Economics 476/576 Implementing Econometrics Using Stata and R Syllabus

EC 476/576
Winter 2021
T/Th 12:00-1:50 pm
CRN: 41007 (EC476)/41019 (EC576)
TA: Chau Nguyen min25@pdx.edu
Classroom: pdx.zoom.us/j/83436627634

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Applied data analysis is probably the most marketable skill of economics graduates. This course provides nuts and bolts techniques for implementing econometric analysis using Stata software, the R statistical package with an introduction to SAS and SQL. Topics implemented in both Stata and R include processing data, graphing techniques, regression diagnostics, nonparametric smoothing, and programming.

This will be an "inverted" course, where most of the class time will be spent solving problems on the computer, and homework time will be for watching video lectures, reading and individual research projects. The course is a good complement to writing a thesis or a major empirical research paper. At the end of this course, you can credibly write on your CV that you know Stata and R well and are conversant in SAS and SQL data extraction.

Recommended prerequisite: an econometrics course or statistics courses including regression analysis.

The main text for the course is ***An Introduction to Modern Econometrics Using Stata*** by Christopher F. Baum (Stata Press: ISBN-13: 978-1-59718-013-9). An optional additional text for those interested in focusing on programming is ***An Introduction to Stata Programming***, also by Christopher F. Baum (Stata Press: ISBN 978-1-59718-045-0).

All other readings are on D2L (d2l.pdx.edu).

You will need a computer that has enough disk space to run Stata and R. If you do not have access to a computer, talk to me. The Stata software can be downloaded from here for Windows, and here for Macs. The Stata licensing codes are on D2L in the Software folder. This license in only valid until the end of March.

There will be short weekly quizzes about the readings for the forthcoming week each Tuesday. Each student will be expected to read all the assigned material, participate in classroom exercises, and complete the take-home assignments.

Students will complete either an empirical research project or create a command in Stata or R.

Grades are determined by

- 15% on weekly quizzes

- 40% on class exercises
- 45% on research paper

Regular attendance is vital since much of the class time is devoted to participatory exercises. All assignments are due in class on the dates announced and will be marked down if late. It's always better to turn in an assignment late than not at all.

Do not plagiarize or **engage in** any other form of **academic dishonesty**. While I encourage you to discuss your assignments with other people, the final product must be your own, containing full citations to any work on which you draw. **I vigorously pursue suspected cheating** because it undermines honest work.

Students with accommodations approved through the Disability Resource Center should tell me during the first week of term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval should contact the DRC immediately.

Portland State University supports equal opportunity for all, regardless of age, color, disability, marital status, national origin, race, religion or creed, sex or gender, sexual or gender identity, sexual orientation, veteran status, or any other basis in law.

I have a responsibility to create a safe learning environment. As a faculty member, I am required to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information about sexual harassment, violence or discrimination with a confidential employee who does not have this reporting responsibility, you can find a list of those individuals. For more information about Title IX please see the student module Creating a Safe Campus in your D2L.

Course Outline and Readings

- Week 1, Class 1&2 (January 5, 7)
    - Introduction to Stata: loading data & manipulating variables.
        - Baum, Chapters 1 & 2
        - Stata Youtube videos:
            - Tour of the Stata 16 interface
            - Import Excel data
            - peruse the titles of Stata data management videos for future reference

- Week 2, Class 3&4 (January 12, 14)
    - project proposal due January 14
    - Creating effective descriptive statistics
        - Baum, Chapter 3
        - Stata Youtube videos:
            - Descriptive statistics
            - Tables and cross tabulations
            - *t* test for two samples
            - merge two datasets

        - Stata manual for summarize, tabulate oneway, by, tabulate, summarize(), table, ttest

- Week 3, Class 5&6 (January 19, 21)
    - Graphics
        - Stata Youtube videos:
            - Bar graphs
            - Histograms
            - Basic scatterplots
        - Stata manual for twoway line (*read carefully*)
    - Nonparametric smoothing
        - Stata manual for kdensity, npregress intro.

- Week 4, Class 7&8 (January 26, 28)
    - Stata programming
        - Baum, Appendix B
        - Stata manual for syntax
        - Stata User Guide Chapter 18: Programming Stata

- Week 5, Class 9&10 (February 2, 4)
    - Regression and diagnostics
        - Baum, Chapter 5 and 7.1-7.2
        - Stata Youtube video:
            - Simple linear regression in Stata

- Week 6, Class 11&12 (February 9, 11)
    - Regression with indicator variables
    - Baum, Chapters 7
    - Stata Youtube videos:
        - Factor Variables 1, 2, 3
    - Instrumental variables
        - Stata Youtube: instrumental variables
        - *Master of Economics students only*: Baum, Chapter 8

- Week 7, Class 13&14 (February 16, 18)
    - literature review due February 16
    - R basics & descriptive statistics
        - Getting Started in R~Stata from Oscar Torres of Princeton DSS (start reading on page 13, then read pages 6,7,10,11 at the end)
        - Intro to R videos from Google Developers (watch sections 1-3, not 4)

- Week 8, Class 15&16 (February 23, 25)
    - R graphics
        - Youtube videos:
            - Graphics 1, 2, 3

- Week 9, Class 17&18 (March 2, 4)
    - R regression and diagnostics
        - Linear Models from Germán Rodríguez, Introducing R
        - quick reference (*not* assigned reading): Farnsworth, Econometrics in R

- Week 10, Class 19&20 (March 9, 11)
    - final paper due March 16
    - SAS
        - Comparing SAS and Stata side by side (on D2L under Lectures tab)
    - SQL and RDBMs
        - "Relational databases" in R Data Import/Export (read only 4.1 – 4.3.1)

Readings

Baum, Christopher F. 2006. An Introduction to Modern Econometrics Using Stata. College Station, Texas: Stata Press. ISBN 978-1-59718-013-9.

Baum, Christopher F. 2009. An Introduction to Stata Programming. College Station, Texas: Stata Press. ISBN 978-1-59718-045-0. (optional)