

1-1-2010

(2) Sample Syllabus: Econ 4060

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Marquette University
Economics 4060-101 Introduction to Econometrics Spring 2010

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Text, Software, and Related Materials: *Using Econometrics 5th Edition*, by Studenmund, Addison Wesley, 2005, ISBN: 0-321-31649-5

This course will make extensive use of an econometrics software -- EViews. You can either buy the student version if you want to use your own PC at home, or you can use the software that is installed in the PC Lab in Straz Hall and the library (everywhere except stand-up only computers, laptops, and Macs). If you are not from the COB, but would like to use the computer lab in Straz Hall, you can get your ID activated to enter the lab by emailing your name and MU ID to (biz@marquette.edu).

Some materials presented in class might not be included in the textbook. Do not ignore the information presented in class just because it does not appear in the textbook. You are responsible for all materials in lectures and homework assignments.

Course Description and Objectives: Econ4060 introduces students to regression methods for analyzing data in economics and related areas. This course emphasizes both the theoretical and practical aspects of statistical analysis, focuses on techniques for estimating econometric models of various kinds and interpreting the estimates from such models.

When you complete this course you will be able to gain an understanding of the process of econometrics -- specify an econometric model that describes some economic or business phenomena; use statistical data to estimate the model; test hypotheses about the phenomena, and forecast future behavior. You will know some of the fundamental tests econometricians use to evaluate models, and to remedy the most common problems that econometric models have. You will be able to understand a good portion of empirical economics literature and communicate knowledgeably with professionals.

Prerequisites: The prerequisites for this course are econ2003 (Principle Microeconomics) and econ2004 (Principle Macroeconomics), Mana2028 or Math1700 (Statistics). Students are expected to have basic geometric and algebraic skills.

D2L: Important information will be available to you at the D2L site for this course. There you will find the course syllabus, announcements and other materials for our course. If slides are used, they are available through D2L on Sunday by 5pm for the coming week's lecture.

Homework Assignments and Exams: Five homework assignments and three exams will be given. Homework assignments are individual assignments and identical copies from students will not be accepted. No assignment may be made up or turned in late and no makeup exam will be given. Assignments constitute 20% of your final grade. Exams constitute 54% of your course grade. If needed, do not hesitate to discuss your exam grading with me in my office. Please note that the discussion must be done within one week following the return of the exam. Otherwise, the grade will stand as originally recorded.

Research Project: There is an econometrics research project for this course. The research project includes three project assignments, a proposal (2% of course grade), a preliminary model (8%), and the final paper (16%). The project assignment is described in detail at the end of the syllabus.

Grading

93-100 A
88-92 AB
82-87 B
76-81 BC
70-75 C
64-69 CD
60-63 D
Below 60 F

Attendance: The College of Business Administration attendance policy states that: “*A student is expected to attend every exercise of the courses in which he or she is registered. Any absence, regardless of the reason, will prevent the student from getting the full benefit of the course and renders a student liable to university censure. Since it is assumed that no college student will be absent from class without reason, this college will not differentiate officially between excused and unexcused absences.*

When a student has absences in hours equal to two weeks of class periods, he or she may be dropped without warning, earning a grade of WA, at the request of the instructor or the dean of the college. After the WA grade has been issued, the student may not apply for a grade of W. All students enrolled in courses taught by the College of Business Administration must conform to the attendance policy in effect in the College of Business Administration even though they are registered through another college or division of the university.”

Classroom Courtesy: Please arrive on time and leave after I complete class materials. It is disruptive when a student arrives 10-15 minutes late. If you must come in late, find a seat next to the door to minimize the disruption. If you must leave class early, inform me at the beginning of the class and also find a seat next to the door.

While in class, please respect the right of your fellow classmates and the professor to a quiet and orderly class atmosphere by turning off your cell phone or any other electronic communication devices that may disturb the learning process.

Academic Integrity: Cheating on homework, exams, or plagiarism in any form, is in violation of the university's academic honesty policies. Disciplinary action may be initiated by the University against any student found guilty of dishonesty, including academic cheating and academic plagiarism. The penalties for cheating may include an "F" for your final course grade.

Students with Special Needs: Please inform me during the first week of class if you have any conditions that may limit or affect your ability to participate in this course so that we can make necessary arrangements. You may also contact the Office of Student Educational Services (OSSES), in AMU 317 (8-3270) for more information (see also: <http://www.marquette.edu/oses/>).

Emergency Plan: From the Office of Risk Management and Public Safety: Every Marquette University campus building has emergency shelter and evacuation plans. Please familiarize yourself with the plans of each building in which you take classes or attend meetings. Make sure to note the routes to the lowest level of the buildings for shelter during inclement weather, as well as exits from the buildings in the event of fire or other emergency.

College Undergraduate Assessment Process: The fundamental mission of the College of Business Administration is to provide a quality education grounded in Catholic, Jesuit intellectual values. Students are expected to learn how to function effectively in a diverse and global economy and develop into responsible members of the business community. As one of many methods of assuring that the goals of our educational mission are successfully met, the college regularly and systematically engages in the assessment of these competencies

Students in the Bachelor of Science in Business Administration program are assessed on their ability to reason ethically, communicate effectively, analyze critically, and understand local, national and global business and cultural issues. Students in our MBA programs are also assessed on their competency to communicate effectively, reason ethically and apply critical thinking, as well as their capacity to comprehend the global strategic issues of firms and perform fundamental activities of business managers. Students in our other graduate programs are assessed on specific competencies related to their disciplines.

Assessment takes place each semester in all programs and settings using quantifiable measures to gather and analyze information to help continuously improve the educational process. The College of Business Administration is dedicated to successfully providing a quality education for all students. Assessment is the continuous improvement process of evaluating our success. The learning objective of the economics department is that our students will be able to apply the standard analytic tools of applied economic analysis to business situations. More information on assessment can be found at <http://www.busadm.mu.edu/undergraduate/LearningObjectives.shtml>

The college's general undergraduate assessment goals are:

Apply effective written and oral communication skills to business situations

Analyze the global business environment

Analyze the local business environment

Use critical thinking skills in business situations

Apply an ethical understanding and perspective to business situations

Tentative Course Outline

Welcome to Econometrics! The following is a tentative schedule. If you are unsure of your reading responsibilities, just ask. **The instructor reserves the right to alter the outline when necessary. Both the extent and timing of coverage may change.**

Week 1: Jan 19, 21. Introduction Chapter 1

- Definitions
- Methodology
- Simple Linear Regression
- Estimated Regression Model

Week2: Jan 26, 28. Ordinary Least Squares (OLS) Chapter 2

- Theory and Examples of OLS Estimation
- Theory and Examples of Multiple Regression Models
- Variance Decomposition and Goodness of Fit

Week 3: Feb 2, 4. Using Regression Analysis and classical model Chapters 3, 4

- Regression Analysis in Practice
- Classical Assumptions
- OLS is BLUE

Homework assignment 1 due on Feb 4 (Each homework is posted in D2L a week before its due date. For example, the first assignment is posted in D2L on Jan 28 by 5pm.)

Week 4: Feb 9 Classical Model (cont) Chapter 4

- Classical Assumptions
- OLS is BLUE
- Project proposal due on Feb. 11***

Weeks 4, 5: Feb 11, 16, 18. Hypotheses Testing Chapter 5

- Null and Alternative Hypotheses
- Type I and Type II error
- Statistical significance
- Homework assignment 2 due on Feb. 18***

Week 6: Feb 23. Hypotheses Testing (cont) Chapter 5

- Test of a Single Coefficient
- F-test, applications of F-test
- Exam 1 on Feb. 25***

Week 7: Mar 2, 4. Problems in Model Specification Chapter 7

- The Choice of a Functional Form
- Dummy variables

Week 8: Mar 9, 11. Problems in Model Specification (cont.) Chapter 7

- Preliminary model specification due on Mar 11***

Week 9: Spring Break

Week 10: Mar 23, 25. Multicollinearity Chapter 8
Problem of Multicollinearity
Remedies
Homework assignment 3 due on Mar 25

Week 11: March 30 Heteroskedasticity Chapter 10
Testing for Heteroskedasticity
Remedies

Week 12: April 6, 8 Heteroskedasticity cont., Omitted Variables Chapters 10, 6
Omitted variables
Irrelevant variables
Homework assignment 4 due on Apr 8

Week 13: April 13, 15 Serial Correlation Chapter 9
Positive and Negative Serial Correlation
Consequences of Serial Correlation
Durbin-Watson test of Serial Correlation
Generalized least squares
Exam 2 on April 15

Week 14: April 20, 22 Dummy Dependent Variable Techniques Chapter 13
Linear Probability Model
Dummy Dependent Variable Techniques
HM5 due on Apr 22

Week 15: April 27, 29 Time Series Chapter 12
Unit root
Non-stationarity
Granger Causality
Final paper due April 29

Week 16: May 4, 6 Continue with Time series Chapter 12

Exam 3 on May 14 10:30am-12:30pm

Dr. Wang

You are to undertake an empirical analysis of an economic relationship or a hypothesis inferred from either micro or macroeconomic theory. Your project should state the topic and discuss the relevant theory and literature on the subject. Specify your theoretical model and justify its arguments. Then you should specify a multiple regression model of the theoretical model and provide your empirical estimate of the regression model. Finally, you report your findings and the process by which you performed your research. These steps in applied regression analysis are described in detail in Chapter 3 of Studenmund.

All three research project assignments should be typed with font size 12 and double spaced. Margins should be set at one inch on all four sides.

Feb. 11 Project proposal is due, which includes:

- A working title
- A 1-2 paragraph project description. It describes what you will discuss in the paper and why it is important.
- Best guess of what are your dependent and independent variables
- Two potential data sources for your study
- Whether you think your data set will be time-series or cross-sectional.

Mar 11 A preliminary model is due, which includes (the assignment should not exceed 8 pages, excluding the bibliography):

- A working title
- Based on the papers you have reviewed, describe the theoretical regression model that you plan to estimate. Note that you don't have to provide the literature review.
- Define your dependent and independent variables (e.g. the dependent variable is economic growth, which is the growth rate of per capita real GDP)
- Data Sources (e.g., investment comes from U.S. Department of Commerce; economic growth rate is collected World Development Indicators by the World Bank).
- A complete bibliography in good bibliographic form. You do not have to read all the papers in your bibliography at this time. The format of your bibliography does not matter and you can use any of Harvard, Chicago, APA, ALA styles. But you need to be consistent once a style is chosen.
- Hypotheses which will be tested (such as what signs do you expect the coefficients to have and why; null and alternative; One vs. two tailed tests)
- Specific form of the equation to be estimated if possible.

Apr 29 The final research paper draft is due.

A guideline for the final research paper and submission requirement will be posted later this semester in D2L.

Once you receive comments from me at each stage, you should 1) incorporate the comments in the final draft and 2) keep your original submission in a folder to be handed in with the final paper. The grade you receive on the final draft of the paper will reflect the degree to which you responded to comments and suggestions on your initial submissions. Keep a copy of the final draft for yourself.

CHOOSING A TOPIC

There are several ways to choose a topic. You may have a special interest of your own that you would like to investigate, perhaps related to term papers you have written in another class. You can review the literature in search of an unsettled issue. For example, do tax cuts increase or decrease government budget deficits? Alternatively, you may choose a well-established hypothesis and test it using more recent data. In fact, Studenmund's text contains numerous examples of the type. Choose one of these and expand the sample size, or use more recent data, or apply the model to a different country or industry, or modify the model or estimation technique, or test a related hypothesis, etc. To help you choose a topic for your project, here is a list of topics that have been chosen by others in this class. It is permissible to choose one of these topics, as long as you do your own work. Please feel free to discuss your ideas for a topic with me before submitting your project proposal.

DATA SOURCES

Data collection and formatting can be quite time consuming. So it is a good idea to start as early as possible looking for different data sources.

One of the most often used sources is the **World Development Indicators (WDI)** published by the World Bank. WDI includes a large number of development indicators, such as GDP, inflation, and phone subscriptions, for 209 countries over decades. Our library provides direct access to this on-line data set. Just search by title at the library homepage and follow the instructions.

I recommend that you collect data for your project from WDI given its coverage and reliability. One warning is that the data set has many missing values, meaning missing data for some countries over some years, especially for less developed countries.

Political risk index, part of International Country Risk Guide constructed by the Political Risk Services Group, is a composite score from 12 components (corruption, internal conflicts, etc). It measures a country's political risk/stability and ranges from zero (very risky) to 100 (extremely stable). You can go to <http://www.prsgroup.com/ICRG.aspx> to read more about this index. If you need this variable for your project, please let me know.

Human capital: Human capital constructed by Barro and Lee (1993, 2000) is widely used in different studies. Their human capital is measured by average years of schooling at the primary, the secondary, and the tertiary level. Data are available for approximately 100 countries (missing values may occur) every five years (1970, 1975, 1980,...). The last year with available data is 1999 instead of 2000. This data set is available at Center for International Development at Harvard University, <http://www.cid.harvard.edu/ciddata/ciddata.html>

Federal Reserve Bank St. Louis provides a data series **Federal Reserve Economic Data (FRED)** free to the public. It covers time series data (interest rate, exchange rate, CPI, GDP, etc) for the U.S.

Bureau of Economic Analysis provides U.S. national (GDP) and international data (U.S. trade, U.S. investment abroad, foreign investment in the U.S.) in detail.

Surveys: There are certain labor economics surveys which include data at the individual level such as age, income, and education. If you would like to conduct a project, for example, on the relationship between individual's education and income or whether gender affects earnings, please let me know.

Barro, Robert J., and Jong-Wha Lee. 1993. International Comparisons of Educational Attainment. *Journal of Monetary Economics*. v32 (n3):363-94.

Barro, Robert J., and Jong-Wha Lee. 2000. *International Data on Educational Attainment: Updates and Implications*. Center for International Development at Harvard University, CID Working Papers.

SOME OF THE TOPICS RESEARCHED IN THIS COURSE IN THE PAST

Tax Deductions and Charitable Contributions
Determinants of Labor Force Participation by Women
Southeast Wisconsin Housing Prices
The Effects of Advertising on the Sales of Sporting Goods
US budget deficits and GDP growth
The Determinants of Total Revenues of Major League Baseball Teams
The Demand for Major League Baseball in the Wake of the 1994 Labor Strike
The Determinants of High Inflation Rates in Brazil, Chile, and Peru
Environmental Kuznets Curve
FDI and Economic Growth
Trade and Economic Growth
The Relationship Between Population Growth and Economic Development
An Econometric Model of the Determinants of Volume of Trade
A Study of the Effect of Catholicism on the U.S. Divorce Rate
An Empirical Investigation of the Relationship between Income Inequality and Economic Development
An Econometric Model of the Decision Faced by Unmarried Pregnant Teenagers
Effects of Research and Development and Advertising Expenditures on Sales
Labor Force Participation Rate of Women
The Decline in the US Savings Rate
Education and Income
Earning Differentials Between Males and Females, and Whites and Non-Whites
An Econometric Analysis of Employment of Nurses
The Effect of the 1987 Stock Market Crash on Consumption of Durable Goods
The Effect of Exchange Rate Volatility on the U.S. Output: 1968-1988
Determinants of MLB players' income