

ECONOMICS 725
SAN FRANCISCO STATE UNIVERSITY
Spring 2009

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Applied Data Analysis in Economics

In last three decades, the trend in economics is to use more and more applied data analysis. The intent of this course is to provide real world examples and training to many of the common techniques used in data analysis in the public and private sector. In short, the class covers various topics of what might be asked of a job classified as “analyst.”

This class has three goals: 1) to instruct students in the tools of data analysis, 2) to provide students with a working knowledge of basic computer software used by research analysts, *SAS and Stata*, and 3) to teach some commonly applied econometrics and modeling.

The instructor's perspective for this class is to teach applied techniques. The approach is to learn by doing. As such, many of the techniques are illustrated and explained using example rather than being carefully built up from statistical and econometric theory. The instructor believes that theory is important and that this class is no substitute for a rigorous class in econometrics such as Economics 730. In fact, the **class pre-requisite** is undergraduate econometrics (Economics 630) or the equivalent material contained in the first 7 chapters of Wooldridge or the first 9 chapters of Stock and Watson.

Textbooks:

The text for the class is James H. Stock and Mark W. Watson, Introduction to Econometrics, 2nd edition. I also highly recommend Peter Kennedy's, A Guide to Econometrics.

Evaluation:

Students will be evaluated using the following criteria. You must complete 2 projects reflecting applications of the techniques gained in this class. The due dates for each of the projects are given in the syllabus. Labs must be completed within one week of class to obtain credit. Finally, you must give a presentation of one of your projects. Presentation skills are important as an analyst or teacher of economics.

Projects:	60%
Labs:	30%
Presentation:	10%

Please note that no late work will be accepted. This is a time intensive class so you must keep up. I do not recommend taking this class unless you are committed to 10-15 hours a week for this class.

Each project will consist of a 4 to 6 page typed project summary. The project summary will include: a) a description of the basic topic, b) a discussion of the basic analytic technique, c) source of data, d) a discussion of findings and their implications, and e) a defense of the results. The projects utilize techniques discussed in the class based on a topic of your interest. Your project must be original. It cannot be a replication of an econometrics exercise from other classes or texts.

Economic Modeling and Computer Simulation (continued)

Date	Topic and Reading
Jan. 29	Introduction to class; Introduction to surveys and survey data; Introduction to SAS and UNIX. LAB 1. UNIX commands, SAS at SFSU handout. Chapter 1. DiIorio, Frank and Kenneth Hardy, <u>Quick Start to Data Analysis with SAS (QSDA-SAS)</u> .
Feb. 5	Questionnaire issues, coding, data preparation, missing data and two variable analysis of survey data. Chapters 5, 6, and 8 in <u>Survey Research Methods</u> . LAB 2: Basic statistics using SAS. (2 Variable Hypothesis Testing) Chapters 3 and 4 in <u>Survey Research Methods</u> . Chapter 1. DiIorio, Frank and Kenneth Hardy, <u>Quick Start to Data Analysis with SAS (QSDA-SAS)</u> .
Feb. 12	Data analysis by subgroups. LAB 3: Using SAS to prepare data. Census PUMS data, merging data sets, data manipulation, city level wage regressions.
Feb. 19-26	Hierarchical data files, functional forms, heteroscedasticity, Qualitative choice models: probit and logit models. Chapters 8 and 11 in IE. LAB 4. Non-Linear Functions. LAB 5. Linear probability, logit, and probit regressions and testing using SAS. (labor force participation of women)

Methods in Data Analysis for Economics (continued)

Week	Topic and Reading
March 4-11	Instrumental Variables and Simultaneous Equation Models. Chapter 12 in IE. LAB 6: INSTRUMENTAL VARIABLES. LAB 7: TWO STAGE LEAST SQUARES MODEL.
March 18 -April 2	Panel data methods; difference in difference models, fixed effects models,. random effects models. Chapters 10, 13 in IE. Chapter 14 from Wooldridge, <u>Intro to Econometrics</u> . LAB 8: FIXED EFFECTS MODELING. LAB 9: RANDOM EFFECTS MODELING.
March 25	SPRING BREAK – NO CLASS.
April 9-16	Intro to Time Series – Part 1. Time trends, autocorrelation, autoregressive and moving averages (ARMA) models. Chapter 14 in IE, pp. 525-554. PROJECT 1. CROSS SECTION DATA PROJECT DUE APRIL 9. LAB 10: CORRECTIONS FOR SERIAL CORRELATION. LAB 11: AUTO REGRESSIVE MOVING AVERAGE MODELS.

Methods in Data Analysis for Economics (continued)

Week	Topic and Reading
April 23	Stationarity, Dickey-Fuller Test, and Distributed lag models. Chapters 14, pp. 554-580, 15 in IE. LAB 12: THE DICKEY-FULLER TEST AND STRUCTURAL BREAKS. LAB 13: AUTOREGRESSIVE DISTRIBUTED LAG MODELS.
April 30	ARCH/GARCH, VAR MODELS. Chapters 14, pp. 554-580, 15 in IE. LAB 14: VAR MODELING.
May 7	Cointegration and Error Correction models. Chapter 16 in IE. LAB 15: ERROR CORRECTION MODEL.
May 14-21	PROJECT PRESENTATIONS. PROJECT 2. TIME SERIES PROJECT DUE, MAY 21.