PPM 512 Data Analysis Dr. Pirog’s Office Hours: open

Professor Maureen Pirog Dr. Pirog’s phone: 812-360-0232

Class Time: Tuesdays 1:30-4:00 (feel free to call)

Class Meeting Location: Parrington Hall—Steve Smith’s office or my office as back-up!

**Course Objective:**

The goal of this course is to gain greater understanding of new analytical approaches to data analysis as well as solidify your existing knowledge by analyzing data from a wide variety of sources.

**Class Books:**

Richard J. Murnane and John B. Willett. 2011. *Methods Matter: Improving Causal Inference in Education and Social Science Research*. (Oxford University Press: Oxford, England).

A. Colin Cameron and Pravin K. Trivedi. 2010. *Microeconometrics Using Stata*. (Stata Corp LP: College Station, TX). This is a reference text that you should have if you are using Stata and not a class readings textbook.

I will assign additional readings from other sources throughout the course.

**Examples with Data and Computer Coding from Methods Matter**

Go to <http://www.ats.ucla.edu/stat/stata/examples/methods_matter/default.htm>.

At this site you can download the data which is listed by Chapter in Methods\_Matter as well as the computer code that generated the results. The code is available in both Stata and SAS.

**Class Evaluation:**

Grades will be assigned based on the following distributions.

Class participation/preparedness: 35 percent

Weekly homework assignments: 35 percent

Individual or group class paper: 30 percent

**Locating Data for Class Assignments:**

Normally I will choose a data set for you to use and allow you the option of using an alternative data set. If you are really smart, you will take the time to use the alternative data set simply because you can get your hands dirty using data that actually interests you. However, either option is perfectly acceptable. Heck out the data archives at University of Michigan, AER and other economics journals, the Census and DOL websites, IES, among many others. Do not try to access proprietary geo-coded data as the IRB protocols will take far too long for class purposes.

**Class Schedule:**

**January 3: Introduction**

Murnane and Willett: Chapter 1-5: The Challenge for Educational Research, The Importance of Theory, Designing Research to Address Causal Questions, Investigator-Designed Randomized Experiments, and Challenges in Designing, Implementing, and Learning from Randomized Experiments.

**January 10: Statistical Power**

Murnane and Willett: Chapters 6: Statistical Power and Sample Size.

**January 17: Randomizing Clusters or Groups**

Murnane and Willett: Chapter7: Experimental Research When Participants Are Clustered Within Intact Groups.

Howard Bloom. 2005. *Learning More from Social Experiments: Evolving Analytic Approaches* (Sage: NY), Chapter 2: Modeling Cross-Site Experimental Differences to Find Out Why Program Effectiveness Varies.

Howard Bloom. 2005. Learning More from Social Experiments: Evolving Analytic Approaches (Sage, NY), Chapter 4: Randomizing Groups to Evaluate Place-Based Programs.

Assignment #1: Download the data and computer code to replicate the results in Chapter 7 of Methods\_Matter. Replicate the results and bring output to class. You may choose to do a similar project with data of your choice (plus 1 course point).

**January 24: Natural Experiments**

Murnane and Willett: Chapter 8: Using Natural Experiments to Provide “Arguably Exogeneous” Treatment Variability.

Rene Aubourg, David Good and Kerry Krutilla. 2007. Debt, Democratization and Development in Latin America – How Policy Can Affect Global Warming. JPAM 27(1), 7-19.

Silvie Colman and Ted Joyce. 2011. Regulating Abortion: Impact on Patients and Providers in Texas in JPAM 30(4): 775-797.

Assignment #2: Download the data and computer code to replicate the results in Chapter 8 of Methods\_Matter. Replicate the results and bring output to class. You may choose to do a similar project with data of your choice (plus 1 course point).

**January 31: Regression-Discontinuity Designs**

Murnane and Willett: Chapter 9: Estimating Causal Effects Using a Regression Discontinuity Approach.

Sunny Xinchun Niu and Marta Tienda. 2009. The Impact of the Texas Top 10 Percent Law on College Enrollment: A Regression Discontinuity Approach. JPAM 29(1): 84-110.

Assignment #3: Download the data and computer code to replicate the results in Chapter 9 of Methods\_Matter. Replicate the results and bring output to class. You may choose to do a similar project with data of your choice (plus 1 course point).

**February 7: Instrumental Variables**

Murnane and Willett: Chapter 10: Introducing Instrumental Variables Estimation.

Lisa A. Gennetian, Pamela A. Morris, Johannes M. Bos and Howard Bloom. “Constructing Instrumental Variables from Experimental Data to Explore How Treatments Produce Effects,” pages 75-114 in *Learning More from Social Experiments*, Bloom, ed. Chapter 3.

Assignment #4: Download the data and computer code to replicate the results in Chapter 10 of Methods\_Matter. Replicate the results and bring output to class. You may choose to do a similar project with data of your choice (plus 1 course point).

**February 14: More Instrumental Variables**

Murnane and Willett: Chapter 11: Using IVE to Recover the Treatment Effect in a Quasi-Experiment.

Assignment #5: Download the data and computer code to replicate the results in Chapter 11 of Methods\_Matter. Replicate the results and bring output to class. You may choose to do a similar project with data of your choice (plus 1 course point).

**February 21: Dealing with Bias in Nonexperimental Studies**

Murnane and Willett: Chapter 12: Dealing with Bias in Treatment Effects Estimated from Nonexperimental Data.

Howard Bloom. 2005. *Learning More from Social Experiments: Evolving Analytic Approaches* (Sage: NY), Chapter 5: Using Experiments to Assess Nonexperimental Comparison-Group Methods for Measuring Program Effects.

Assignment #6: Pick any paper that uses PSM or any other method to deal with selection bias other than IV using data outside Methods\_Matter and replicate the findings of the author. Bring the output to class and be prepared to discuss.

**February 28: Dealing with Bias in Nonexperimental Studies (Continued)**

Murnane and Willett: Chapter 12 (Continued): Dealing with Bias in Treatment Effects Estimated from Nonexperimental Data

Assignment #7: Download the data and computer code to replicate the results in Chapter 12 of Methods\_Matter. Replicate the results and bring output to class. You may choose to do a similar project with data of your choice (plus 2 course points). Note: The code for this module is only in STATA.

**March 6: Wrap Up**

Murnane and Willett: Chapters 13-14: Methodological Lessons from the Long Quest and Substantive Lessons and New Questions

**Individual or group project:**

You may choose to tackle the course project individually or in a group.

The individual project consists of selecting an article (with published data or publically available data) in any topic area of your choosing. First, replicate the results of the authors. Second, improve their model. Third, write a report describing the original model and your improvements and justify your better methods.

The group project is still ……..in progress.