

ECON 490: Topics in Nonlinear Econometrics

Spring 2018

Course Meeting: Monday, Wednesday 9:30-11:50 AM, Wohlers Hall 70B

Credits: 3

Professor: Russell Weinstein

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Office Hours: Wednesdays 11 – 12 and Thursdays 1 – 2, LER 205

Course website: compass2g.illinois.edu

Course Description

Duration analysis is used to address a wide range of questions relevant for policy organizations, central banks, the financial sector, and industry generally. Examples of these questions include: what is the probability that an individual will exit unemployment this week, given he has been unemployed for the past eight weeks; what is the probability that an individual defaults on their mortgage this month given they have not defaulted for the past 12 months; what is the probability that a firm adopts a new technology this year conditional on not having adopted for the past 3 years, and how does this depend on the firm's market share. The goal of this course is to develop the tools to understand, estimate, and interpret duration analysis models—statistical models used to analyze duration data. Students will gain practical experience organizing data and writing code for statistical software to estimate these models and better understand economic phenomena. Prerequisites include ECON 302 or 303, and ECON 471.

Course Texts

Cleves, Mario, William W. Gould, and Yulia V. Marchenko (2016): An Introduction to Survival Analysis Using Stata, Revised Third Edition, Stata Press.

Articles listed below can be obtained by searching in the University of Illinois Library Catalog (library.illinois.edu).

Topics and Readings

Week 1: Introduction to Survival Analysis [January 17]

Chapters 1-3

Week 2: Censoring, Truncation, and Recording Data [January 22, January 24]

Chapters 4-5

Week 3: Organizing and Preparing Data for Survival Analysis [January 29, January 31]

Chapter 6-7

Week 4: Nonparametric Analysis [February 5, February 7]

Chapter 8

Week 5: The Cox Proportional Hazards Model [February 12, February 14]

Chapter 9

Week 6: Estimating the Cox Proportional Hazards Model with Additional Covariates
[February 19, February 21]

Chapter 9

Week 7: Midterm [February 26 Review, February 28 Midterm]

Week 8: Diagnostics for the Cox Model: Testing for misspecification, outliers, goodness of fit
[March 5, March 7]

Chapter 11

Week 9: Parametric Models [March 12, March 14]

Chapter 12

Chapter 13 (only 13.1: The exponential model)

Spring Break March 17-25

Week 10: Parametric Models: Postestimation Analysis [March 26, March 28]

Chapter 14

Week 11: Power and Sample Size Determination [April 2, April 4]

Chapter 16

Week 12: Competing Risks [April 9, April 11]

Chapter 17

Week 13: Applications: Unemployment Durations [April 16, April 18]

DellaVigna, Stefano and M. Daniele Paserman (2005): "Job Search and Impatience," *Journal of Labor Economics*, Vol. 23(3).

Week 14: Applications: Bank Failures and Default Risks [April 23, April 25]

Whalen (1991): "A Proportional Hazards Model of Bank Failures: An Examination of its Usefulness as an Early Warning Tool," *Federal Reserve Bank of Cleveland, Economic Review*, Vol. 27(1).

Week 15: Applications: Technology Adoptions [April 30, May 2]

Levin, Levin, and Meisel (1987): "A Dynamic Analysis of the Adoption of a New Technology: The Case of Optical Scanners," *Review of Economics and Statistics*.

Activities and Grades

Grades are determined by the following rubric:

Weekly review questions: 10% (lowest dropped)

Lab Assignments: 30% (lowest dropped)

Midterm exam: 30%

Final exam: 30%

Each component is discussed below.

Weekly review questions Short assignments posted every week on the course website (compass2g.illinois.edu) to make sure you understand the readings. Assignments are due at the start of class.

Lab Assignments will be based on the practical application each week. In these assignments, you will be asked to describe the data, methods, and results from the in-class lab exercise each week.

A midterm exam will take place on February 28 during class.

Final Exam will be cumulative but will focus on the material covered after the midterm. You are responsible for taking the midterm and final exam on the day they are given.

Course Policies

Grading Policies

Late responses to the weekly review questions will not receive credit, but a missed assignment can be used as the dropped score. If you have a university-accepted reason (e.g. illness with a doctor's note), you may make up the assignments within 7 days of the due date.

In this course, we will be assigning +/- letter grades. Generally, if you receive 93% of the total points for the course this will be an A.

Request for Special Accommodations

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact Professor Weinstein and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to the DRES website.

Please note accommodations are not retroactive to the beginning of the semester but begin the day you contact Professor Weinstein with a current letter of accommodation from DRES.

Academic Integrity

We will follow Articles 1-401 through 1-406 of the *Student Code* (beginning at http://studentcode.illinois.edu/article1_part4_1-401.html). This rule defines infractions of academic integrity, which include but are not limited to cheating, fabrication, and plagiarism. You are responsible for following these guidelines. If you have any questions about whether something would be an infraction, consult with the instructor before proceeding.