Evans School of Public Policy and Governance  
PB AF 528 C  
Spring 2016  
Professor Jacob Vigdor

Quantitative Analysis II  
With a special application to income inequality and disparities

Rationale

Statistical evidence figures prominently in many policy debates. The purpose of this course is to empower students to discern whether arguments based on this type of evidence are convincing. In many cases, statistically-based arguments are accepted uncritically ("numbers don't lie") or dismissed as untrustworthy ("lies, damned lies, and statistics"). A sophisticated skeptic knows the right questions to ask about a statistical analysis in order to support an informed judgment regarding its validity and relevance to policy debates. By the end of the quarter, my goal is for each student in this course to qualify as a sophisticated skeptic, and in particular one who possesses the technical skills necessary to produce convincing evidence, not just consume it.

Courses of this type often use silly, meaningless datasets to illustrate concepts (e.g., data on how many defective light bulbs there are in a box). In this course, my lectures and your assignments will make use of data on actual American families, with analysis focused around the general theme of income inequality and discrimination in the American labor market.

As instructor, my goal is to make you glad you took this course all the days from June 8, 2016 to the end of your career.

Personnel

Jacob L. Vigdor  
324 Parrington Hall  
(206)616-4436  
jvigdor@uw.edu

Instructor:

Office Hours for Spring: by appointment.

Alicia Ahn  
412 Parrington Hall  
Teaching Assistant: yeahn@uw.edu

Office Hours for Spring: Tuesdays 3-5 PM in PAR 124D or by appointment.

Class meetings

Lectures Wednesday, 5:30-8:20 PM, Parrington 108
Course materials

There is one "recommended" textbook for the course:


In addition, if you peruse the readings selected for each class (just click on the entries in the calendar list below) you'll see that many topics are also covered in the Newbold, Carlson and Thorne textbook (*Statistics for Business and Economics*, 7th ed., Pearson) adopted in PB AF 527. Certain more advanced topics are covered in Studenmund but not in NCT.

So should you by Studenmund? I'd suggest the following strategy. Try getting by without it for the first couple of weeks of the course. If you find that lectures plus the occasional reference to NCT is enough to get you through the problem sets and leave you without the sinking feeling that your understanding is falling behind, then you may not need Studenmund. If you are the type of student who likes to see topics covered from multiple perspectives, you may want to plunk down the money to invest in the book.

Toward the end of the quarter we will read selections from Shadish, Cook and Campbell (*Experimental and Quasi-Experimental Designs for Generalized Causal Inference*, Houghton Mifflin). You don't need to buy this book, but if you are a fan of the non-technical approach they take and think you kind of like this data analysis stuff I do recommend it for your professional shelf.

This course will make use of the statistical software package Stata. It is available for UW student use on CSDE servers. You may acquire a personal copy on either a 6-month basis for $69 or in perpetuity for $189 here (Links to an external site.).

Assignments and Grading

Your grade in this course will be based on five problem sets, three assessment memos, a midterm, and a final. The course is designed to have a fairly steady workload over the course of the quarter, with assignments due almost every week but never more than once a week. Assignment prompts and problem sets will be posted on Canvas and you will submit your work on Canvas. The Canvas calendar for this course will keep you up to date on what is due when. Due dates are binding except in cases where students request an extension prior to the deadline.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight in final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment memos (3)</td>
<td>25% (8.3% each)</td>
</tr>
<tr>
<td>Problem sets (5)</td>
<td>25% (5% each)</td>
</tr>
<tr>
<td>Midterm exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Lecture 1: Single Variables
Mar 30, 5:30pm - 6:50pm
**Calendar**  PB AF 528 C: Quantitative Analysis II  
**Location**  Parrington 108  
**Details**  de Maio, Fernando G. (2007) "Income Inequality Measures (Links to an external site.)"  *Journal of Epidemiology and Community Health* v.61 pp.849-852.  
Review basic concepts: variance, standard deviation, mean, median: see Studenmund Chapter 16, Newbold, Carlson and Thorne chapters 2.1, 2.2 or related sources.

**Lecture 2: Correlation and the statistics of two variables**
Mar 30, 7:00pm - 8:20pm  
**Calendar**  PB AF 528 C: Quantitative Analysis II  
**Location**  Parrington 108  
**Details**  Review materials on two-sample t-tests, chi-squared tests, and correlation.  See, for example Newbold, Carlson and Thorne 10.1, 10.3, 11.7.

**Section 1: Introduction to Stata (PB AF 528 CB)**
Apr 1, 11:30am - 12:20pm  
**Calendar**  PB AF 528 C: Quantitative Analysis II  
**Location**  Parrington 108

**Lecture 3: All about lines**
Apr 6, 5:30pm - 6:50pm  
**Calendar**  PB AF 528 C: Quantitative Analysis II  
**Location**  Parrington 108  
**Details**  Newbold, Carlson, and Thorne 11.1, 11.2; Studenmund Chapter 1

**Lecture 4: The nuts and bolts of OLS regression**
Apr 6, 7:00pm - 8:20pm  
**Calendar**  PB AF 528 C: Quantitative Analysis II  
**Location**  Parrington 108  
**Details**  Newbold, Carlson and Thorne 11.3; Studenmund 2.1

**Section 2: Regression in Stata (PB AF 528 CB)**
Apr 8, 11:30am - 12:20pm  
**Calendar**  PB AF 528 C: Quantitative Analysis II  
**Location**  Parrington 108

**Lecture 5: From Univariate to Multivariate Regression**
Apr 13, 5:30pm - 6:50pm
Lecture 6: How to figure out if a regression makes sense
Apr 13, 7:00pm - 8:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Newbold, Carlson and Thorne 11.4, 12.3; Studenmund 2.3-2.5, 3.1

Section 3: Multivariate regression in Stata (PB AF 528 CB)
Apr 15, 11:30am - 12:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Details Newbold, Carlson and Thorne 11.5, 12.4, 12.5; Studenmund 5.1-5.5 if you need a review; Studenmund 5.6 (F-test appendix) for sure.

Lecture 7: Confidence intervals and hypothesis tests in regression
Apr 20, 5:30pm - 6:50pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Newbold, Carlson, and Thorne 11.6, 12.6; Studenmund 15.1, 15.2

Lecture 8: Using regressions for prediction
Apr 20, 7:00pm - 8:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Newbold, Carlson, and Thorne 12.7; Studenmund 7.2

Section 4: Post-estimation commands in Stata (PB AF 528 CB)
Apr 22, 11:30am - 12:20pm
Calendar  PB AF 528 C: Quantitative Analysis II

Lecture 9: Fitting complicated shapes to data
Apr 27, 5:30pm - 6:50pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Newbold, Carlson and Thorne 12.7; Studenmund 7.2
Lecture 10: Adding qualitative data to the right hand side
Apr 27, 7:00pm - 8:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location  Parrington 108
Details  Newbold, Carlson and Thorne 12.8, Studenmund 7.4

Midterm review session (PB AF 528 CB)
Apr 29, 11:30am - 12:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
PB AF 528 CB
Location  Parrington 108

In-class midterm
May 4, 5:30pm - 6:50pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location  Parrington 108

Lecture 11: Assumptions underlying OLS
May 4, 7:00pm - 8:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location  Parrington 108
Details  Studenmund 4

Midterm debriefing (PB AF 528 CB)
May 6, 11:30am - 12:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
PB AF 528 CB
Location  Parrington 108

Lecture 12: When regressions go bad (heteroskedasticity and multicollinearity)
May 11, 5:30pm - 6:50pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location  Parrington 108
Details  Newbold, Carlson and Thorne 13.5, 13.6; Studenmund 8, 10
Lecture 13: Qualitative data on the left hand side (probit and logit models)
May 11, 7:00pm - 8:20pm
Calendar PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Studenmund 13

Section 5: Probits, Logits, and Weights (PB AF 528 CB)
May 13, 11:30am - 12:20pm
Calendar PB AF 528 C: Quantitative Analysis II
PB AF 528 CB

Lecture 14: Correlation is not causality... so what IS causality?
May 18, 5:30pm - 6:50pm
Calendar PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Shadish, Cook and Campbell Chapter 1; Chapter 2 pp.53-63; Chapter 3 pp.64-93.

Lecture 15: Randomized trials
May 18, 7:00pm - 8:20pm
Calendar PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Shadish, Cook and Campbell Chapter 8.


Section 6: Causal methods in Stata (PB AF 528 CB)
May 20, 11:30am - 12:20pm
Calendar PB AF 528 C: Quantitative Analysis II
PB AF 528 CB

Lecture 16: Natural Experiments
May 25, 5:30pm - 6:50pm
Calendar PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details Shadish, Cook and Campbell Chapters 4 and 5.

Lecture 17: Instrumental Variables
May 25, 7:00pm - 8:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details  Sovey, Allison J. and Donald P. Green (2011) "Instrumental Variables Estimation in Political Science: A Readers' Guide. (Links to an external site.)" American Journal of Political Science v.55 pp.188-200.
Hoxby, Caroline (2000) "Does Competition among Public Schools Benefit Students and Taxpayers? (Links to an external site.)" American Economic Review v.90 pp.1209-1238.
Rothstein, Jesse (2007) "Does Competition among Public Schools Benefit Students and Taxpayers: Comment. (Links to an external site.)" American Economic Review v.97 pp.2026-2037.

Optional discussion of validity & assessments (PB AF 528 CB)
May 27, 11:30am - 12:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
PB AF 528 CB

Lecture 18: Regression Discontinuity
Jun 1, 5:30pm - 6:50pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108
Details  Shadish, Cook and Campbell Chapter 7.

Wrapping up
Jun 1, 7:00pm - 8:20pm
Calendar  PB AF 528 C: Quantitative Analysis II
Location Parrington 108