

UNIVERSITY OF GUELPH
College of Management and Economics
Department of Economics and Finance

ECON*4640/6050 - Applied Econometrics

Fall 2011

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Office: Rm 743, MacKinnon Building.
Office Hours: Mon., Wed., 10:00-11:20 am

It is your responsibility as a student to be aware of and to abide by the University's policies regarding academic misconduct, e-mail communication, maintaining copies of out-of class assignments, what to do when you cannot meet a course requirement and the drop date for this semester. To better understand these policies, visit:

<http://www.economics.uoguelph.ca/student-responsibilities-policies.asp>

This is the first graduate level course in econometrics, and is also suitable for undergraduates who have completed EC3740 (Introduction to Econometrics). The expectation is that students in this course have an understanding of probability (conditional expectations) and basic statistics. We will review basic concepts in matrix algebra, but it is also expected that students have used matrix algebra and multivariate calculus previously.

We will cover regression analysis, including instrumental variable, differences-in-differences, and panel data estimation. We will focus on estimating causal effects, and understanding the difference between these and conditional associations. We will learn how to construct estimators that provide identification in a way that is credible to academic economists. While we will start from the beginning of econometrics, with basic regression, we will move rather more quickly than in 3740.

Lectures: Tuesdays and Thursdays

Labs: You will be assigned a lab in the first week. Lab attendance is essential to understanding the course material.

Text books:

Required: Joshua D. Angrist and Jörn-Steffen Pischke, Mostly Harmless
Econometrics: An Empiricist's Companion, Princeton University Press, 2009 (MHE)

Supplementary: James H. Stock and Mark W. Watson, Introduction to Econometrics, 2nd edition,
Addison Wesley, 2007 (SW)

MHE is a book written primarily for PhD students with some prior training in econometrics, by two applied econometricians. The level of the book is above the level of this course. Nevertheless, many sections are accessible to senior undergraduates and graduate students with good statistical backgrounds. This book is available in electronic version as a PDF file.

SW is an undergraduate introductory textbook, and is available in the library course collection. There is no need to purchase this book. The level of this textbook is slightly below the level of this course. Although the main chapters are not very technical, the book is rigorous in many respects.

There will be regular problem sets, which will not be graded, but which will be important to overall understanding. Some of these will be written exercises, and some will be computer-based exercises, to be completed in the labs. You will have to solve the computer exercises using the statistical software Stata, and the data which will be provided on your course website. Doing these exercises will be very important to successful completion of the Major Project and exams.

Evaluation:

Midterm exam # 1: In-class. October 13th. 15%
Midterm exam # 2: In-class November 24th 15%

Major Project: due Nov. 17th 30%
Final Exam: 40%

Outline of the Course and Readings:

Week 1. Introduction
Causal questions and the selection problem
SW ch. 1
MHE ch. 2

Week 2. Bivariate Relationships in Data
Scatterplots, the conditional expectation function (CEF), linear regression, and basic properties of the CEF and linear regression
SW ch. 4, 17
MHE sect. 3.1.1, 3.1.2

Week 3. Samples and Estimation
Sampling and OLS regression, the sampling distribution, standard errors and hypothesis tests, homoskedasticity vs. heteroskedasticity
SW ch. 5

Week 4. Multivariate Regression
Regression and causality, the conditional independence assumption, short versus long

regression and omitted variables bias, the regression anatomy formula
SW ch. 6, 18
MHE sect. 3.2.1, 3.2.2

Week 5. Inference in Multiple Regression
t-tests, F-tests, R-square, tests involving multiple coefficients and joint hypotheses
S & W ch. 7

Week 6. Functional Form in Regression
Nonlinearity in variables, dummy variables, interactions, saturated models
SW ch. 8
MHE 3.1.4

Week 8. Regression Details
Weighting regression, binary dependent variables, logit, probit, and marginal effects
SW ch. 11
MHE sect. 3.4

Week 10. Instrumental Variables
SW ch. 12
MHE sect. 4.1

Week 7. Assessing Regression Studies
Internal vs. external validity, omitted variables bias, the role of controls and bad control, measurement error
SW ch. 9
MHE sect. 3.2.3

Week 9 and 10. Panel Data and Differences-in-differences
SW ch. 10
MHE sect. 5.1, 5.2

Weeks 11 and 12. Review for Final Exam

You will be asked to complete an evaluation of this course at some time during the last two weeks of the semester. The Department of Economics policy regarding the conduct and use of these evaluations will be found at:

<http://www.economics.uoguelph.ca/course-evaluation.asp>