ECON672
PROGRAM ANALYSIS AND EVALUATION

University of Maryland – Master of Science in Applied Economics Program
Summer 2021

Syllabus
Professor Tomas Monarrez
Email: monarrez@umd.edu

Synchronous Online Course Meeting: We will meet on Wednesdays, between and 6:45-9:15pm. There will be a 30-45 minute break halfway through the synchronous meeting.

Main Communication: Email and Zoom.

Office Hours: Thursdays 5:15pm-6:00pm on Zoom. Please email me if you are planning to attend office hours.

Course Pre-requisites: ECON 641; ECON 645 is a co- or prerequisite.

TA Information: Scott Abramson (jsabram@umd.edu). Office hours: TBA on Zoom.

Key Dates: The final exam will be on Wednesday August 18th.

Course description
The primary objective of this course is to learn the tools that are used to evaluate the effectiveness of public policies. We will cover on both experimental and non-experimental methods, with a larger focus on the latter, and you will learn how to distinguish high from low quality evaluations in both contexts. We will discuss the economics and econometrics of program evaluation, focusing on the methods used for causal inference. We will examine published evaluation research with the intent of showing how research does or does not lead to clear conclusions regarding program performance.

Course objectives
Our program has 7 general learning outcomes for students:

1. **Ability to understand, evaluate and analyze economic data**
2. **Ability to understand and interpret statistical evidence from economic data**
3. **Ability to apply empirical evidence to assessing economic arguments**
4. Ability to apply macroeconomic theories to policy discussions
5. **Ability to apply microeconomic theories to policy discussions**
6. **Ability to communicate economic ideas to a broader audience**
7. **Ability to evaluate the effectiveness of policy programs using sound economic techniques**

The learning outcomes that pertain to this course are: *1, 2, 3, 5, 6, 7*

In the specific context of this course, students will:

- Learn the basics of the economics and econometrics of program evaluation, with a focus on

hands-on implementation of econometric methods using actual data
- Critically review the evaluation literature via written comments, formal discussant presentations, and general class discussion of published evaluation research with the aim of showing how the process of knowledge creation through research does or does not lead to clear conclusions regarding program effects
- Critically evaluate how research is presented in the public domain (e.g., media) to be a better consumer of reported findings
- Learn the basics of how the evaluation industry functions and how evaluations affect and are affected by policy

Course materials

Official text: Angrist, Joshua and Jorn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton. This is the only required text for this class.

You will also be responsible for all of the journal articles that are listed in the syllabus accompanying lecture. These can be accessed through the library. Please read the assigned articles prior to class in order to facilitate in-person discussion during class. If you need help obtaining electronic access to articles, the TA can provide assistance.

Related books you may find useful, but are not required:

This book is similar to but less technical than our official text.

Angrist, Joshua and Jorn-Steffen Pischke. 2015. *Mastering 'Metrics*. Princeton University Press.

The following book is pretty standard in evaluation courses taught outside of economics. You may find it of interest. It provides a broader analysis of the evaluation field than will be apparent from this course, which focuses specifically on estimating policy impacts using large datasets and econometric methods.

Rossi, Peter, Mark Lipsey, and Howard Freeman. 2003. *Evaluation: A Systematic Approach*. 7th Edition. Sage.

The following provides good background on basic regression. Any edition will do as the material does not change much over time. I assume that you come into this course with a basic understanding of the main principles of this book taught in the pre-requisite econometrics courses of this program.

Wooldridge, Jeffrey. *Introduction to Econometrics: A Modern Approach*. (Any edition).

Required software: Stata.

Purchasing Stata: Our program's curriculum is designed to use Stata as the statistical software. Other leading statistical software packages include R and Python. We have decided to focus on one package to enhance the continuity across courses in our program. A more superficial familiarity with multiple packages might be just as good as a deep understanding of a single package. But working with multiple packages would also result in less time to learn econometrics.

Students in our program must purchase Stata. Stata offers different "flavors" and different lengths of licensing. Price varies according to these two factors. We do not recommend Small

Stata since it is too limited for the coursework in our program. Stata/IC is the least expensive and sufficient version for your coursework. With a single-user license, you can install Stata on up to three computers. Description of all the flavors are given here.

You can buy either an annual ($125 for Stata/IC) or a perpetual license ($198 for Stata/IC.) The perpetual license does not expire and is the most cost effective option assuming that you will stay in the program for at least 15 months. There are also upgrade discounts provided to perpetual license holders. During the checkout process you will be asked to verify your "@umd.edu" email address.

If you wish to buy a 6-month license ($75 for Stata/IC), you need to order it as a regular student here. During the checkout process you will be asked to upload a copy of your student ID or another document as a proof of your enrollment.

Grading and assignments (% of grade)
Online discussions: due weekly, Tuesdays at 5 pm (15% total)
Problem sets: due June 30 and August 4 (10% each)
Written memo: due July 21 (10%)
Course presentation: TBD (10%)
Midterm exam: July 7 (20%)
Final exam: August 18 (25%)

Online discussions: I will post a question or series of questions relevant to the course material every Monday. Discussions may also be related to the topics addressed during student presentations, detailed below. The discussion will be open until Tuesday at 5pm for you to comment/respond. Please contribute two quality comments a week, of which at least one should be a reply or a response to a classmate's post. Online discussions will take place every week when there's a class meeting. The TA and I will check in to participate/respond/redirect.

Problem sets: During class, we will frequently work through program evaluation problems in Stata. Organized along similar lines, two assigned problem sets will give you independent practice working through the basic econometric evaluation estimators and how they are implemented in Stata using real data. You will be asked to estimate econometric models and interpret the results. It is expected that you have a basic understanding of Stata from your previous econometrics courses, and that you are able to utilize Stata help files to learn new code. Your grade will depend both on whether you estimate what you are asked to estimate correctly and how well you interpret the results. Both of these are valuable skills.

You may work together on the problem set, but each student must turn in his or her own version of the assignment. The problem set and the written memos will be submitted via ELMS using the "Submit Assignment" button on the relevant assignment's page and uploading the required file(s). Please contact the TA via email if you encounter any problems. The problem set will include exercises using Stata as well as short-answer questions. For the problem set, you should turn in a well-organized and well-commented Stata log file. Please type your responses to the short-answer questions as comments in your do-file, so that they are displayed in your log file.

The following books provide useful references for Stata. However, it is entirely possible to learn

the necessary Stata code on one's own with resources available online.

Mitchell, Michael N. 2010. *Data Management Using Stata: A Practical Handbook*, Stata Press.

Acock, Alan. 2008. *A Gentle Introduction to Stata, 2nd Edition*. College Station: Stata Press.

Written memo: Every day, findings from studies and evaluations are reported in popular press. In an attempt to generate headlines, the press often turns to evaluations based on very weak research designs. The objective of this assignment is to challenge you to be a critical consumer of research findings. It is healthy to approach articles as though the basic claims being stated are wrong, and to think of ways to debunk the claims being made. The assignment asks you to write a two page memo assessing the findings of a recent program evaluation study. This should consist of a concise summary and critique of a study reported on in popular press (e.g., New York Times, Washington Post, or the Wall Street Journal). This critique should be based solely on the description in the article, not on the original research. Assume that you work for the Secretary of a branch of government under whose purview this program or policy would fall. For example, if you select an article on tax policy, you would be writing a memo for Treasury Secretary Steve Mnuchin. The memo should have four sections: objective of the study, design of the study, findings from the study, and critique. The first three sections should be very short (half a page to a page). The majority of the memo should focus on the weaknesses of the study. A copy of the article must be also be submitted with the memo. Note that, while your critique should only be based on the news article's description, you must choose a news article that offers sufficient opportunity to describe and critique a study *using concepts taught in this course*.

Course presentation: You will formally discuss a small number of papers. There will be **two** formal discussants per paper. The formal discussant remarks should resemble those at academic conferences. Discussant remarks should last about 15 minutes per group. Following the formal discussant remarks, there will be a question and answer/discussion of the remarks and paper in our online discussion forum (see above). It is advisable that you start preparing for the formal discussant remarks well in advance, in case you have questions about the economics or the econometrics of the paper you are assigned to discuss. Practicing your formal discussant remarks is also a good idea. The papers for presentation, along with group assignments, will be announced later. In addition, groups will have the option to record a video presentation or to present during our synchronous meeting. To retain this flexibility, groups must notify me at least 2 weeks ahead of time on what your preference is on this matter.

Calculation of final grades: The problem sets and exams will each be scored then translated to a 100-point scale. The memo and course presentation will be scored out of 10 points, then translated to a 100-point scale. Each discussion session will be graded on a 5 point scale. The discussion grade will be computed as a sum of your discussion grades over the course, then translated to a 100-point scale. Your final grade will be calculated by taking a weighted sum of these grades, where weights on each assignment are provided above. Final grades will be assigned under the following scale:

	80-89 B+	50-59 C+	20-29 D+
93-100 A	70-79 B	40-49 C	10-19 D
90-92 A-	60-69 B-	30-39 C-	0-9 F

Course Schedule

1. **June 2: Introduction to Causality and Empirical Strategies in Economics**

   Angrist and Pischke, Chapters 1 through 3.1

   Recommended:

   Angrist, Joshua, and Jorn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con Out of Econometrics." *Journal of Economic Perspectives* 24(2): 3–30.

2. **June 9: Regression review, Experimental design; Data Preparation**

   Angrist and Pischke, Chapter 3.2

   Gentzkow, Matthew, and Jesse M. Shapiro (2014) "Code and Data for the Social Sciences: A Practitioner's Guide." University of Chicago mimeo.
   https://web.stanford.edu/~gentzkow/research/CodeAndData.pdf

   Chetty, Raj, Nathaniel Hendren, and Lawrence Katz (2016). "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Project," *American Economic Review* 106 (4): 855-902.

   Recommended:

   Katz, Lawrence F., Jeffrey R. Kling, and Jeffrey B. Liebman (2001). "Moving to Opportunity in Boston: Early Results of a Randomized Mobility Experiment," *Quarterly Journal of Economics* (May): 607-654.

   Schultz, T. Paul, "School Subsidies for the Poor: Evaluating the Mexican PROGRESA Poverty Program," Journal of Development Economics 74 (2004), 199–250.

   Duflo, Esther, Rachel Glennerster, and Michael Kremer (2007) "Using Randomization in Development Economics Research: A Toolkit"

   Banerjee, Abhijit, Rukmini Banerji, James Berry, Esther Duflo, Harini Kannan, Shobhini Mukerji, Marc Shotland, and Michael Walton (2017). "From Proof of Concept to Scalable Policies: Challenges and Solutions, with an Application" *Journal of Economic Perspectives* 31(4): 73-102, Symposium: From Experiments to Economic Policy.

3. **June 16: Experimental design, additional topics; Intro to quasi-experimental design;**

   Miguel, Edward, and Michael Kremer. 2004. "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." *Econometrica* 72 (1): 159-217.

   LaLonde, Robert J, 1986. "Evaluating the Econometric Evaluations of Training Programs with Experimental Data," American Economic Review, American Economic Association,

vol. 76(4), pages 604-620, September.

Card, David (1990). "The Impact of the Mariel Boatlift on the Miami Labor Market," *Industrial and Labor Relations Review* 43: 245-57.

Recommended:

David Card & Gordon B. Dahl, 2011."Family Violence and Football: The Effect of Unexpected Emotional Cues on Violent Behavior," The Quarterly Journal of Economics, Oxford University Press, vol. 126(1), pages 103-143.

4. **June 23: Selection on Observables; Propensity Score Matching**

Angrist and Pischke, Chapter 3, section 3.3 to the end of the chapter

Dehejia, Rajeev and Sadek Wahba (1999). "Causal Effects in Nonexperimental Studies: Reevaluating the Evaluation of Training Programs," Journal of the American Statistical Association 94, no. 448: 1053-62.

Recommended:

Dinardo, John; Nicole M. Fortin, and Thomas Lemieux (1996) "Labor Market Institutions and the Distribution of Wages". Econometrica. Vol. 64 No. 5:1001-1044.

5. **June 30: Decomposition Methods; Group Effects and Value-Added Models**

Problem Set 1 due at the beginning of class

Oaxaca, Ronald, 1973. "Male-Female Wage Differentials in Urban Labor Markets," International Economic Review, Department of Economics, University of Pennsylvania and Osaka University Institute of Social and Economic Research Association, vol. 14(3), pages 693-709, October.

Chetty, Raj, & John N. Friedman & Jonah E. Rockoff, 2014. "Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates," American Economic Review, American Economic Association, vol. 104(9), pages 2593-2632, September.

Rothstein, Jesse, 2017. "Measuring the Impacts of Teachers: Comment," American Economic Review, American Economic Association, vol. 107(6), pages 1656-1684, June.

Recommended:

Raj Chetty & John N. Friedman & Jonah E. Rockoff, 2014. "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood," American Economic Review, American Economic Association, vol. 104(9), pages 2633-2679, September.

Jesse Rothstein, 2010. "Teacher Quality in Educational Production: Tracking, Decay, and Student Achievement," The Quarterly Journal of Economics, Oxford University Press, vol. 125(1), pages 175-214.

Should probably explicitly note that there will be no meeting on Tuesday 12/29.

6. **July 7: MIDTERM EXAMINATION.**

7. **July 14: Panel Data, Fixed Effects, and Difference-in-Differences design. Course presentations.**

Angrist and Pischke, Chapter 5

Card, David and Alan Krueger (1994). "Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania." *American Economic Review* 84 (4): 772-93. [Link]

Jacobson, Louis S & LaLonde, Robert J & Sullivan, Daniel G, 1993. "Earnings Losses of Displaced Workers," American Economic Review, American Economic Association, vol. 83(4), pages 685-709, September.

8. **July 21: Instrumental Variables, Course Presentations**

Memo due at the beginning of class

Angrist and Pischke, Chapter 4

Joshua D. Angrist & Alan B. Krueger, 1991. "Does Compulsory School Attendance Affect Schooling and Earnings?," The Quarterly Journal of Economics, Oxford University Press, vol. 106(4), pages 979-1014.

Anna Aizer & Joseph J. Doyle, 2015. "Juvenile Incarceration, Human Capital, and Future Crime: Evidence from Randomly Assigned Judges," The Quarterly Journal of Economics, Oxford University Press, vol. 130(2), pages 759-803.

9. **July 28: Regression discontinuity; Course presentations**

Angrist and Pischke, Chapter 6

Damon Clark & Paco Martorell, 2014. "The Signaling Value of a High School Diploma," Journal of Political Economy, University of Chicago Press, vol. 122(2), pages 282-318.

David S. Lee & Thomas Lemieux, 2010. "Regression Discontinuity Designs in Economics," Journal of Economic Literature, American Economic Association, vol. 48(2), pages 281-355, June.

Recommended:

David S. Lee & Enrico Moretti & Matthew J. Butler, 2004. "Do Voters Affect or Elect Policies? Evidence from the U. S. House," The Quarterly Journal of Economics, Oxford University Press, vol. 119(3), pages 807-859.

Stephanie Riegg Cellini & Fernando Ferreira & Jesse Rothstein, 2010. "The Value of School

Facility Investments: Evidence from a Dynamic Regression Discontinuity Design," The Quarterly Journal of Economics, Oxford University Press, vol. 125(1), pages 215-261.

10. August 4: Synthetic Control Methods; Course presentations

Problem Set 2 due at the beginning of class

Abadie, Alberto & Diamond, Alexis & Hainmueller, Jens, 2010. "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program," Journal of the American Statistical Association, American Statistical Association, vol. 105(490), pages 493-505.

Recommended:

McClelland, Robert and Sarah Gault, 2017. "The Synthetic Control Method as a Tool to Understand State Policy". Urban Institute Report. Washington, DC.

11. August 11: Cost Benefit Analysis and Causal Inference; Review; Course presentations

Patrick Kline & Christopher R. Walters, 2016. "Evaluating Public Programs with Close Substitutes: The Case of HeadStart," The Quarterly Journal of Economics, Oxford University Press, vol. 131(4), pages 1795-1848.

Hendren, Nathaniel, and Ben Sprung-Keyser. "A unified welfare analysis of government policies." *The Quarterly Journal of Economics* 135.3 (2020): 1209-1318.

Recommended:

Athey, Susan and Guido W. Imbens (2017). "The State of Applied Econometrics: Causality and Policy Evaluation." *Journal of Economic Perspectives* 31(2): 3-32.

Smith, Jeffrey and Arthur Sweetman. (2010). "Putting the Evidence in Evidence-Based Policy" in *Strengthening Evidence Based Policy in the Australian Federation*, Vol. 1: Proceedings, edited by Productivity Commission. Canberra: Productivity Commission, 59-102.

12. August 18: FINAL EXAMINATION

Standard Policies for the Program and the University of Maryland

Course Website: Copies of the course syllabus, your grades, and other relevant links and documents will be posted on the course's ELMS/Canvas website. You can access the site via www.elms.umd.edu. You will need to use your University of Maryland "directory ID" and password.

Email: The University has adopted email as the primary means of communication outside the classroom, and I will use it to inform you of important announcements. Students are responsible for updating their current email address via http://www.registrar.umd.edu/current/ (Under the first major heading of "Online Transactions" there is a link to "Update Contact Information".)

Contact Hours: Three credit master's-level courses at the University of Maryland require a minimum amount of contact between instructors and students. Our courses' 12 weekly meetings only satisfy 80% of the university's contact requirement. The other 20% is satisfied by weekly mandatory and graded online contact. In principle, the contact hours requirement could be satisfied by scheduling 3 additional 150-minute meetings per term, or 6 additional 75-minute meetings, or 10 additional 45-minute meetings. But in practice the contact hours requirement is satisfied by the weekly online discussions. The weekly online discussions are a more flexible way to ensure that our program's courses in DC provide the same level of student-instructor contact as the traditional 15-week face-to-face version of the same course when it is taught on campus in College Park.

Work Load: Mastering the material covered in this course requires a significant amount of work outside of class. Students should expect to spend more time outside of class than in class – typically at least twice as much time. The courses in our DC program are 12-week courses that cover all the same material as a traditional semester-long 3-credit course (15 weeks). The compressed schedule makes it possible to complete our degree in just 15 months if you take 2 courses each term. But the compressed schedule also implies an accelerated pace with an average of 25% more work per week in a given course (15/12 = 1.25). The normal full-time load in a master's program is 3 courses per semester, or 6 courses per year. The weekly work load when taking 2 of our DC courses per term is equivalent to the load from 2.5 "normal" 15-week courses – so 2.5/3.0=83% of a full-time load. Students who take 2 courses per quarter in our program complete 8 courses per year. So over the course of a year, taking 2 courses per quarter in our DC program is equivalent to 133% of a full-time load (8/6 = 1.33).

Academic Integrity: The University of Maryland has a nationally recognized Code of Academic Integrity. You should inform yourself about the UMD policies related to academic misconduct:
https://www.studentconduct.umd.edu/home/current-students
Cases of academic misconduct, including plagiarism and giving or receiving unauthorized assistance on exams, will be referred to the UMD Office of Student Conduct. If found responsible for academic misconduct, students can be subject to sanctions. The standard sanction for graduate students found responsible for cheating on exams is expulsion from the university.

The exams in this course will ask students to affirm the UMD Honor Pledge: "I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination."

Student Conduct: Students are expected to treat each other with respect. Disruptive behavior of any kind will not be tolerated. Students who are unable to show civility to one another or myself will be referred to the Office of Student Conduct. You are expected to adhere to the Code of Student Conduct.

Excused Absences: The University of Maryland's policy on excused absences is posted here:
http://www.president.umd.edu/administration/policies/section-v-student-affairs/v-100g

Please note:
    If you miss any class meetings for any reason, you are still responsible for all material covered during the meeting you missed. It is your responsibility – not the instructor's – to get yourself caught up in the course.

Instructors routinely facilitate things by posting lecture notes, etc.

   If you need to miss an exam or other graded course requirement because of illness, injury, or some other emergency: Follow doctor's orders and get documentation. Get in touch with the instructor as soon as you're able – preferably prior to missing the exam or deadline. Communicate with the instructor to make up the course requirement as soon as possible. You are entitled to recover before you make up the course requirement, but you are not entitled to extra days to study beyond the time the doctor's note says you're incapacitated. If you are incapacitated for more than a week or so beyond the end of the term, your grade in the course will be an "Incomplete". In such cases you must negotiate a plan with your instructor for completing the course requirements. Once you make up the course requirement the instructor will change your "I" to the appropriate letter grade.

School Closings and Delays: Information regarding official University closing and delays can be found on the campus website and the snow phone line: (301) 405-SNOW (405-7669). Since our program is an evening program in downtown Washington, DC, rather than a day program in College Park, we do not always cancel classes on the same days as the College Park campus. The program director will always announce cancellation information to the program as an announcement on the program's ELMS/Canvas site. This will generally be done by 1:00 p.m. on days when weather or other factors are an issue.

UMD Counseling Center: Sometimes students experience academic, personal and/or emotional distress. The UMD Counseling Center in Shoemaker Hall provides comprehensive support services that promote personal, social, and academic success. The cost of these services is covered by the fees you already paid when you registered for classes, and there is no additional charge if you use the services. Proactively explore the range of services available, including the Counseling Service, Accessibility and Disability Service, Learning Assistance Service, and the Testing Office, all described at http://www.counseling.umd.edu/

Students with Disabilities: The University of Maryland does not discriminate based on differences in age, race, ethnicity, sex, religion, disability, sexual orientation, class, political affiliation, or national origin. Reasonable accommodations will be arranged for students with documented disabilities. Students who have an accommodations letter from the Accessibility and Disability Service (ADS) should meet with me during the first week of the term to discuss and plan for the implementation of your accommodations. If you require reasonable accommodations but have not yet registered with ADS, please contact the Accessibility and Disability Service at 301-314-7682 or adsfrontdesk@umd.edu.

Academic Progress: The UMD Graduate School requires that students maintain a GPA of at least 3.0. Students whose cumulative GPA falls below 3.0 will be placed on academic probation by the graduate school. Students on academic probation must ask the program's director to petition the graduate school if they want to remain enrolled in the program. The petition must include a plan for getting the student's GPA up to at least 3.0. Students who do not live up to their plan can have their enrollment in the program terminated without having earned the degree. Note: a grade of "B" corresponds to a GPA of 3.0. A grade of "B-" corresponds to a GPA of 2.7.

Laptop Computer Requirement: Completing some of this course's requirements will require a laptop computer (not a notebook or a tablet!) with at least 1 GB of RAM and at least 5 GB of free space available on the hard-drive. We recommend laptops with a 15-inch screen. Screens smaller than 13 inches are probably not practical. Because the course is an online course, students also need to have webcams and microphones. Students are expected to participate with their camera on during synchronous online sessions and office hours.