



ABIZ 4120: Intermediate Econometrics Section: A01 Winter 2022

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| Professor/Instructor: | Farhan Islam |
| Virtual Office Hour: | Friday 10:30 am – 11:30 am. (Zoom) by Appointment only Meeting ID and Password: Will be provided after booking an appointment |
| Email: | Farhan.Islam@umanitoba.ca |
| Lecture Time: | Tuesday and Thursday 1:00 PM – 2:15 PM |
| Lecture Room: | TBA |

Prerequisite

Written consent of instructor; this course assumes students have had a sound background in economic theory (e.g., micro and macro), as well as single variable calculus, linear algebra, and basic statistics. ABIZ 3080 or ECON 3180 is highly recommended.

Course Description

A course in applied econometrics that explores the regression model and how it may be applied. Special emphasis is placed on violations to the assumptions of least squares, specification error, and applying the model to production, marketing, forecasting and other applications. Students are expected to have a working knowledge of one of the major econometric software packages (e.g., SAS, Stata, MATLAB, R, GRETL, Python, Excel).

Course Objectives

- Know and understand the k-variable regression model.
- Be proficient in standard model applications and testing.
- Understand various forms of endogeneity including omitted variables, simultaneity, and measurement error.
- Know, understand and be able to prove the Gauss-Markov theorem.
- Understand various concepts of Machine Learning.
- Know and understand Monte-Carlo Simulation in Econometrics.
- Be able to identify and correct violations to identification and hypothesis testing.
- Know and understand standard panel data models allowing for fixed effects.
- Understand the differences between fixed and random effects panel data models, as well as other panel data estimators.

- Understand various time series models (e.g., AR, MA, ARMA, ARIMA, SARIMA, VAR, VARMA, SES, ARCH, GARCH, TARCH).
- Understand way a randomized experiment allows for a casual interpretation of empirical results.
- Know and understand how non-experimental techniques allow for a casual interpretation of empirical results.
- Know and understand the use of instrumental variables, difference in differences, matching estimators, and discontinuity in identification.
- Know and understand the maximum likelihood estimators used in non-linear estimation.
- Be proficient in application of prediction, cross validation, and classification models.
- Be proficient in reporting, interpreting, and drawing policy implications from econometric results.

Textbooks

Required Textbooks:

Jeffrey M. Wooldridge. *Introductory Econometrics: A Modern Approach*, 7th Edition, Cengage Learning. ISBN-10: 1-337-55886-9 ISBN-13: 978-1-337-55886-0 (Students must register with MindTap)

Recommended Textbooks:

- Humberto Barreto, DePauw and Frank Howland (2005). *Introductory Econometrics, Using Monte Carlo Simulation with Microsoft Excel*, Cambridge University Press. ISBN: 9780521843195
- A.C. Cameron and P.K. Trivedi (2005). *Microeconometrics*, Cambridge University Press.
- Baum. *An Introduction to Modern Econometrics using STATA*.

There will be several additional readings/journals for the course available on UMLearn and or UM Library. Details will be provided as needed throughout the term.

Course Materials

This course will be taught remotely until February 26 and in-person thereafter, unless there's a different directive from the university or the government. For the in-person portion of the course, we will observe the health-related protocol mandated by the university. Please check the COVID-19 Updates webpage of the university and the COVID-19 health and safety protocols to know what is expected of you for the in-person part of the course.

For in class lecture, students are expected to attend at least 80% of the lecture days, otherwise the class participation marks will be zero.

For classes that are delivered synchronously, videoconferencing, a device enabled with a camera and microphone is required. Further, you are expected to be in a location with a reliable Internet connection that is strong enough for streaming video. For recording attendance and class

participation, you will be expected to have your camera and microphone on during class time and exams. The instructor may tell you to leave your camera/mic on for the duration of the class or may require you to mute yourself and unmute yourself only at certain times.

Quizzes/Exams may be administered via the Respondus Lockdown browser, you will need a device (computer or iPad; smartphone will not work) with one of the following operating systems:

- Windows 10, 8, or 7 (note: will not work with Windows 10S)
- Mac OS 10.15 to 10.12, OS X 10.11, or OSX 10.10
- iOS: 11.0+ (iPad only)

You will need the Chrome browser. Other browsers such as Safari may not work.

All readings will be available free to students in UM Learn under the heading “readings”. Students will be responsible for knowing all the assigned readings for quizzes, assignments, and the final exam (see course schedule below).

Please respect copyright laws. Photocopying textbooks or other reading material is a violation of copyright laws and is unethical unless permission to copy has been obtained.

Course Deliverables and Evaluation

NOTE: There is NO FINAL EXAM in this course.

There are six graded components in this course:

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| Test 1 | 30% |
| Test 2 | 20% |
| Assignments | 15% |
| Class Participations and In Class Exercises | 5% |
| Research Paper | 20% |
| Presentations | 10% |

The tests are usually **closed book tests** and may contain a combination of multiple-choice questions, true/false, fill in the blanks, short or long questions, and quantitative analysis questions.

Make-up Tests

There is no Make-up test, however in some circumstances it will be scheduled for those who have a legitimate absence, or the marks will be adjusted as per Instructor’s discretion. It will be held on specific hour available by the professor and it is your responsibility to be present on the assigned date and time for your make-up test.

Students who miss the tests without a valid medical or compassionate reason will receive a mark of 0.

Test Requirements

- Students need to be prepared to show photo ID during the tests.
- Scientific calculators or financial calculators may be used for the exams. Cell Phones with calculators, PDA's, other Organizers, or programmable calculators (e.g., Graphical Calculators) will NOT be permitted to be used as calculators. Cell phones must be turned off during all classes and exams.
- If the Quizzes/tests are administered online, it may use **Respondus Lockdown Browser and Respondus monitor**. Every student must make sure they have video camera handy and working properly.
- Students must be punctual. If the tests are monitored through Zoom, students must join Zoom 10-15 minutes prior to the quiz. Those who enter the ZOOM room ten minutes later than the starting time scheduled will NOT be allowed to write the tests/exam. No time extensions will be given.
- If the quiz/tests are administered online, it is students' responsibility making sure your internet, computer, and camera is fully functional during quizzes.

In Class Exercises and class participation

Regular attendance is expected from you. All-important announcements will be made in the first 15 minutes of the start of the class and will not be repeated for the students who come late. You will be doing extra practice questions during class. These questions will help you understand the format of the questions of the tests. Also, this time could be used to get help with understanding topics. Your participation mark is your marks on the in-class exercises.

Students are expected to attend all lecture sessions. For in class lecture, students are expected to attend at least 80% of the lecture days, otherwise the class participation marks will be zero.

No make-up exercises unless students have a legitimate absence.

In case if the lecture is conducted online, zoom link with password will be visible on UMLEARN for the whole semester and your camera should be turned-on during the class so I can acknowledge your presence in class.

Electronic and Mechanical Devices

Students will need to have regular access to the UM Learn to access outlines, PowerPoint of the lectures, Quizzes, class information, email, and grades.

In case of online lectures and tests/quizzes, it is your responsibility to have internet and computer well functioned during classes and quizzes. Cellphones are not required for any element of the course, so their use during class time is strongly discouraged.

For Online and in-person lectures, recording of lectures and class discussions (by any means) is not permitted unless a student is registered with Student Accessibility Services and requires this support. **Zoom recordings will not be available to students.**

GRADE DISTRIBUTION

Grading will be based on the following conversion of marks to letter grades.

| Letter Grade | Percentage |
|---------------------|-------------------|
| A+ | 93-100% |
| A | 87-92.9% |
| B+ | 78-86.9% |
| B | 74-77.9% |
| C+ | 67-73.9% |
| C | 60-66.9% |
| D | 50-59.9% |
| F | 0-49.9% |

NOTE: In the event of a skewed distribution of grades, the total course marks may be curved up or down as necessary. All Final grades are subject to Department approval.

Important Dates

Test 1 - Tuesday, March 8, 2022, Time: 1:00 pm – 2:00 pm (In class or in UMLearn)

Test 2 - Tuesday, April 12, 2022, Time: 1:00 pm – 2:00 pm (In class or in UMLearn)

Project Paper Due Date – 11:59 pm, Saturday, April 16, 2022 (submit on UM Learn dropbox)

Presentation Dates – April 14, 19 and April 21, 2022 (probable).

Voluntary Withdrawal Date – April 25, 2022

Study Break (No Class) – February 22 – Feb 25, 2022

Research Paper

Topic:

The research paper can be about anything as long as it uses econometric techniques. I strongly advise you to discuss your topic with me before submitting your research proposal. It is a good idea to focus on a topic that you will be investigating further for thesis or other future work.

You are **not allowed** to use a research paper previously written for another course (at the least you have to convince me that the current project is significantly different than the previous work).

Data source:

You are free to choose any cross sectional or panel data source as long as it is publicly available, or it can be shared with me for replication purposes.

Methodology:

You will have to use econometric techniques introduced in the lectures or other advance econometrics not covered by the course (upon approval by me).

TIMELINE TO COMPLETE RESEARCH PROJECT

Project Proposal: word document (.docx format only) should be submitted by **11:59 pm, Saturday, February 26, 2022**, on UM Learn dropbox under the Assignments tab with a heading named as “**Project Proposal**”.

A two-page, single spaced proposal (excluding references) outlining the research project must include:

- Title of project
- Background, motivation and research question(s)
- Description of data source, sample, and variables that will be used.
- Description of econometric methodology
- A statement of expected results.

Final Paper should be submitted on or before **11:59 pm, Saturday, April 16, 2022**. The paper should be submitted on UM Learn under Assignments tab with a heading named as “**Term Paper**”.

- Paper submitted must be on 8.5 × 11-inch paper with 1-inch margins all round and 11-point typeface. The paper must follow APA format.
- The final paper will be evaluated based on format, writing¹, contribution to the literature, difficulty of the methodology and the extent to which it accomplishes objectives outlined in the research proposal and progress report. I will also evaluate the level of success the paper addresses concerns about the research that are raised by me and by other students throughout the course (during presentations, or after progress report or proposal).
- **Late submission will not be accepted.** Late papers will receive 0 marks. (Strict deadline).
- The term paper will be between 3,000 and 4,000 words and will be evaluated on the student’s ability to develop ideas and to integrate course concepts into their arguments. This involves both the content of the paper (ideas, arguments, etc.) as well as the presentation (grammar, spelling, clarity of writing, etc.).

¹ Academic Learning Center (<http://umanitoba.ca/student/academiclearning/>) provides many services to improve your writing. I strongly advise you to contact them if you feel that you require assistance.

- Minimum five peer reviewed academic journals required to support the paper.
- All supplementary material (e.g. do-files, data, etc.) should be made available to review. Do-files should be clearly labelled to facilitate replication of findings reported in the paper.
- **I will roughly be thinking about following scheme while marking the papers:** 95+ (Exceptional), 90-94.9 (Excellent), 85-89.9 (Very Good), 75-84.9 (Good), 65-74.9 (Satisfactory), C 64.9-55 (Adequate), D 64.9-50 (Marginal), F 49.9-0 (Failure)
- Minimum five peer reviewed academic journals required to support the paper.

Presentation

Each Student present an 8 – 10-minute presentation of the paper. Students will randomly be assigned. Slide decks must be submitted through UM Learn under Assignment tab with heading named “**Presentation**” on or before **11:59 pm, Saturday, April 16, 2022**.

Presentation days are April 14, 19 and 21 (probable). Every student should be present in all presentation days. Failure to do so will lose 25 % of their overall project and presentation marks.

Tentative Schedule

Please note that instructor reserves the right to change the schedule. I preserve the right to choose the teaching materials from the textbook and articles relevant to the topic.

- Introduction, review of least squares regression (Chapters 3 & 4)
- Least squares Asymptotic (Chapter 5)
- Time series econometrics (Chapters 10 & 11)
- Further issues in time series econometrics (Chapter 12 & 18) - Serial correlation. Heteroskedasticity, Unit Roots, and Error Correction modelling.
- Introduction to panel data (Chapter 13)
- Panel data further issues (Chapter 14) – Fixed effects, random effects, and dummy variable estimation.
- Instrumental variables (Chapter 15)
- Limited dependent variable models (Chapter 17) – MLE, Logit and Probit models, censored distribution, and truncated regression analysis.
- Empirical Project (Chapter 18)
- Monte Carlo Simulation
- Machine Learning

ACADEMIC INTEGRITY POLICY

It is critical to the reputation of the University of Manitoba and of our degrees that everyone associated with our faculty behave with the highest academic integrity. As the faculty that helps create business and government leaders, we have a special obligation to ensure that our ethical standards are beyond reproach.

Any dishonesty in our academic transactions violates this trust. Section 8 of the University Policies, found in The University of Manitoba Calendar, addresses the issue of academic dishonesty. Specifically, acts of academic dishonesty include, but are not limited to:

- using the exact words of a published or unpublished author without quotation marks and without referencing the source of these words
- duplicating a table, graph, or diagram, in whole or in part, without referencing the source
- paraphrasing the conceptual framework, research design, interpretation, or any other ideas of another person, whether written or verbal (e.g., personal communications, ideas from a verbal presentation) without referencing the source
- copying the answers of another student in any test, examination, or take-home assignment
- providing answers to another student in any test, examination, or take-home assignment
- taking any unauthorized materials into an examination or term test (crib notes)
- impersonating another student or allowing another person to impersonate oneself for the purpose of submitting academic work or writing any test or examination
- stealing or mutilating library materials
- accessing test prior to the time and date of the sitting
- changing name or answer(s) on a test after that test has been graded and returned
- submitting the same paper or portions thereof for more than one assignment, without discussions with the instructors involved

STUDENT SERVICES AND SUPPORTS

The University of Manitoba provides many different services that can enhance learning and provide support for a variety of academic and personal concerns. You are encouraged to visit the below websites to learn more about these services and supports. If you have any questions or concerns, please do not hesitate to contact your instructor or the Undergraduate Program Office.

| For Information on... | ...follow this link |
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| Admission, Registration, Tuition Fees, Important Dates, Final Exams, Graduation, and Transcripts | Registrar's Office |
| Academic policies & procedures, regulations, Faculty-specific information, degree and major requirements | Academic Calendar |
| Help with research needs such as books, journals, sources of data, how to cite, and writing | Library Resources |
| Tutors, workshops, and resources to help you improve your learning, writing, time management, and test-taking skills | Writing and Learning Support |
| Support and advocacy for students with disabilities to help them in their academic work and progress | Student Accessibility Services |
| Copyright-related questions and resources to help you avoid plagiarism or intellectual property violations | Copyright Office |
| Student discipline bylaws, policies and procedures on academic integrity and misconduct, appeal procedures | Academic Integrity |

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| Policies & procedures with respect to student discipline or misconduct, including academic integrity violations | Student Discipline |
| Students' rights & responsibilities, policies & procedures, and support services for academic or discipline concerns | Student Advocacy |
| Your rights and responsibilities as a student, in both academic and non-academic contexts | Your rights and responsibilities |
| Full range of medical services for any physical or mental health issues | University Health Service |
| Information on health topics, including physical/mental health, alcohol/substance use harms, and sexual assault | Health and Wellness |
| Any aspect of mental health, including anxiety, stress, depression, help with relationships or other life concerns, crisis services, and counselling. | Student Counselling Centre |
| Support services available for help regarding any aspect of student and campus life, especially safety issues | Student Support Case Management |
| Resources available on campus, for environmental, mental, physical, socio-cultural, and spiritual well-being | Live Well @ UofM |
| Help with any concerns of harassment, discrimination, or sexual assault | Respectful Work and Learning Environment |
| Concerns involving violence or threats, protocols for reporting, and how the university addresses them | Violent or Threatening Behaviour |

UNIVERSITY OF MANITOBA COVID-19 HEALTH & SAFETY POLICY

January 19, 2022

The University of Manitoba (the “UM”) is committed to maintaining a safe learning environment for all students, faculty, and staff. Should campus operations change because of health concerns related to the COVID-19 pandemic or other campus-wide emergency, it is possible that this course will move to a fully remote delivery format. Should the instructor be required to stay at home for an extended period and an alternate instructor not be available, the course may move temporarily to a remote delivery format.

PPE and Mask Wearing

In a face-to-face environment, our commitment to safety requires students to observe all physical distancing (2m) and personal protective equipment (PPE) guidelines set by the University (<https://umanitoba.ca/coronavirus>)

While on campus and in class, you must wear PPE (Personal Protective Equipment) as stipulated in current University policies, procedures, and guidelines. Students who fail to comply are subject to disciplinary action in accordance with the Student Discipline Bylaw and the Non-Academic Misconduct and Concerning Behaviour Procedure.

Medical-grade 3-ply masks are available at many locations on campus, including specific classroom locations, designated by your unit, the Elizabeth Dafoe Library (Fort Garry Campus)

and the Brodie Centre main doors (Bannatyne Campus). Additional PPE, if necessary for a specific learning environment, will be provided to you by the teaching unit.

If you do not follow masking and other requirements, you will be asked to leave the learning space and may only return to the class already in progress when you have complied with these requirements. Repeated issues will result in disciplinary action as previously noted.

Students should not eat or drink during class time.

Illness

Remember: **STAY HOME IF YOU HAVE SYMPTOMS OR ARE ILL.** If you become sick or are required to self-isolate, you should notify your instructor by email so you can develop a plan to complete the course learning outcomes while you are absent.

If you have symptoms, do not come to campus or any UM facilities. Complete the self-assessment on the Manitoba Public Health site and follow the guidelines, which may include booking a COVID-19 test.

What to do if you become ill while at UM:

1. Leave the classroom, lab, or workspace immediately. Continue to wear your mask while leaving the premises and/or while waiting for transportation.
2. Perform hand hygiene (soap and water or hand sanitizer) and avoid contact with others, and minimize contact with the physical environment.
3. Once at home, complete the MB self-assessment and follow the directions that are provided.
4. Inform your instructor(s) or, if in residence, the appropriate individual.
5. You must remain off-campus and all UM facilities until cleared to return in accordance with self-assessment, testing results, or MB Health requirements.

Recommended transportation options (in order):

1. Drive yourself home.
2. Pick-up by family or friend – remember to keep your mask on and to distance as much as possible, and where possible, open a window to improve ventilation.
3. Pickup by taxi/Uber:
 - Remain masked and perform hand hygiene before entering the vehicle.
 - Avoid touching the inside of the vehicle
 - Keep your mask on for the duration of the ride
 - Where possible, open a window to improve ventilation.
4. Winnipeg Transit buses - Winnipeg Transit has indicated that individuals that are ill must not use Transit.

ABOUT THE INSTRUCTOR

Farhan Islam, MA, BA, BSc. (Instructor)

Areas of Research Interest: Sustainability, Financial Derivative Modelling, Econometric Analysis, Statistical Modelling, Network Security, and Risk Management

Areas of Teaching Interest: Supply Chain Management, Leadership, Business Ethics, Organizational Behaviour, Leadership, Change Management, Human Resources Management, International Finance and Derivative Markets, Economics, Statistics, Applied Mathematics, Econometrics, Project Management, Agribusiness Management and Economics, Sustainability, Actuarial Studies, and Computer and Network Programming.

Mr. Farhan Islam is one of the respected Instructor at Asper Business School with vast teaching experience and interests. He has extensive experience in green sustainability, risk analysis, lean systems, and economic development. He has also been involved in developing and launching start-up small companies as well as government projects.

Farhan has taught wide variety of courses in Agribusiness, Economics, Statistics, Mathematics, and Management. Farhan also teaches at University of Winnipeg and Red River College. He is a business and Policy Consultant and runs an independent consultancy firm globally. He was a major researcher and was involved in policy consideration in University of Manitoba Transport Institute (UMTI) “GrEEEn Trucking Program” in 2011-2012 which become one of the major successful projects in UMTI.

Farhan is currently pursuing Chartered Financial Analyst (CFA), completing Project Management Professional (PMP), Actuarial designation (ASA), VMware Certification, and Lean Six Sigma Certification.