Economics 7828 - Econometrics
Spring 2010

Robert McNown
Office: Economics 109
Telephone: 492-8295

Office Hours: T 9-11
R 2:00-4:00
Email: mcnownr@colorado.edu

Economics 7828 is a course in intermediate econometrics for PhD students. Building upon the statistical foundations presented in 7818, this course covers both theoretical and applied aspects of econometrics.

Economics 7818 is the prerequisite for this course, which requires a solid background in mathematical statistics and matrix algebra. Our text also covers the essentials of probability and statistics, matrix algebra, and linear statistical models in appendices A through D.

You will be actively working with computers in this course. Computer exercises and instruction will use the EViews econometrics package that is available on our PC network. Instruction on EViews will be provided through a series of econometrics exercises, designed to illustrate the use of an econometric software package and to develop skills in the application of econometric tests and procedures to economic data. Instructions and data sets for these exercises will be accessible from the CULearn site for our class. Complete instructions on the use of EViews are available from the help menu of the EViews program. If you prefer to use a different econometric software package, such as Stata or R, this is fine, but you will have to learn the alternative software on your own.

Homework problems will be assigned regularly, and completion of these is essential to learning econometrics and, incidentally, doing well on the exams and the project. You are encouraged to form teams of two for working homework problems, computer exercises, and the applied econometrics project described below. Each team needs to submit only one copy of any assignment.

Your grade in the course will be based on a midterm exam and a final exam, each counting towards 30% of your grade, and homework (including computer exercises) and an applied regression project, each for 20% of your grade.

Applied Econometrics Projects

The project involves the application of econometric analysis to the estimation and testing of a model and dataset of your team's choice. Your written paper will resemble empirical papers in social science or business research, but with more detail on the econometric analysis than you might find in published articles. Ideas for topics may be found in The Review of Economics and Statistics, Applied Economics, and other applied economics journals. You may also get some ideas from other economics courses, and from examples presented in the text, the EViews exercises, or in lectures.

Although the topic choice is fairly open-ended, I want to make sure that every team finds an appropriate topic and does so long before the end-of-term rush. You are therefore required to submit a brief written proposal identifying the topic you will investigate, sketching a tentative model for estimation, describing hypotheses to be tested and questions to be addressed, and identifying the data sources and some

background literature relevant to your project. This can be done in two or three pages. This proposal is due on Thursday, February 18. You are invited to discuss your ideas with me at any time during the development of your project. One purpose of this proposal is to have you identify your data sources early in the term so that you will not be caught later in the semester with a project that is not feasible for lack of data.

Once we have agreed on a project you should collect the necessary data and proceed with the estimation. In estimating your model there may be several variants you will try (alternative functional forms, differing variable definitions, alternative lag structures, alternative estimation techniques etc.). You will also certainly encounter various econometric problems. An important part of your assignment is to test for the presence of econometric problems (autocorrelation, heteroscedasticity, multicollinearity, etc.) and to deal with these problems using procedures you will learn in the course. The evaluation of your project will reflect, in part, your skill in handling these econometric problems, and your use and interpretation of variants of your basic model.

When you have completed your estimation, you should prepare your final report following the format of empirical articles in economics journals. Typically these papers include the following:

1. Introductory overview of the research question; statement of objectives.
2. Presentation of theory and review of relevant theoretical literature.
3. Discussion of previous empirical work in the area; critique and explanation of why your approach is vastly superior, or at least different.
4. Specification of your model(s) to be estimated; variable definitions and description of data sources.
5. Presentation of results: estimated equations and summary statistics; results of tests of econometric problems and description of corrective actions taken; results of statistical tests of hypotheses; comparison with other studies.
6. Discussion and conclusion; elaborate on the implications of your results for theory and policy; draw as much substantive content as possible from interpretations of your estimates and tests of hypothesis; present suggestions for further research (now that I have done all this work, this is how I would do it right).
7. Bibliography; list your data sources and any literature that you have cited in the paper. Keep in mind that any text or mathematical derivations that have been copied from other sources must by identified with quotation marks and given appropriate references. Quoted text should be kept to a minimum; most of the writing should be your own. When you have relied on other works for ideas (e.g., models, explanations, interpretations, etc.) these sources must be given credit also.

Your final paper is due on Friday, April 23. Include with your written paper the computer printouts of your most important results, with some guide to the output in your text. Late papers will be penalized by 10 percentage points if I receive it before I must post grades, and by 20 percentage points if it is any later.

Readings and Topics

Text:Greene, William H. *Econometric Analysis* Fifth Edition (2003) or Sixth Edition (2008) Prentice Hall.

I. Classical Linear Regression: least squares estimation, properties of estimators, and simple tests of hypotheses. [5th edition: Chapters 1-4; Chapter 5 (sections 5.1 & 5.2). 6th edition: Chapters 1-4]

II. Tests of general linear restrictions, dummy variables, and functional forms. [5th edition: Chapter 6 (sections 6.1-6.4), chapter 7 (sections 7.1-7.4). 6th edition: chapter 5 (sections 5.1 – 5.4), chapter 6.]

III. Specification error. [5th edition: Chapter 8 (sections 8.1-8.2) 6th edition: chapter 7 (sections 7.1 – 7.2)].

IV. Generalized Linear Model & Heteroscedasticity. [5th edition: Chapters 10 and 11 (sections 11.1 – 11.7)]. 6th edition: Chapter 8]

Midterm Examination - **March 9**

V. Serial correlation. [5th edition: Chapter 12 (sections 12.1 – 12.9. 6th edition: Chapter 19 (sections 19.1 – 19.9)

VI. Panel data methods. [5th edition: Chapter 13 (sections 13.1 – 13.4. 6th edition: chapter 9 (sections 9.1 – 9.5).

VII. Systems of equations: seemingly unrelated regressions and simultaneous equations models. [5th edition: Chapters 14 (sections 14.1 – 14.3) &15. 6th edition: Chapters 10, 12 (sections 12.1 – 12.4) & 13.

Final Examination - May 5 (Wednesday 1:30-4:00)

Important Dates:

February 18 - Proposals Due
March 9 - Midterm Exam
April 23 - Projects Due
May 5 (Wednesday 1:30-4:00) Final Exam

Syllabus Addendum

(1) If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services before the fourth week of classes so that your needs be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and www.Colorado.EDU/disabilityservices
(2) Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, you must inform the instructor of religious obligations two weeks in advance of a conflict.

(3) Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate
changes to my records. See policies at http://www.colorado.edu/policies/classbehavior.html and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

(4) The University of Colorado at Boulder policy on Discrimination and Harassment, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships apply to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH, the above referenced policies and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://www.colorado.edu/odh

(5) All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic
sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at
http://www.colorado.edu/academics/honorcode/