SS 340 - Cause and Effect
Fall 2021

Instructor: Loujaina Abdelwahed
Email: loujaina.abdelwahed@cooper.edu
Office Hours: Please click here to book an appointment when you need
Class Meeting: Monday 9:00 - 11:50 pm - 41 CS room 427

Course Overview

Causal analysis is a skill that ALL students must learn. Every day, we hear news reporters, podcast hosts, TV show hosts, and even professors talking about various issues, and along the way, they make causal claims that do not necessarily make sense. They are simply confusing correlation with causation; a common logical fallacy.

Think about the following question: Does getting your master's degree causes you to earn higher income? By how much would those two additional years in school increase your earnings? Well, most people would say yes of course. Having a master's degree leads to a higher paying job. You can get data on various individuals, their educational attainments and their earnings. You can examine the relationship between these two variables. But are you actually measuring the impact of having a master's degree on earnings?

It might be the case that you decide to enroll in a master's program (and finish it) because you expect higher future earnings. Isn't that why you would do it in the first place? There might even be there is a third factor that leads to both obtaining a master's degree and earning more income; ability for example. If you are a "smart" person, then you will be able to obtain your master's degree (easily), and you can land a high-paying job anyway.

Here are other questions that you can try to think about in the same manner: Do Nike ads increase their shoes sales? Does having an Amazon Prime leads you to buy more from Amazon? Does health insurance improve people's health? Does hiring a new professor improves academic performance of Cooper students? Does giving aid to poor countries improve their economic performance?

The list of questions you can think about is endless. Evaluating the impact of a decision (at the individual level), a policy (at the government level), or some natural phenomenon (like countries endowed with oil) on various outcomes are types of questions that we engage in on daily basis. Answering these questions, the correct way, has a lot of implications for making better decisions at the individual, firm, or government levels.

In this course, we will learn how to think about these questions is a systematic way. The course will make you think critically about many claims that are being thrown at you by news reporters and even your professors! The course will also teach you how to work with various types of datasets to answer various questions in economics, psychology, business, politics, and sciences. You will learn common ways to summarize and present data, and find relationships between different variables.

Learning Objectives

The main aim of the course is to use data and econometric tools to answer cause and effect questions. In this course, students are expected to develop the following skills:

- Developing an intuitive understanding of correlation and causation
- Developing their critical thinking abilities
- Understanding of common regression-based econometric models
- Interpreting regression estimates and statistics
- Developing basic data analysis skills
- Using various software for data analysis (Excel, STATA, and Python).
- Developing empirical research skills in social sciences

In addition, students are expected to develop skills that are applicable to all social sciences and field-specific courses, such as:

- Interpreting data tables and graphs
- Responding to questions and criticism, critiquing other people's ideas and providing helpful suggestions to improve other students' work
- Presentation and public speaking skills

Important Dates

- **Monday, Aug 30**: Fall 2021 begins.
- **Monday, Aug 30 - Tuesday, Sep 7**: Add/drop period.
- **Monday, Sep 6**: Labor Day - Enjoy your last day off in more than 2 months.
- **Monday, October 18**: Midterm Exam.
- **Wednesday, Oct 27**: Last day to withdraw from classes.
- **Thursday, Nov 25 - Friday, Nov 26**: Thanksgiving - Enjoy the Turkey!
- **Thursday, Dec 9 - Friday, Dec 10**: Study Period
- **Monday, Dec 13**: Final exam for this class and we are done!

Textbook

Joshua D. Angrist & Jorn-Steffen Pischke, *Mastering 'Metrics: The Path from Cause to Effect.*

This "textbook" does not feel like one. It is a very easy to read, and informative text. It is a must-have book. Besides, it is very affordable ($28 for a new copy on Amazon).

In addition, I will assign research papers so you can see applications for the techniques we discuss in class. Most of the papers I will assign will be from the economics and public policy literature. Unfortunately, that

is what I know about the most. However, I am very open to discussing other academic papers that you suggest as long as they relate to the topic of assessing causality. **Reading the research papers is VERY important because it will help you write your own research paper at the end of the semester.**

Software

For this course you will need Excel and another more sophisticated statistical package (options include Stata, R, Python).

I do not care which package you choose. But please note that I am proficient in using Stata, ok in R, and relatively basic in Python.

Stata is a statistical package that will help you clean the dataset, run regressions, and generate fancy-looking graphs like the ones you see in papers. It is very user-friendly and there are a lot of online resources for it. Here are several resources for learning to use Stata:

- Official: `http://www.stata.com/support/documentation/`
- Tutorials: `http://www.ats.ucla.edu/stat/stata/modules/`
  `http://data.princeton.edu/stata/`
- Forum: `http://www.statalist.org/forums/`

Stata is an expensive software, so do not try to purchase it. Cooper has recently purchased a license for Stata, which you can access remotely via AWS Appstream. You will need to sign in using your Cooper email and password.

Grading

Problem sets (25%)
There will be bi-weekly problem sets for the first 10 weeks of class (5 problems sets in total). The problem sets will be a combination of conceptual questions and practical problems that require you to use data and write a stata/python code.

When submitting your problem set, please make sure you abide by the following policies to ensure that your work is properly graded:

- Always show all your work. Credit will not be given for answers that are not clear and do not explain the steps used to reach them.
- No late problem set will be accepted (AT ALL).
- You can collaborate with other students while solving the problems, but you will have to turn in your own solutions.
- Please start working on the problem sets early so that you can get help if you need. See my email policy for more details.
- When you finish your homework, save it as a .docx (no PDF PLEASE), name the file *lastname_firstname* and upload it to your OneDrive folder.
- There are NO EXCEPTIONS to these policies

In class activities (10%)

Each class period will involve various learning activities and quizzes. These are designed to help you master the material and self-reflect on your own progress. There will be no make-up activities/quizzes.

Mid term and final exams (30%)
Two exams will be administered during class time. Students must take both exams and no makeups will be given unless in extreme circumstances.

Research project & presentation (30%)
Students are required to come up with their own research questions, think about obtaining casual estimates, gather data, use Stata to run regressions and answer their research questions. The final product is an empirical research paper.

Attendance and participation in class discussions (5%)
Yes! this is the subjective part of the course grade. And no! not everyone is guaranteed to get this 10% if they just show up to class and solve homework for other classes. I will use this 10% to to make sure you come to class, do the readings, and participate in giving your colleagues constructive feedback. Your class participation grade is going to be based on how effectively you contribute to class discussion and how much help you provide to your colleagues through giving them constructive feedback on their presentations. The class is very small anyway, so I will be able to track who is doing what!

Other Policies

Academic Integrity
Students are expected to be aware of the University's academic integrity policy and closely adhere to it. Please note that plagiarism will NOT be tolerated (in any written material, whether it is homework or paper). Plagiarism will result in a failing grade. More details about academic integrity can be found on `http://cooper.edu/humanities/curriculum/academic-integrity`.

Students with Disability
The Cooper Union is an equal opportunity institution that admits students without regard to their disabilities. The Cooper Union makes reasonable accommodations and modifications to policies, practices and procedures and provides auxiliary aids and services necessary to meet the needs of students with disabilities on campus. Students with disabilities seeking any accommodations, modifications or auxiliary aids or services regarding any aspect of the full Cooper Union experience - including anything pertaining uniquely to one of the Cooper Union's distinct schools - should contact the Dean of Students for assistance. More details can be found on `http://cooper.edu/students/student-affairs/disability`

MS Teams
This semester, I will try to use MS Teams as a substitute for Moodle. All supplemental material, handouts, slides, announcements, etc will be posted on Teams. You will be graded on your participation in discussions on MS Teams. Also, the homework assignments will be posted there. It will be updated regularly. I will also be sending all announcements via Teams.

Late Assignment
All assignments are during class on the due date. Any assignments that are submitted later will be counted as late. Late assignments will have 20 percentage points deducted.

Regrading/ Appeal
If a student thinks that their exam/ problem set grade is too low, a written appeal should be submitted to me. The appeal is one double-spaced page that contains an argument as to why a particular grade should be changed. You should be precise about why you think I graded your answer wrongly. The appeal should be submitted in the week after I return your written work. Anything submitted after this will not be accepted and your grade will not be revisited.

Attendance Policy
Attendance is mandatory. I take attendance randomly. I can take it at the beginning, middle, or end of class. Please note that I allow excused absences. If you expect to miss one or two classes, please report to me as early as possible indicating the date and reason for your absence. You must let me know at least one week ahead of time regarding a religious holiday conflict with an exam or an assignment.

Email
Email is the best way to reach me. Here are some email rules that I would like you to be aware of/ follow:

- If you email me any time between 9 am and 5 pm (Monday through Friday), expect a response on the same day.
- If you email me after 5 pm, expect the response in the morning.
- This semester, I am going to try to not work on weekends because I have a big research project that I need to work on. So, do not expect responses in the weekend.
- These rules apply even if you have an exam the following day.
- Please do NOT email me questions for which the answer is clearly stated in the syllabus (e.g. exam time, grading policy, etc.) Please check the syllabus to see if your question is already answered before writing.
- Please keep your email concise and to the point.
- Here is a link to useful advice on how to write emails to your professors, employers or professional peers.

General Courtesy Rules

- Please make every effort to come to class on time.
- Please do not leave the class in the middle (even if you need the restroom). Walking in and out of the class during the lecture is very disturbing for me and for your colleagues.
- Make sure to turn off your cell phones.
- Make sure you meet your deadlines.

- I hate electronics (cell phones, tablets and laptops). Yes! I am very old-fashioned when it comes to the use of electronics in class. Using electronics during class often distracts other students. It also distracts me as I keep thinking about what you might be browsing and whether you are paying attention or not.
- You do not have to call me "Professor". Just call me Loujaina.

Tips to do well in class

- Make every effort to attend class.
- I only provide my PowerPoint presentations, which are not considered sufficient study material. So, make sure to take as good of notes as possible.
- My advice is: USE A PEN AND PAPER/NOTEBOOK TO TAKE NOTES. DO NOT WRITE NOTES ON YOUR LAPTOPS DURING CLASS. Research has shown that handwritten notes are more effective for the learning process than laptop-taken notes. See the papers by Mueller and Oppenheimer (2014) in the journal of Psychological Science (`http://pss.sagepub.com/content/early/2014/04/22/0956797614524581.abstract`); Van der Meer & Van Der Weel (2017) in Frontiers in Psychology journal (`https://www.frontiersin.org/articles/10.3389/fpsyg.2017.00706/full`).
- Do the readings before class so you can keep up with the class.
- Do NOT be afraid to ask questions. There is no such thing called "stupid question". All questions are relevant and will help everyone else learn well.
- After each class and before the next class, review and preferably rewrite your notes.
- Make sure that you do not fall behind. If you are missing anything (either few points or the whole section) do not hesitate to come and see me. It is very important that you keep up with the class because every time, we build upon what we established before.

Topics

Week	Topics	Related Chapters	Problem sets
Week 1	Introduction to Statistics	Appendix Chapter 1	
Week 2	Treatment Effects		
Week 3	Randomization	Chapter 1	PS 1 posted
Week 4	Simple Regression	Chapter 2	PS 1 due
Week 5	Multiple Regression	Chapter 2	PS 2 posted
Week 6	Quasi-random experiments		PS 2 due
Week 7	**Midterm Exam**		
Week 8	Instrumental variables	Chapter	PS 3 posted
Week 9	Instrumental variables	Chapter	PS 3 due
Week 10	Panel Data - Introduction		PS 4 posted
Week 11	Difference in differences	Chapter 5	PS 4 due
Week 12	Difference in differences	Chapter 5	PS 5 posted
Week 13	Fixed Effects		PS 5 due
Week 14	**Presentations**		
Week 15	**Presentations**		
Week 16	**Final Exam**		

The instructor reserves the right to alter the course material in a way that she determines academically advisable. Changes will be announced in class.

Last Updated : August 2021