

Economics 851

Introduction:

Economics 851 is the second course of a two-course sequence in econometrics intended for Ph.D. students. It is assumed that students have taken ECON 850.

The lectures will be based largely on:

- R. Davidson and J. G. MacKinnon, *Econometric Theory and Methods*, Oxford University Press, 2004, henceforth **ETM**.

Copies of this book are available from the Queen's bookstore and from numerous on-line vendors. Corrections may be obtained from the World Wide Web. The book's home page is <http://www.econ.queensu.ca/ETM/>.

Some use will also be made of

- R. Davidson and J. G. MacKinnon, *Estimation and Inference in Econometrics*, New York, Oxford University Press, 1993, henceforth **EIE**.

It is not necessary to purchase EIE, although it would certainly be useful to have access to a copy. Handouts with key material from EIE and other sources will be provided, if necessary.

Students should bring ETM to class with them so that the lecturer can refer to equations and figures.

Topics:

The following list of topics is somewhat tentative. It is possible that not all topics will be covered.

0. *Instrumental Variables*. Some of the material in Chapter 8 of ETM that should have been covered in ECON 850 will be dealt with.
1. *The Generalized Method of Moments*. Chapter 9 of ETM, plus some additional material, which is available as the file **GMM-supplement-851.pdf** in the "assignments" directory of the class website. Some use may be made of parts of Chapter 17 of EIE.
2. *Maximum Likelihood*. Chapter 10 of ETM.
3. *Discrete and Limited Dependent Variables*. Chapter 11 of ETM.
4. *Multivariate Models*. Chapter 12 of ETM.
5. *Stationary Time Series Methods*. Chapter 13 of ETM.
6. *Unit Roots and Cointegration*. Chapter 14 of ETM.
7. *Specification Testing*. Sections 15.1 through 15.4 of ETM.
8. *Nonparametric Methods*. Section 15.5 of ETM, plus additional material if time permits.

Computers:

All students are assumed to have access to and be familiar with a computer capable of running TSP, Stata, GRETL, R, Shazam, or some other suitable program. This could be a personal computer, or it could be one of the department computers: **qed**, **arrow**, **frisch**, **lovell**, **durbin**, **sargan**, **waugh**, **cox**, etc. The full name of **qed** is **qed.econ.queensu.ca**, and so on. All students should have accounts on **qed**, on **arrow**, and on all the machines in Dunning 211. Note that the machines in 211 share the same home directories. The instructor is most familiar with TSP, but students who are not familiar with it are advised to learn a more modern program, such as GRETL, R, or Stata.

Copies of TSP may be acquired by seeing Mark Babcock. Linux users can simply download what they need from **qed**. All that is needed is the executable `/usr/local/bin/tsp`. Since R and GRETL are free software, they can easily be acquired.

The personal computers in Dunning 350 all have TSP and Stata installed on them, but most publicly accessible PCs elsewhere on campus do not. Therefore, some students may find it difficult to use the PC versions of these programs. These students should use **qed** or one of the other Linux machines. Documents that explain how to use **qed** and the other Unix machines in the department are available from Mark Babcock.

Data for the problem sets and class notes may be obtained via the World-Wide Web. The main page for the course is at

<http://www.econ.queensu.ca/faculty/mackinnon/econ851/>

Marking:

There will be five assignments, which collectively will account for 25% of the final mark. These assignments will make extensive use of the computer. There will also be a final examination, which will account for 75%.

Additional References:

T. Amemiya, *Advanced Econometrics*, Cambridge, MA, Harvard, 1985.

Cameron, A. C. and P. K. Trivedi, *Microeconometrics*, New York, Cambridge, 2005.

R. Davidson and J. G. MacKinnon, "Artificial regressions," in *Companion to Theoretical Econometrics*, ed. B. Baltagi, Oxford, Blackwell, 2001, 16–37.

W. H. Greene, *Econometric Analysis*, Fifth Edition, New York, Prentice-Hall, 2003.

J. D. Hamilton, *Time Series Analysis*, Princeton University Press, 1994.

F. Hayashi, *Econometrics*, Princeton University Press, 2000.

- Q. Li and J. S. Racine, *Nonparametric Econometrics: Theory and Practice*, Princeton University Press, 2007.
- J. G. MacKinnon, “Bootstrap inference in econometrics,” *Canadian Journal of Economics*, **35**, 2002, 615–645.
- J. G. MacKinnon, “Bootstrap methods in econometrics,” *Economic Record*, 2006, **82**, S2–S18.
- Newey, W. K. and D. L. McFadden, “Large sample estimation and hypothesis testing,” Chapter 36 in *Handbook of Econometrics*, Volume IV, R. F. Engle and D. L. McFadden, eds., Elsevier, 1994.
- P. A. Ruud, *An Introduction to Classical Econometric Theory*, New York, Oxford University Press, 2000.
- J. M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, Cambridge, Mass., MIT Press, 2002.

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