dependent Processes*, in Handbook of Econometrics, Volume 4, ed. by R.F. Engle, and D.L. McFadden, North Holland.

PART II – Nonparametrics: kernel estimation, local polynomial, series/sieves, partitioning/nearest neighbor, penalized splines. Some references:

[1] Eilers, P.H.C. and B.D. Marx (1996): "Flexible Smoothing with B-splines and Penalties (with discussion)," *Statistical Science* 11(2): 89–121.

[2] Fan, J. and I. Gijbels (1996): Local Polynomial Modeling and Its Applications, Chapman & Hall.

[3] Huang, J.Z. (1998): "Projection Estimation in Multiple Regression with Application to Functional Anova Models," *Annals of Statistics* 26(1): 242–272.

[4] Ichimura, H. and P. E. Todd (2007): *Implementing Nonparametric and Semi-parametric Estimators*, in Handbook of Econometrics, Volume 6B, ed. by J. J. Heckman, and E. E. Leamer, North Holland.

[5] Kohler, M., A. Krzyzak and H. Walk (2006): "Rates of convergence for partitioning and nearest neighbor regression estimates with unbounded data," *Journal of Multivariate Analysis* 97: 311–323.

[6] Masry, E. (1996): "Multivariate Local Polynomial Regression for Time Series: Uniform Strong Consistency and Rates," *Journal of Time Series Analysis* 17(6): 571–599.

[7] Newey, W.K. (1997): "Convergence Rates and Asymptotic Normality for Series Estimators," *Journal of Econometrics* 79: 147–168.

[8] Tsybakov, A.B. (2008): Introduction to Nonparametric Estimation, Springer.

[9] Wand, M.P. and M.C. Jones (1995): Kernel Smoothing, Chapman & Hall.