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Econ 422
Economic Forecasting
Spring 2005

Most important rule for this class: read the syllabus! All the information you need is contained in the syllabus.

Time and Location: TBA.

Office Hours: TBA

Prerequisites: You need to have completed Econ 220 prior to taking this class. I will check the roster of each student enrolled in this class. If you have not taken Econ 220 (statistics) please let me know as soon as possible. Contrary to last year, this class does not satisfy the college writing requirements.

TA: I will let you know if we have a TA and will post additionally OH on LearnLink.

Textbook: F. Diebold, "*Elements of Forecasting*" 2nd or 3rd edition.

Material: This course provides and introduction to Forecasting in Economics. Before learning the theory and application of forecasting, we need to review the econometrics tools that we will use in the rest of the class. We will then review linear regression, estimation and testing. This part is not emphasized in the textbook so the recommended book for the first part of the class is Stock and Watson: *"Introduction to Econometrics"*. Additionally, Wooldridge :*Introductory Econometrics"* or Ramanathan, "*Introductory Econometrics*" are very good references. You may also use any other undergraduate econometrics book.

All the textbooks I mentioned are on reserve at the library and can be checked out for 2 hours. You can find the 3 chapters of Ramathan's book relevant to this class on E-Reserve. *"Using Econometrics. A Practical Guide:* by Studenmund is also a good first reading for someone who has never been exposed to Econometrics before and it is also available on reserve.

Since applications to real examples will be emphasized throughout this class, I strongly recommend that you read the Wall Street Journal or the New York Times on a daily basis. If you are interested in subscribing to the Wall Street Journal at a discounted price, I have applications to subscribe at a highly discounted price. We will be using a variety of data relating to environmental issues as greenhouse gas emission, global warming, energy trends, transportation (forecasting traffic congestion and predicting variables that affect the demand for alternative transportation), and alternative energy.

Grading: There will be two midterm exams, a final, a paper and, if we have time, an oral presentation of the results of your paper. Additional mandatory homework will be given during the semester. Homework and paper are due in class not later than 10 minutes after the start of the

class. Any material turned in after that time or given to me by email will be considered late. The assignments will count toward the grade as follows.

Midterm 1	15%
Midterm 2	15%
Final	35%
Assignments (4)	15%
Paper	20%

Attendance to the class is not required but it is strongly recommended as the exams are mostly based on the materials given during class. Bonus points will be awarded for pop quizzes that will be randomly given during classes.

The distribution of the grades will be as follow:

>94 A
90-94 A-
87-90 B+
84-87 B
80-84 B-
77-80 C+
74-77 C
70-74 C-
67-70 D+
60-67 D
<60 F

Paper: A required paper will determine the remaining 20% of the grade. The paper should be between 10 and 15 pages long (including tables and graphs). Additional instructions for the paper are attached to the syllabus. Although this class is not approved to satisfy the college writing requirements so the paper will be graded on multiple aspects: writing style, content, econometrics and statistical analysis. Following the theme of this class, the topic of the paper should be related to an environmental issue. The specifics of your paper will depend on data availability, but I strongly encourage you to think about an environmental theme you are passionate about.

Paper Presentation: If we have time we will have a few days for students to present their results. I know that students usually don't like the idea of an oral presentation in front of the rest of the class. At the same time, most of you will be looking for a job at the end of the year and, as you will discover, confidence in public speaking is a very important element of today's work environment. Think at the presentation as an excellent occasion to practice your public speaking skills and to show the rest of the class how hard you worked on your paper. All the students are required to participate in the presentation.

Important dates:
….:	Midterm 1
…..:	Deadline to submit proposal (3-5 pages).
…..:	Midterm 2
……:	Deadline to submit paper.
……:	Final (8:30am-11:00am)

Statistical package: For most of the assignments and for the paper you will need to analyze data using some statistical package. I recommend that you familiarize yourself as soon as possible with E-Views. E-Views is available on all computers in the econ lab. If you live on campus it may be possible to access E-Views from your room depending on how your computer is set up. If you are interested in this option you should contact Keith Sargent at ksargen@emory.edu.

Since the economics computer lab hours are very limited (9:30am to 4:30pm), you may want to find your own copy of E-Views. It is possible to by E-Views at a discounted price bundled with the book. The regular price for the student version is $40. The student version is somehow limited in the number of observations you can use and what you can do. The student version will be enough for this class. If you are (or think you will be) in the honor class or you plan to be working on this subject in the future you can order a full version of E-Views from the department for $100. This is incredible deal as the full price is over $800. You can find more information at the page: http://www.eviews.com/. I will organize review sections with the TA to introduce you to the use of EViews. Some of our regular classes will be scheduled in the computer lab.

Learnlink: The best way to reach me is via Learnlink. You should check our Learnlink conference at least once a day. (Notice that new message will NOT show up as a red flag until you are inside the conference). I set up a conference for the class with few sub conferences. Handouts will be given out in class and post on Learnlink. I also have a sub conference for private questions in which the rest of the class will be able to see the subject of your message but will NOT be able to read the content. If you have a question about the material that you think might be useful for the rest of the class you can post it in the "public question" folder and everybody will be allowed to read it and respond to it. Use the public conference is a great way to get a quick response! One of the sub conferences is dedicated to useful websites and includes some suggestions on where to find economic data. Feel free to add recommendations for the rest of the class.

Description of the Course: The course will cover several topics in Econometrics and Time Series that will give you the tools to understand and predict economic variables. The course is divided in two main parts. In the first parts you will be introduced to some basic econometrics concepts like linear regression, goodness of fit, parameter estimation, and hypothesis testing. The students that have already taken 420 will find the first part a review of some of the concepts presented in the Econometrics class. This part of the course is not emphasized in the textbook so I strongly recommend the use of some of the recommended book as a reference.

In the second part of the class we will focus on forecasting. I will introduce the concept of Time Series and the use of statistical graphics for forecasting. You will learn how to model some of the key component of Time Series like cycles, seasonality and trend. After the completion of this part, you should be able to take any common economic Time Series and find the model that best fit each component of the series. The goal of this class is to provide you with the knowledge and experience to recognize the most important features of any economic series. You will learn the tools necessary to estimate and evaluate econometric models that fit your data reasonably well and that allow the construction economic forecasts. The term paper is going to be your chance to combine all the knowledge acquired during the semester

A list of the main topics that we will cover during the semester is given below:

1. Introduction

2. Review of linear regression, testing and the use of dummy variables.
3. The use of statistical graphics for forecasting.
4. Outliers, correlation, partial correlation and the problem of scales.
5. Modeling and forecasting trends.
6. Modeling Seasonality.
7. Cycles, Covariance stationary time series and white noise processes.
8. The use of the lag operator and the Box-Jenkins methodology.
9. MA, AR and ARMA models.
10. Forecasting AR, MA and ARMA models.
11. Forecasting with regression models.
12. Forecasting using smoothing techniques.
13. Evaluating and combining forecasts.
14. A quick overview of unit roots and stochastic trends.

Instructions for the paper

You should start thinking of an idea for you paper right away. You will have to collect the data on your own, so you will need to check that the data you have in mind is easily available. A great idea will not get you too far if you find out shortly prior to the paper due date that the desired data does not exist. On submission of your proposal, you will need to demonstrate that you have the data in hand. Although I would prefer you to come up with an idea or your own, I am available to assist in formalizing an idea or finding data. One possible source for data is the Internet, where a huge amount of data is available for free. In this class we will mostly look at Time Series, so you will be able to apply what we learned in class only if you collect this kind of data. For example, baseball statistics for different teams will not work, while US GDP over time would be suitable.The paper will be graded on the content, style, and clarity of exposition with fairly equal weights. Make sure you spell-check your paper before you turn it in. The paper should include separate sections for each of the following: Abstract, Introduction, Data Description, Empirical Methods, Results, Conclusion, and References. You can place tables and graphs directly in the text or you can combine them at the end of paper in between the Conclusion and References sections.

The Abstract includes a brief synopsis of your paper. This section should be on the same page of the title (10-point font, 1.5 lines spaced). The rest of the paper should be typed at 12-point font double-spaced. The Introduction is used to explain the background of your paper, why it is important, and to explain in further detail what your paper is going to show. Data Description includes a detailed description of the data, including source and frequency. The Empirical Methods section is used to explain the empirical methods used in your analysis. This section needs to be precise so anyone reading your paper should be able to obtain the same data, follow your methods, and replicate your results exactly. The Conclusion needs to clearly state your results and concluding remarks, and your References need to be formatted in the standard method. All the sections should be numbered (I-V) with the exception of the Abstract and your References sections. All the pages have to number starting from 0, which is the number for the title/abstract page. The number on the title page should not be visible.
Any data used, methodology employed, or argument advanced that is not your own must be cited. You reference a source in the body of your paper by stating the name of the author and the publication year (e.g. Hansen (1995)). You must include all references that you have cited in the paper listed in alphabetical order in the References section of your paper. The following page is an example of a title/abstract page. I am also giving you examples of how to reference articles and books.

ELEMENTS OF FORECASTING APPLIED TO GDP.

Elena Pesavento

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Spring 2002

Abstract

Here you can write the abstract. It should not be too long and should include a brief introduction explanation of the results you find. It should be self explanatory, simple and captivating such that it invites the reader to continue with the rest of the paper.

You could have up to 10-12 lines here.

How to reference a book:

Banerjee et al. (1993): *Co-Integration, Error Correction, and the Econometric Analysis of Non-Stationary Data*. Oxford University Press.

How to reference articles:

Banerjee et al. (1998): " Error-Correction Mechanism Tests for Cointegration in a Single-Equation Framework", *Journal of Time Series Analysis,* 19, 3, 267:283.

Bewley R. and M.Yang (1998): "On the size and Power of system tests for cointegration", *The Review of Economics and Statistics,* 80(4), 675-679.

Boswijk, H. P. (1994): "Testing for an unstable root in conditional and structural error correction models", *Journal of Econometrics,* 63, 37-60.

Boswijk, H.P. and P.H. Frances (1992): "Dynamic specification and Cointegration", *Oxford Bulletin of Economics and Statistics,* 54, 3, 369:381.