ABIZ 7260 Econometrics with Applications in Food, Agribusiness and Resources (Fall 2023)

Lectures: Room 365, Agriculture Building

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Class days and time: Monday and Wednesday (9:00 am to 10:30 am)

Office Hours: You can send an email to schedule an appointment.

The best way to communicate is by email. Please call if you have not received a reply in 2 business days.

The course outline consists of three parts- A, B, and C.

Part A: This section is crucial to form your understanding on algebraic properties of OLS that will set the stage for advanced topics which we will cover in part B and part C. It will also give you a sneak-peek into things such as: why as applied economists we are interested in unbiasedness of OLS? or why are we so concerned about the consistency of OLS estimator? or what are the practical aspects of hypothesis testing. *Some advice: Be mentally prepared as all this will be slightly more intense than a regular overview of regression and will also include some derivations/proofs.* But all the concepts of interest will be covered in class. We will have short lab sessions within class to get ourselves acquainted with Stata and R. Given that this is a review, we will go over selected topics covered in chapters 1-8 of Wooldridge. I highly recommend reading pages 16-95 in Scott Cunningham's book "Causal Inference: The Mixtape" which I will be referring to frequently in our discussions in class. It is not exactly a textbook but a fun-companion to assist us in our discussions. The topics may include the following:

1. Probability review; derivation of ordinary least squares estimates; incorporating nonlinearities in regression; proving unbiasedness of OLS under Gauss Markov assumptions; sampling variances of OLS estimator; unbiased estimation of error variance.
2. Direction and magnitude of biases due to omitted variables; consistency of OLS estimator; statistical significance versus practical significance; estimation in the presence of perfect and imperfect multicollinearity; dummy variables (and the dummy variable trap).
3. Heteroscedasticity: consequences of using OLS in the presence of heteroscedasticity; robust standard errors; the white test; weighted least squares estimation including feasible GLS; difference between OLS and GLS.

Part B: Now from here on, we will be discussing advanced topics. My advice to you: Keep a good track of lectures and be prepared to use Stata or R more often. You will be given short coding assignments. The code and dataset for these will be provided to you on UMLearn. You will be asked to run and submit the modified code through the UMLearn submission portal. *Companion book for R (check additional reference no. 3): Using R for Introductory Econometrics. Companion website: https://www.urfie.net/* . We will not be doing any derivations and will mainly focus on gaining hands-on experience of econometric modelling. Mostly we will cover selected Stata examples from Wooldridge (and in some cases possible replications in R). For this part, you can refer to chapters 9, 13, 14, 15, 16, and 17 of Wooldridge. For curious souls: Again, I will highly recommend reading Scott Cunningham's book especially for topics of instrument variables, average treatment effects, and difference-in-difference. Selected topics from the chapters in Wooldridge will be covered in class. The topics may include the following:

4. Endogeneity: omitted variables in a regression; instrument variables (IVs), identification, the problem of weak instruments, and two stage least squares (Wooldridge chapters 9 & 15)
5. Simultaneous equation models: simultaneity bias in OLS; identifying and estimating a structural equation; systems with more than two equations (Wooldridge chapter 16)
6. Panel data (Wooldridge chapters: 13 & 14):
    - Policy analysis with pooled cross sections: this will include brief overview of difference-in-difference estimator; natural experiment; average treatment effect.
    - Fixed effects and random effects models. If time permits, then might also take a cursory look at dynamic models.
7. Multiple regression analysis with qualitative information: linear probability model (revisiting Wooldridge chapter 7: section 7.5); logit and probit for binary responses; tobit model. (Wooldridge chapter 17: sections 17.1 and 17.2). If time permits then we might also take a cursory look at poisson, censored, and truncated regression models.

Part C: This section will mostly cover both introductory and some advanced time series. Again, the focus is on econometric modelling of time series data. You will be given short coding assignments. The code and dataset for these will be provided to you on UMLearn. You will be asked to run and submit the modified code through the UMLearn submission portal. *Companion book for R (check additional reference no. 3): Using R for Introductory Econometrics. Companion website: https://www.urfie.net/ .* Mostly we will cover selected Stata examples from Wooldridge (and in some cases possible replications in R). For this part, you can refer to chapters 10, 11, 12, and 18 of Wooldridge. Selected topics from the chapters in Wooldridge will be covered in class. The topics may include the following:

8. Time series regression analysis: alteration of classical assumptions for OLS models using time series data; asymptotic properties of OLS using time series; stationary and nonstationary time series; tests for unit roots; trend and seasonality; serial correlation; autoregressive conditional heteroscedasticity (including some volatility modeling: using ARCH); basic regression model examples including static and distributed lag models; spurious regression; cointegration; error correction models; some forecasting.

Grading:

Home assignments: 15 percent of course grade
Lab assignments: 5 percent of course grade
Reflection series: 10 percent of course grade
Midterm: 20 percent of course grade
Final exam: 25 percent of course grade
Term Paper (application): 25 percent of course grade

Things to note:

1. **Lab assignments** and associated data sets will be posted on UMLearn. You will work through the Stata/R code posted to complete your assignment. At the end of the lab session, you will submit your modified code file through UMLearn.
2. **Homework assignments** will include questions on both analytical and empirical parts.
3. For the **reflection series**, you will be asked to reflect on a concept discussed in lecture and elaborate on the concept's utility (in not more than 100-150 words) for an agricultural economist. This will require you to do some research on your own. There are no right or wrong answers to the questions in this series. The idea is to get you into the habit of brainstorming over concepts/ideas at your own pace.
4. **Term Paper** for Course: You are to present a paper (approximately 15-20 pages, excluding computer print outs) applying econometric methods to data. The paper will generally be related to agriculture, agricultural economics, agribusiness, resource economics, etc. In applying econometrics to your data, you may use any reasonably sophisticated econometric or statistical package. The paper should include the following sections:
   a) Introduction - briefly explain the problem or issue and why it is important.
   b) Data - briefly describe your data, data sources and limitations (possible measurement errors) in your data.
   c) Present a particular multivariate regression model and clearly explain why it is important in terms of understanding your problem or issue.
   d) Discuss any important variables omitted from the study due to inadequate data and how this is likely to bias estimation and hypothesis testing.
   e) Carefully explain your methodology for specifying and estimating the regression model and testing hypotheses.
   f) Carry out your methodology, explaining and interpreting results carefully, and modifying your methodology as appropriate
   g) Explain how your econometric results help (or do not help) you understand the problem or issue at hand
   h) Provide a candid assessment of the limitations of your study and how future research might try to address these.

Textbook:

Required: Wooldridge, Jeffrey M. Introductory Econometrics: A Modern Approach. 7th edition. (*Honestly, feel free to use any edition of this book.*)

Reference:

Required: Cunningham, S. Causal Inference-The Mixtape. Yale University Press. 2021.

Additional References (specifically for R usage):

1. Ekstrom, C.T. (2017). The R Primer. 2nd edition. CRC Press
2. Field, Z., Miles, J., & Field, A. (2012). Discovering statistics using R. SAGE
3. Heiss, F. (2016). Using R for Introductory Econometrics. Companion website: https://www.urfie.net/

Academic Honesty: All university of Manitoba guidelines for academic honesty apply in this class. Students are expected to do their own assignments and exams. Plagiarism (presenting someone else's work as your own) or any other form of cheating in examinations, or term tests is subject to serious academic penalty. A student found guilty of contributing to cheating in examinations, term tests or assignments is also subject to serious academic penalty (see the University of Manitoba's Undergraduate calendar under General Academic Regulations and Requirements).

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Student Accessibility Service

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services website:

http://umanitoba.ca/student/saa/accessibility/

520 University Centre

204 474 7423

Student_accessibility@umanitoba.ca

Writing and Learning Support

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor's feedback.

These Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: http://umanitoba.ca/student/academiclearning/

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 201 Tier Building.

University of Manitoba Libraries (UML)

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments. Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you in-person. A complete list of liaison librarians can be found by subject or by name: http://bit.ly/1tJ0bB4. In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: http://bit.ly/1sXe6RA. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries' homepage:www.umanitoba.ca/libraries.

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

Student Counselling Centre

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:* http://umanitoba.ca/student/counselling/index.html

474 University Centre or S207 Medical Services

(204) 474-8592

Student Support Case Management

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

Student Support Intake Assistant http://umanitoba.ca/student/case-manager/index.html

520 University Centre

(204) 474-7423

University Health Service

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

University Health Service http://umanitoba.ca/student/health/

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness

Contact our Health and Wellness Educator if you are interested in information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.

Health and Wellness Educator http://umanitoba.ca/student/health-wellness/welcome.html

Katie.Kutryk@umanitoba.ca

469 University Centre

(204) 295-9032

Live Well @ UofM

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:

http://umanitoba.ca/student/livewell/index.html

Notice Regarding Copyright

All students are required to respect copyright as per Canada's *Copyright Act*. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community.

Visit http://umanitoba.ca/copyright for more information.

Your rights and responsibilities

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The Academic Calendar http://umanitoba.ca/student/records/academiccalendar.html is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form http://umanitoba.ca/registrar/

- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support http://umanitoba.ca/academicintegrity/ View the **Student Academic Misconduct** procedure for more information.

- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected conduct yourself in an appropriate respectful manner. Policies governing behavior include the:

Respectful Work and Learning Environment

http://umanitoba.ca/admin/governance/governing_documents/community/230.html

Student Discipline
http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html and,

Violent or Threatening Behaviour
http://umanitoba.ca/admin/governance/governing_documents/community/669.html

If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: http://umanitoba.ca/admin/governance/governing_documents/community/230.html More information and resources can be found by reviewing the Sexual Assault site http://umanitoba.ca/student/sexual-assault/

For information about rights and responsibilities regarding **Intellectual Property** view the policy http://umanitoba.ca/admin/governance/governing_documents/community/235.html

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site http://umanitoba.ca/faculties/

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations http://umanitoba.ca/academic-advisors/

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

http://umanitoba.ca/student/advocacy/

520 University Centre

204 474 7423

student_advocacy@umanitoba.ca