Econometrics II
ECON 338

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McGill University
Winter 2021

Course description and objectives

The course aims to introduce students to the use of econometric methods, to give them an appreciation of their scope and their usefulness in securing identification of economic magnitudes, and to give them an understanding of the properties of a variety of econometric procedures in relatively simple settings.

On completing this course students should have an appreciation of the purpose of econometric analysis and a sufficient awareness of basic econometric techniques to be able to understand the presentation of basic econometric results in academic articles and professional reports and to critically appraise their usefulness and appropriateness. The course assumes that students have taken ECON 337.

Administrative Issues

3 credits. 2 lectures per week: Tuesday and Thursday, via Zoom. You will find the Zoom link on mycourses.
Note: All times refer to the Montreal time zone.

Contact:
course email: `e338winter2021@gmail.com`
my email: `mayssun.el-attarvilalta@mcgill.ca`
office hours: via Zoom, times posted on mycourses.
For any matter related to the course, write to the course email.

Course Delivery: Lectures will be delivered live on Tuesdays and Thursdays, 4:05pm-5:25pm. Each lecture will be recorded and will be uploaded afterwards to mycourses. Thus, each student who cannot attend the live lecture can watch the recording later on mycourses.

Office Hours: The TA will hold weekly office hours. In these sessions, the TA will be available to answer your questions, help you to review the course material, and help you solve problems and exercises. You will be able to reach the office hours via a Zoom link that you will find on mycourses.

Stata Conferences: The TA will hold a weekly conference to help you work with Stata. These conferences are optional. You will be able to reach the the conferences via a Zoom link that you will find on mycourses.

Answering questions by email: For any questions about the course, email `e338winter2021@gmail.com`. The TA and I will be answering questions sent to this email address.

Lecture Recordings: By enrolling in this course, you accept that lectures will be recorded. When attending a lecture "live", your image, voice, and your name (or preferred name) may be recorded, and your instructor may call your name during the lecture. As such, this personal information will be disclosed to classmates, whether during the lecture or in viewing the recording. By attending a lecture "live", you consent to being recorded and you accept that personal information of this kind may be disclosed to others, whether during the lecture or when viewing the recording. If you are not comfortable being in a lecture that is recorded, you may decide to not attend "live". Students who do not attend the live lecture are able to watch the video recording of the lecture later in *mycourses.*

Textbooks: The main content of the course will be developed in the lectures. Slides will be made available after each topic has been covered. The following textbooks are useful:

- Wooldridge, J.M. (2013), *Introductory Econometrics: A Modern Approach* 7th Edition, South-Western Cengage Learning, Mason. (This will be the main textbook for the course. It provides a practical approach to econometrics, and shows how the tools of econometrics are used to address real questions in policy analysis and other areas.)

- Angrist J.D. and Pischke J.S. (2009), *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, New Jersey.

- Angrist J. D. and Pischke J.F. (2015), *Mastering 'metrics: The path from cause to effect.* (This book covers key econometric tools for policy analysis using up to date, real-world examples. It is rigorous but easy to read, and uses only elementary statistics.)

- Cameron A.C. and Trivedi P.K. (2010), *Microeconometrics Using Stata* Stata Press. (This book integrates the discussion of econometric tools with their implementation in Stata, and provides a useful body of data sets and codes in Stata.)

Other books that could be relevant for isolated elements of the course are:

- Jeffrey Wooldridge, Econometric Analysis of Cross Section and Panel Data, The MIT Press, 2002. (The approach is up to date and not overloaded with algebra.)

- W.H. Greene, Econometric Analysis, 6th edition, Prentice-Hall, 2002. (Provides a lot of algebraic detail. This suits some people but not others.)

Grading: Assessment is by a midterm exam in class (20%), a group presentation (20%), a final exam (40%) and two assignments (20%).

The **midterm exam** will be made available through mycourses on Tuesday March 23 at 9am. You then have 48 hours to log into mycourses and open the exam. Once the exam has been opened, you will have 1.5 hours to complete the exam. There will be no lecture those days. The midterm exams will be take-home exams, which follow the open-book format. That means that during the exam you will be allowed to consult resources as specified by the instructor, however you are not allowed to communicate with other people about any aspect of the exam.

The **group presentation** will be team assignment (5 students per group). For this assignment, I will provide you with an article and you will have to explain it in class, focusing on the motivating the causal link of interest, explaining the dataset and the identification strategy used and discussing the limitations, the strengths and the results of the research analyzed.
Anticipated dates for the group presentations (note that on these dates the live class will be cancelled):

- Endogneity and IV: Tuesday, February 16 (from 4pm).

- Panel data and diff-in-diff: Tuesday, March 2 (from 4pm).

- Discrete choice models: Thursday, March 18 (from 4pm).

- Regression discontinuity design: Tuesday, April 13 (from 4pm)(class?).

During the term you will receive two **group assignments**. The groups should consists of five students. We will discuss some of the exercises in class or in the conferences and you will have the opportunity to raise questions concerning the exercises. For some of the exercises, you will need to use econometric software like Stata.

The **final exam** will be made available through mycourses in April at the date specified by McGill. On that date, you will have 48 hours to log into mycourses and open the exam. Once the exam has been opened, you will have 3 hours to complete the exam. The final exam will be a take-home exam, which follows the open-book format. That means that during the exam you will be allowed to consult resources as specified by the instructor, however you are not allowed to communicate with other people about any aspect of the exam.

Missed tests: If you must miss the midterm, the group presentation or one of the group assignments for justifiable reasons, the weight of the missed test will be distributed among the other components of the evaluation. For this, you need to email me a justification, with proof, within one week of the test. Please note that the option of distributing the grade is applicable ONLY if you miss the midterm for justifiable reasons as determined by me ('the instructor') and subject to written confirmation deemed acceptable by me. If you miss one of the tests without my approval you get a mark of zero for it.

Regrading: If you have any concerns regarding grading please get in touch with me. Mistakes in tallying scores would be corrected immediately. If you have other concerns about grading,

please let me know. In such a case you must submit your entire exam for a regrade. Requests to regrade specific questions only will not be entertained.

Note: In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

In case of absence at the final exam for medical reasons, please refer to the University Regulations Concerning Final Examinations. Note: According to Senate regulations, instructors are not permitted to make special arrangements for final exams. Please consult the Calendar, section 4.7.2.1, General University Information and Regulations at www.mcgill.ca. Also note: In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. Finally: In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

MyCourses: You should regularly check the **myCourses** page for announcements, up-to-date information, additional readings, class notes, problem sets and other items to assist you in the course.

Academic Integrity: Cheating is bad, everywhere and always. It is your responsibility to understand what is meant by "cheating" at McGill, and thus what behaviour is unacceptable. I am required to have the following statement on the course outline, in both official languages:

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the code of student conduct and disciplinary procedures (see http://www.mcgill.ca/integrity/ for more information).

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site http://www.mcgill.ca/integrity).

Course Outline

Due to time constraints, it is possible that some topics will not be covered or some topics added. I maintain discretion regarding changes in this outline. Any changes will be announced in class and/or on MyCourses.

1. Introduction

   - Steps in Empirical Analysis
   - Causality and the Notion of Ceteris Paribus
   - Randomized Trials

2. Classical Regression Model (Review).

3. OLS failures: heteroskedasticity, autocorrelation, clustering and multicollinearity (Review).

4. OLS failures: endogeneity.

   - Failure of the orthogonality conditions and consequences.
   - Causes of failure: omitted variables, measurement error, reverse causality.
   - Estimation:
     - Instrumental variables.
     - Two stage least squares.
     - Introduction to simultaneous equations.

5. LATE interpretation of IV.

6. Introduction to panel data:

   - Random Effects and Fixed Effects models.
   - Difference-in-differences.
   - Dynamic panel data models.

7. Maximum likelihood and discrete choice models:

   - LPM, logit and probit.
   - Conditional logit and multinomial logit.
   - Ordered probit.

8. Regression Discontinuity Design