Economics 8828 - Spring 2008

Evaluation and Administration

There will be one midterm examination and a take-home final exam, each counting towards 25% of your course grade. There will also be some computer exercises and problem sets counting another 10% of the final grade. The remaining 40% of your grade will be based on your individual project (30%) and a class presentation of an article on econometric methodology (10%), both described below.

Please see the addendum to this syllabus for policies concerning observance of religious holidays, classroom conduct, accommodation of disabilities, honor code, and discrimination and harassment. Please contact me promptly if you have any problems that we need to discuss.

Individual Projects

You will each be responsible for an individual term project on an econometrics topic of interest to you. Your choice of topic should be related to the general areas mentioned above (simultaneous equations problems or time series methods). Ideally your project should have both a theoretical or analytical component and an application, and the project should encompass a topic in econometrics that goes beyond what we cover in class. To make this assignment more concrete, an example of an appropriate project could involve allowing for structural breaks in tests of nonstationarity (unit roots). Although we will cover unit root testing in some depth, we will probably not cover this particular extension. There is a theoretical literature in which these tests are developed, and the analytical component of the project would present the statistical foundations behind these tests. Then the tests could be applied to one or more time series of interest as the applied component. In some cases the applied component could be a Monte Carlo or bootstrap simulation that demonstrates the performance of a particular econometric test or procedure in a particular context. Ideas for these projects are suggested by the various readings below, and I will mention other possible topics in class.

To assure that your project is appropriate, you should prepare a proposal describing (1) the econometric procedure you will investigate, (2) some key references to the relevant econometric theory, (3) the data set (empirical or simulated) and model to which you plan to apply the procedure, and (4) the data sources. One or two pages should suffice for this proposal, and it should be submitted to me by **February 18.** You are encouraged to discuss your project idea with me before submitting a proposal, or at any time while you are working on the project. Your final project is due on **Monday, April 21**. Late submissions are penalized by 10% of the score if received by April 30, or by 20% is submitted after April 30.

Computer Projects and Problem Sets

To get practical experience with some of the econometric methods discussed in the course, you will complete several computer projects using EViews, which is available on

output and answers to exercises requiring some interpretation of the output. Instructions for the use of Eviews, the exercises, and the data sets will be posted on our WebCT site that you can access at http://webct.colorado.edu.

I will also design several problem sets that require you to extend the mathematical presentation from class into new areas. Collaboration on the computer exercises and problem sets is acceptable, as long as you inform me about this in advance.

Article Presentation

In keeping with the seminar format, each student will be responsible for a presentation to the class of an article on econometric methodology. I have listed below a number of articles that would be appropriate for student presentations. Each of these is related to the major topics of the course, and presentations will be scheduled to fit with the course sequence. I am open to suggestions for other articles for presentation, as long as these fit within the major themes of the course. During the first two weeks of the class, you are urged to look over the titles below, examine any articles that sound interesting to you, and begin to sign up with me to reserve a presentation topic. I have copies of these papers that I can loan out for your examination if you cannot access these from the internet. I will match presenters with articles during the first week of February, and give you a schedule of presentations. Two presentations will also be scheduled for our final exam period (Tuesday, May 6, 4:30-7:00 p.m.) The tentative order of the presentations is given in the topical outline below.

You are encouraged to read a few related papers and/or the related pages in Maddala and Kim, to help put the article in a broader context. It should be possible to combine the topic for presentation with your individual project for some obvious complementarities. Your presentation will be based on the clarity of presentation, the use of visual aids, your ability to respond to questions from the class, and how well you motivate the topic in terms of its relation to this course, its connection to a larger literature, or practical lessons for future research. If some articles are too long to present in one class period, we can discuss strategies for limiting the scope of the presentation.

Prior to the presentation all students are

1.Baxter, Marianne, and Robert King, “Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series,” Review of Economics and Statistics 81 (Nov. 1999) 575-593. *This paper presents procedure for extracting components of different frequencies (e.g., seasonal, cyclical, and trend) from a time series. Although the presentation is based on spectral analysis, the application procedure is very straightforward and is available in EViews.*

2.Campbell, John and Pierre Perron, "Pitfalls and Opportunities: What Macroeconomists Should Know About Unit Roots," NBER Macroeconomics Annual 1991. Cambridge: MIT Press (1991). *A survey of the implications of nonstationarity for traditional econometric practice, with critical comments by Cochrane and Miron.* [This paper is difficult to find in the library, but you are welcome to borrow it from me.]

3.Engle, Rob, D. Lilien, and R. Robins, "Estimating Time-Varying Risk Premia in the Term Structure: The ARCH-M Model. Econometrica 55 (1987) 391-407. *Extends the ARCH model to allow the conditional variance to enter the regression equation.* And

Engle, Rob, “GARCH 101: The Use of the ARCH?GARCH Models in Applied Econometrics,” *Journal of Economic Perspectives* 15 (Fall 2001) 101-116. *This paper presents a simple illustration of the use of the ARCH model.*

4.Freedman, David A., and Stephen C. Peters, "Bootstrapping a Regression Equation: Some Empirical Results," Journal of the American Statistical Association, vol. 79 (March 1984), 97-106. *A very accessible presentation and application of the bootstrap procedure in a multiple equation regression model. Chapter 10 of Maddala and Kim provides an updated survey of bootstrapping in time series models.*

5.Granger, C.W.J., “Some Recent Developments in a Concept of Causality,” Journal of Econometrics 39 (1988) 199-211. *Granger discusses several issues in interpretation of tests of Granger-causality. An appropriate companion piece is the short paper by Dufour and Tessier (1993) “On the Relationship between Inpulse Response Analysis, Innovation Analysis, and Granger Causality,”* Economics Letters 42 (1993) 327-333.

6.Granger, C.W.J. and P. Newbold, "Spurious Regressions in Econometrics," Journal of Econometrics

8.Hausman, J. A., "Specification Tests in Econometrics," Econometrica 46 (November 1978) 1251-1271. *A single principle is applied to a variety of tests for model misspecification, including applications to simultaneous equations models.*

9.Hylleberg, S., R.F. Engle, C.W.J. Granger, and B. S. Yoo, "Seasonal Integration and Cointegration," Journal of Econometrics

16.Schwert, G.W., "Tests for Unit Roots: A Monte Carlo Investigation," Journal of Business and Economic Statistics 7 (1989) 147-59. *One of the first Monte Carlo*

The Bootstrap: Freedman and Peters (1984); Maddala and Kim, chapter 10

Markov Switching Models: Engel and Hamilton (1990); Maddala and Kim, Chapter 15.

Computer exercise 5. Advanced Time Series Modeling (due April 7)

II. Simultaneous Equations Models

A. Identification

Greene, Sections 16.1-16.3

B. Estimation and specification tests.

Greene, Sections 16.4-16.7

Student Presentations: (May 6, 4:30 – 7:00 – final exam period)

Mroz (1987)

DeJong, D.N., and C. H. Whiteman, "Reconsidering Trends and Random Walks in Macroeconomic Time Series," Journal of Monetary Economics, 28 (1991) 221-254. A pair of articles that presents a forceful critique of unit root testing and the conclusion that most macroeconomic time series are I(1).

Dickey, David, William Bell and R. Miller, "Unit Roots in Time Series Models: Tests and Implications," American Statistician 40 (1986) 12-26. A readable presentation, with empirical examples, of the Dickey-Fuller tests for unit roots.

Doldado, Juan, Tim Jenkinson, and Simon Sosvilla-Rivero, "Cointegration and Unit Roots," Journal of Economic Surveys 4 (1990) 249-73. A survey of this literature up to 1990.

Enders, Walter, Applied Econometric Time Series second edition. New York: Wiley (2004). A practical text on various time series topics including ARIMA modeling, unit root tests, ARCH models, vector autoregressions, and cointegration.

Engle, Rob, and C.W.J. Granger, "Cointegration and Error-Correction: Representation, Estimation and Testing," Econometrica 55 (March 1987) 251-76. The original presentation of the concept of cointegration and its connection to error correction models.

Engle, Rob, and C.W.J. Granger, (eds.) Long-Run Economic Relationships: Readings in

Nelson, Charles, and Charles Plosser, "Trends and Random Walks in Macroeconomic Time Series: Some Evidence and Implications," J. of Monetary Economics 10 (1982) 130-62. An early application of unit root tests to economic time series. They find most of the series studied to be integrated, a result contested by later researchers using different methods. Their data set is available for further investigations.

Nelson, Charles R., and Heejoon Kang, "Pitfalls in the Use of Time as an Explanatory Variable in Regression," Journal of Business and Economic Statistics 2 (1984) 73-82. *The traditional practice in regression analysis with trended variables is to control for deterministic trends. This article shows what happens under such treatment if the variables actually have stochastic trends.*

Ng, S. and P. Perron, "Lag length selection and the construction of unit root tests with good size and power," Econometrica 69 (2001) 1519-1554. They have combined insights from several alternative approaches to unit root testing to develop test procedures that are currently recognized as the state of the art in unit root testing. These test procedures are also appropriate, with suitable modifications, as residual based tests for cointegration. Their procedures are programmed into recent versions of EViews.

Oxford Bulletin of Economics and Statistics volume 48 no. 3 (1986) is a special issue containing early papers on cointegration and error correction models.

Oxford Bulletin of Economics and Statistics Volume 54, No. 3 (August 1992) is another special issue on Testing Integration and Cointegration.

Oxford Bulletin of Economics and Statistics Volume 61, No. 4 (Supplement 1999) is a special issue on panel unit root and cointegration. The article my Maddala and Wu is a particularly useful review of the various unit root tests that have been proposed.

Perron, Pierre, "Testing for a Unit Root in a Time Series with a Changing Mean," Journal of Business and Economic Statistics 8 (1990) 153-62.

Perron, Pierre, "The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis," Econometrica 60 (January 1992) 119-43. The first of this pair or articles presents the test of a unit root against the stationary alternative with change in mean or change in trend slope. The second applies the test to the Nelson-Plosser data.

Phillips, Peter, and Mico Loretan, " Estimating Long Run Economic Equilibria," Review of Economic Studies 58 (1991) 407-36. They review several procedures for estimating cointegrating equations, including a quite straightforward, single-equation procedure that is efficient and yields asymptotically valid test statistics.

Sims, Christopher, "Macroeconomics and Reality," Econometrica 48 (January 1980) 1-49. *The classic presentation of Sims' VAR methodology and critique of traditional structural econometric methods.*

Stock, James, and Mark Watson, "Vector Autoregressions," Journal of Economic Perspectives 15 (Fall 2001) 101-116. *This is a very readable introduction to VARs and some of the issues of controversy over their use in policy analysis.*

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/