ECON 490: Topics in Nonlinear Econometrics

Fall 2021

Course Meeting: Monday, Wednesday 8:00-9:20 AM, Zoom
Credits: 3

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Office Hours: Tuesdays 11 – 12 and Thursdays 2 – 3, Zoom
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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

Topic 1: Introduction to Survival Analysis [August 23]

Chapters 1

Topic 2: Describing the Distribution of Failure Times [August 25, August 30]

Chapter 2

Topic 3: Hazard Models [September 1, September 8]

Chapter 3

Topic 4: Censoring and Truncation [September 13, September 15]

Chapters 4

Topic 5: Recording Survival Data [September 20 (recorded), September 22]

Chapter 5

Topic 6: Organizing and Preparing Data for Survival Analysis [September 27, September 29]

Chapter 6

Midterm [October 4 Review, October 6 Midterm]

Topic 7: Looking at Output and Nonparametric Analysis [October 11, October 13]

Chapter 7 and Chapter 8

Topic 8: Nonparametric Analysis: Survivor Function and Cumulative Hazard [October 18, October 20]

Chapter 8

Topic 9: Nonparametric Analysis: Hazard Function [October 25, October 27]

Chapter 8

Topic 10: The Cox Proportional Hazards Model [November 1, November 3]

Chapter 9

Topic 11: Cox Proportional Hazards Model: Hazard Functions and Additional Covariates [November 8, November 10]

Chapter 9 and Chapter 10

Topic 12: Cox Proportional Hazards Model: Interactions and Time-Varying Variables and Coefficients [November 15, November 17]

Chapter 10

Topic 13: Cox Proportional Hazards Model: Group Effects and Diagnostics [November 29, December 1]

Chapter 10 and Chapter 11

Topic 14: Applications: Unemployment, Banks, and Technology [December 6]

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

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).

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*.

i>clicker

A subscription to i>clicker Reef is required for in-class participation. See below for details on grading policies for i>clicker questions.

You may purchase a six month subscription on the i>clicker website: https://www.iclicker.com/pricing

How to register:
To receive credit for the responses you submit with i>clicker, you must have an i>clicker Reef account, and add this course, by the beginning of the second class, August 25 at 8 AM. Students who register after this time will not receive credit for their participation in the classes before they added this course on their clicker account.

To add this course, follow the instructions on this website: https://macmillan.force.com/iclicker/s/article/Add-Your-Instructor-s-Course-in-Reef

Cheating Policy:
Bringing a fellow student's i>clicker to class and voting for them is cheating and a violation of the University Student Code (http://studentcode.illinois.edu/). If you are caught with a remote other than your own or have votes in a class that you did not attend, you will forfeit all clicker points and may face additional disciplinary action.

Activities and Grades

Grades are determined by the following rubric:

Participation: 10% (lowest dropped)
Lab Assignments: 30% (lowest dropped)
Midterm exam: 30%
Final exam: 30%

Each component is discussed below.

Participation will be based on iclicker responses. These questions will generally be graded for participation and not for accuracy. There will generally be three iclicker questions per 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 October 6 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.

Students enrolling in this course for master's credit will have an empirical final project as an additional component to the course. Details to follow.

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.