

E574

APPLIED ECONOMETRICS AND FORECASTING

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OFFICE HOURS: MW 1:00-2:30, W 4:30-5:00 and by appointment

TEXTS

During the semester, we will use a variety of sources and much of the material we consider will appear in more than one place. The following book will provide the core of the material that we will study during most of the semester. They should be available in the bookstore.

Francis X. Diebold: *Elements of Forecasting* (4th edition)

Walter Enders *Applied Econometric Time Series* (2nd edition)

Other texts that we will use this semester are listed below. Most, if not all of these will be available through the reserve desk at the library. If you cannot locate a book, please get in touch with me and I will loan you my copy on a short-term basis.

Michael P. Clements and David F. Hendry: *A Companion to Economic Forecasting*
(An edited volume containing papers describing many different aspects of economic forecasting. A worthwhile purchase if you plan to pursue forecasting for a career.)

C. W. J. Granger and Paul Newbold: *Forecasting Economic Time Series* 2nd edition
(A nice review of many time series techniques; not too advanced)

M. Hashem Pesaran and Mike Wickens: *Handbook of Applied Econometrics: Macroeconomics* (A group of articles dealing with various techniques employed by macro-econometricians.)

Russell Davidson and James G. MacKinnon: *Estimation and Inference in Econometrics* (A comprehensive handbook, graduate level.)

James D. Hamilton: *Time Series Analysis* (An encyclopedia of time series techniques; more advanced than Davidson and MacKinnon.)

Andrew Harvey: *The Econometric Analysis of Time Series*, 2nd edition (A nice companion to Diebold's book; it covers many of the same topics in more detail)

Spyros Makridakis, Steven C. Wheelwright, and Rob J. Hyndman: *Forecasting: Methods and Applications*, 3rd edition (An undergraduate textbook; simple & straightforward)

William H. Greene, *Econometric Analysis*, 4th edition (A comprehensive yet readable guide to econometrics)

Course Structure:

This course will acquaint you with a variety of econometric topics in the areas of forecasting and time series analysis. Some of the topics covered this semester are forecast construction and evaluation, time series analysis, model development, estimation techniques for multi-equation models, and simulation.

The primary goal of the course is to give you hands-on experience with these different techniques so that you are familiar with them and able to apply them in your professional career. Thus there will be a number of homeworks throughout the semester. Your performance on these homeworks constitutes 70% of your final grade. While I expect that you will cooperate on the homework, it is important that, in the end, you do your own work. If you simply copy your answers from someone else, you will lose credit for the homework. The last page of this syllabus contains the IUPUI policies on academic dishonesty.

A research paper is also required for the class. The paper must utilize the time series techniques that we study during the semester. It may either be in the area of applied econometrics or forecasting. The paper constitutes 30% of your final grade.

There are no exams in E574. However, depending on my impression of your progress during the semester, there may be an in-class quiz the last day of class. If this quiz is given, it will be open book and worth one homework.

SOFTWARE

We will use a program called Time Series Processor (TSP) which is a powerful software package for analyzing time series. You are free to use any other package that you'd like, but it must be able to produce the results required for the assignments. I will introduce you to the fundamentals of TSP the first evening. Throughout the semester I will demonstrate how to use the program for the specific tasks that we encounter. TSP is available for free on a CD from the staff in CA436.

TSP provides a graphing command and graphs may be produced through EXCEL (available as part of the Microsoft Office suite through the bookstore at a very low price). The computer lab in CA436 also has a program called Kaleidagraph.

Even if you don't use Excel for graphing, it is a worthwhile program to acquaint yourself with because of its popularity and data manipulation capabilities.

The TSP web-site is <http://www.tspintl.com/>

Once there, click on "SiteMap," then scroll down the list of links to

"TSP User's Guide online Edition" to learn how to build TSP programs.

"TSP Reference Manual online Edition" to learn how about specific TSP commands.

A brief, useful introduction to TSP can be found at the following site:

http://www.core.ucl.ac.be/econometrics/econ2135/Guide_TSP_econ2135.pdf

SOME WEB RESOURCES

For data on GDP and the various components of the National Income Accounts:

<http://www.bea.doc.gov/bea/dn/home/gdp.htm>

(Click on [Interactive NPIA Tables](#))

This site is sponsored by the Bureau of Economic Analysis within the US Department of Commerce.

For data on money, interest rates, prices , and exchange rates:

<http://research.stlouisfed.org/fred2/>

This site is sponsored by the Federal Reserve Bank of St. Louis.

For data on consumer prices and the unemployment rate:

<http://www.bls.gov/>

This site is sponsored by the Bureau of Labor Statistics within the US Department of Labor.

For information about the Business Cycles (especially the official date for recessions):

<http://www.NBER.org/> (go to the bottom of the page)

This site is sponsored by the National Bureau of Economic Research. This is a private research organization. There is a small group of economists sponsored by the NBER called the "Business Cycle Dating Committee" whose responsibility is to determine the months in which a recession begins and ends. Their dates are based on movements in a broad array of individual variables.

For information on economies around the world:

<http://www.worldbank.org/>

The World Bank is a global organization that collects funds from developed countries and channels these funds to less-developed countries in order to finance projects that will enhance the nation's productivity.

http://pwt.econ.upenn.edu/php_site/pwt_index.php

This site contains the Penn World Tables, an ongoing panel data set of macroeconomic data for economies around the world.

COURSE OUTLINE

WEEK 1: INTRODUCTION TO TSP, DIFFERENCE EQUATIONS

Enders, Ch. 1.

WEEKS 2-3: REVIEW OF REGRESSION

Harvey: Ch. 2; Diebold, Ch. 2, Ch. 11.1-11.2.

WEEK 4: MAXIMUM LIKELIHOOD

Davidson and MacKinnon, Ch. 8; Diebold, Ch.14 (scan);
Enders, Ch. 3 (scan)

WEEK 5: SERIAL CORRELATION

Davidson and MacKinnon, Ch. 10; Greene, Ch. 13

WEEK 6-7: FORECASTING

Diebold, Ch. 1, 3, 12

Diebold, "The Past, Present, and Future of Macroeconomic Forecasting," *The Journal of Economic Perspectives* **12** (Spring 1998) 175-192.

Clements and Hendry, "An Overview of Economic Forecasting," in *A Companion to Economic Forecasting*

WEEK 8: TREND AND SEASONALITY

Diebold, Ch. 5, 6; Enders, Ch 4.1

WEEKS 9-10: MODELING CYCLES

Enders, Ch. 2; Diebold, Ch. 7-9; Makridakis, et. al, Ch. 7&8;
Granger and Newbold, Ch. 1

WEEK 11: UNIT ROOTS

Enders, Ch. 4; Diebold, Ch. 13; Davidson and MacKinnon, Ch. 20

Walter S. Escudero, "A Primer on Unit Roots and Cointegration," available
at <http://www.depeco.econo.unlp.edu.ar/trabdoce/docen3.pdf>

WEEK 12-14: MULTI-EQUATION MODELS

Enders, Ch. 5; Diebold, Ch. 11

Craig S. Hakkio and Charles S. Morris: "Vector Autoregressions" A User's
Guide"

WEEK 15: COINTEGRATION

Enders, Ch. 6;

David A. Dickey, Dennis W. Jansen, and Daniel L Thornton, "A Primer on Cointegration with an Application to Money and Income," *Federal Reserve Bank of St. Louis Review*, 73 (March/April 1991) pp.58-78.

WEEK 16(?): PANEL DATA

Greene, Ch. 14

I adhere to the IUPUI policies on academic dishonesty below. If you violate these policies, you will receive a substantial reduction in your score on the relevant assignment.

Cheating: Cheating is dishonesty of any kind with respect to examinations, course assignments, alteration of records, or illegal possession of examinations. It is the responsibility of the student not only to abstain from cheating, but, in addition, to avoid the appearance of cheating and to guard against making it possible for others to cheat. Any student who helps another student to cheat is as guilty of cheating as the student assisted. The student should also do everything possible to induce respect for the examining process and for honesty in the performance of assigned tasks in or out of class.

Plagiarism: Plagiarism is the offering of the work of someone else as one's own. Honesty requires that any ideas or materials taken from another source for either written or oral use must be fully acknowledged. The language or ideas taken from another may range from isolated formulas, sentences, or paragraphs to entire articles copied from books, periodicals, speeches, or the writings of other students. The offering of materials assembled or collected by others in the form of projects or collections without acknowledgment is also considered plagiarism. Any student who fails to give credit for ideas or materials taken from another source is guilty of plagiarism.