In order to emphasize sustainability issues in the context of economic analysis, I have incorporated environmental issues into my Econometrics 420 course. This is a practical course that allows students to apply statistical methods to uncover patterns in real-world data, analyze the relationships between variables, and provide policy recommendations based on the empirical analysis. I am using many examples both in class and in the homeworks and refer to research articles that use econometric techniques discussed in class. Students are required to demonstrate their knowledge of econometric techniques by completing a project on a topic of their choice that is due at the end of the course. Last Fall, my students have shown a substantial interest in environmental topics in their empirical projects. Given an increased importance of environmental issues in global context in general, I have updated my course to incorporate examples and articles related to these important questions. Participation in the Piedmont Project helped me to get a perspective on sustainability issues and develop new ways to engage these topics in my course. As a result, I have added readings, examples, homework assignments and exam questions related to the topics of sustainability that are crucial to know for a modern economist.

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ECON 420: Econometrics
Fall 2009

Class Time and Location: TTH 4:00 pm – 5:15 pm in WH102
Office Hours: TTH 2:00-4:00 pm, or by appointment
Tutoring Help: For information about tutoring go to http://economics.emory.edu/tutor.htm

Prerequisites: Econ 220 (Introduction to Statistical Methods). I will assume that you have a basic background in probability and statistics. If you have not taken Econ 220, please let me know immediately. No background in econometrics is required.

Course Description: This course is designed as a first undergraduate course in econometrics. It will introduce you to the science of using economic theory and statistical techniques to analyze economic data. In today's information-intensive world, econometric skills are in high demand and can substantially expand your job opportunities. After a brief review of basic probability and statistics, we will learn how to estimate and interpret linear regression model and perform inference both in finite and large samples. You will learn how to use econometric tools to critically evaluate empirical studies that you may encounter in your job or research. By the time you leave the course, you should be able to postulate a research question, formulate and estimate a model that helps to answer this question, interpret your estimation results and perform hypothesis testing. Given the nature of your data and research question, you will learn how to choose among many modeling techniques, including linear and nonlinear regression, regression with binary dependent variable, panel data regression, instrumental variables estimation, and time series analysis.

Required Textbook:
Stock, James H. and Mark W. Watson, Introduction to Econometrics, 2nd edition, Pearson Addison-Wesley, 2007, ISBN: 0-321-27887-9

The web page for this book, which contains student resources, is:
http://wps.aw.com/aw_stock_ie_2/

Recommended Textbooks:
Gujarati, Damodar, Basic Econometrics, any edition, McGraw-Hill
Wooldridge, Jeffrey M., Introductory Econometrics: A Modern Approach, 3rd edition, Thompson: South-Western, 2006
Ramanathan, Ramu, Introductory Econometrics with Applications, 5th edition, 2002
Newbold, Paul, Statistics for Business and Economics, any edition, Prentice Hall - provides a good review of basic statistics.

I would strongly recommend you to read The Wall Street Journal (wsj.com), The Economist (economist.com), or The New York Times (nytimes.com) on a daily basis. This can help you to connect current events to the material you learn in this and other economics classes. To subscribe to The Wall Street Journal, you can go to www.WSJStudent.com. Student subscription is available at a highly discounted price.

Grading: Your grade will be based on 2 midterms, a final, 5 assignments, and a project:
Midterm 1: 15%
Midterm 2: 15%
Final: 35%
Assignments: 15% (3% for each assignment)
Project: 20%

The final exam will be comprehensive. There will be no make-ups for the exams. If you cannot take an exam at the scheduled time, let me know in advance. Otherwise, you will receive a grade of zero for that exam. The assignments are due at the beginning of the class. I encourage you to work in groups for the assignments and the project. However, each member of a group must hand in his/her own assignment. For the assignments, the groups can be any size. For the project, the maximum group size will be 2, and only one paper needs to be handed in per group. The project is due on the last day of lectures (Tuesday, December 8).
Class attendance is not required but is strongly recommended as both the exams and assignments are based on the material covered in class. Bonus points (up to 5% of your total grade) will be given for pop-up quizzes randomly given in class.

The grade scale will be as follows:
94-100 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

0-60 F

Project: The project is a 10-15 pages paper discussing applied econometric analysis of selected macroeconomic or other variables of your choice. In you research project, you will set up and estimate (using **multiple regression** analysis) an economic model and interpret the results. Overall, the project should discuss economic relationships between your chosen variables using both economic intuition and econometric techniques. Your aim should be to conduct an applied econometrics project similar to those found in the professional literature. The paper will be graded on writing style, content, and econometric analysis. You can either form a group with one other member of the class to conduct a joint research project or work individually. If you choose to work in a group, only one project needs to be submitted per group.
The paper must include the following:
1) an explanation of the economic model and equation(s) chosen for estimation,
2) the description and source of the data used in the analysis,
3) a discussion of the problems suspected and/or detected in estimation, and
4) the hypothesis test(s) suggested by the model and an interpretation of the results.

You can choose any topic that you find interesting and that is related to macro- or microeconomics. You may get some ideas from other economics courses, examples presented in econometrics textbooks, your computer assignments, or in classroom. I encourage you to form groups and start thinking about the topic that you would like to analyze early in the semester. Each team is required to submit a brief project proposal identifying the topic you will investigate, the variables included and the data you plan to use, sketching a tentative model for estimation, describing hypotheses to be tested and questions to be addressed, and providing some background literature relevant to your project. This can be done in 2-3 pages. One purpose of this proposal is to have you identify your data sources early in the semester, so that you will not end up later with a project that is not feasible for lack of data. You might want to choose an existing dataset to conduct your research or you can choose to build your own dataset. The proposal is due on Tuesday, November 3. You can discuss your ideas with me at any time during the development of your project. We will have a class session with the staff of Electronic Data Center (EDC) in the Woodruff Library on September, 19. Rob O-Reilly, the director of the EDC, will familiarize you with available data resources and will show you how you can access the economic data you may want to use for your paper. Throughout the course, we will read and discuss economic research articles that use econometric techniques discussed in class. Focusing on the assigned readings and actively participating in classroom discussions is crucial for mastering the material and producing a good research project.

Once I have returned your project back and we have agreed on a topic, you should collect the necessary data and proceed with the estimation. An important part of your project is to identify possible econometric problems in your data (heteroscedasticity, multicollinearity, autocorrelation, measurement error, etc.) and to deal with them using procedures we will learn in the course. You should be able to interpret your results and test any hypotheses of interest.

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

1. Abstract (short summary of the paper following the title).

2. Introduction (an overview of the research question: why it is important to study and what you would like to show in your paper).

3. Data Description (a detailed description of your data: sources, definitions of variables that you are going to use in your analysis).

4. Empirical Methods (a step-by-step explanation of what empirical methods you use and how these methods are used to answer your research question).

5. Results (presentation and discussion of results: estimated equations and summary statistics, diagnostic tests for various econometric problems and description of solutions, hypothesis testing).

6. Conclusion (a summary of your findings and concluding remarks, implications of your results for theory and policy, suggestions for further research).

7. References (an alphabetical list of cited works, they should be referenced in the text as, for example, Watson (2007)).

All sections except the abstract should be typed at 12-point font double-spaced, the abstract should be typed in 10 points, 1.5-line spaced.

Software: You will be required to use Stata software package for completing assignments and the project. I recommend that you familiarize yourself as soon as possible with Stata. Stata is available on all computers in the econ lab and in Cox Hall. Although we will focus on Stata in class, you may use any other software package to complete course assignments or project. We will also hold a few computer lab sessions to familiarize ourselves with Stata. I will distribute handouts before each lab session that will make these classes more efficient. If you have any problems, don't hesitate to approach me either by e-mail or in person.

Blackboard: I will post announcements, syllabus, home assignments, lecture notes, useful links, and other course-related material on Blackboard. You should check Blackboard web-site regularly for updates..

Honors Code: Students will adhere to the Emory College Honor Code. Academic misconduct will not be tolerated and may result in your removal from the course.

Important Dates:

Tuesday, October 13	Midterm 1
Tuesday, November 3	Deadline to submit project proposal (3-5 pages)
Tuesday, November 17	Midterm 2
Tuesday, December 8	Deadline to submit the paper
Wednesday, December 16	Final

Tentative Course Outline:

	Topics Covered	Readings
08/27	Introduction to Econometrics: Economic Questions and Data	S&W, Ch.1
	- Czech, Brian, "The Imperative of Macroeconomics for Ecologists", BioScience, 2002 -Helland, Eric and Alexander Tabarrok, "Race, Poverty, and American Tort Awards: Evidence from Three Data Sets ", The Journal of Legal Studies, 2003	
09/01, 09/03	Brief Review of Probability and Statistic	S&W, Ch.2-3
09/08-09/10	Linear Regression with One Regressor	S&W, Ch.4
09/15-09/17	Hypothesis Tests a Linear Regression with One Regressor	S&W, Ch.5
09/22-09/24	Linear Regression with Multiple Regressors	S&W, Ch.6
09/29-10/01	Hypothesis Tests in Multiple Regressions and Examples	S&W, Ch.7
	-Donohue, John J. and S.D. Levitt, "The Impact of Legalized Abortion on Crime", Quarterly Journal of Economics, 116 (2), 2001, pp. 379-420 -Thomas Dietz*, Eugene A Rosa, and Richard York, "Driving the Human Ecological Footprint" Frontiers in Ecological Environment, 2007, 5(1), pp.13–18. -Amato, Louis and Ronald P. Wilder, "The Effects of Firm Size on Profit Rates in U.S Manufacturing," Southern Economic Journal, 1985	
10/06	MIDTERM 1	Chapters 1-6
10/08-10/13	Nonlinear Regression Models	S&W, Ch.8
10/15-10/20	Nonlinear Regression Models and Examples	
	- Sommers, Paul M. and Noel Quinton "Pay and Performance in Major League Baseball: The Case of the First Family of Free Agents," Journal of Human Resources, 1982	
10/22	Assessing Studies Based on Multiple Regression Analysis	S&W, Ch.9
	- Fullerton, Don and Thomas C. Kinnaman, "Household Responses to Pricing Garbage by the Bag," American Economic Review, 86, 1996, pp.971-984.	
10/27-10/29	Regression with a Binary Dependent Variable	S&W, Ch.10
11/03	Regression with a Binary Dependent Variable and Examples	
	- Bertrand, Marianne and Sendhil Mullainathan, "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination," American Economic Review, 94(4), 2004, 991-1013 - Duggan, M., and Steven Levitt, "Winning Isn't Everything: Corruption in Sumo Wrestling," American Economic Review, 92(5), 2002, 1594-1605 - Sacerdote, Bruce, "How Large Are the Effects from Changes in Family Environment? A Study of Korean American Adoptees," Quarterly Journal of Economics, 121(1), 2007, 119-157	
11/03	Deadline to submit project proposal	
11/05-11/10	Regression with Panel Data	S&W, Ch.11
11/13	Regression with Panel Data and Examples	
	- Ayres, Ian and Steven Levitt, "Measuring Positive Externalities from Unobserved Victim Precaution: An Empirical Analysis of Lojak," Quarterly Journal of Economics,	

	115(3), 2000, pp.755-789. - Card, D., and A.B. Krueger, "Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania," American Economic Review,1994, pp.722-794. - Chay, K. Y., and M. Greenstone ,"Air Quality, Infant Mortality, and the Clean Air Act of 1970", Working Paper.	
11/17	MIDTERM 2	Chapters 7-11
11/19-11/24	Instrumental Variables (IV) Regression	S&W, Ch.12
12/01-12/03	Instrumental Variables (IV) Regression and Examples	
	- Angrist, J.D., and W.N. Evans, "Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size," American Economic Review, 88(3), 1998, pp.450-477. - Levitt , Steven D., "The Effect of Prison Population Size on Crime Rates: Evidence from Prison Overcrowding Litigation", Quarterly Journal of Economics 111(2), 1996, pp. 319-351.	
12/08	Review, Deadline to submit the project	
12/16	FINAL EXAM	Chapters 1-12