

Wayne State University - Department of Economics
ECO 7110 (001) 11457 - Econometrics II (Fall 2018)

Instructor: Vitor Kamada

Class: MW, 12:30 - 02:10 pm in 2072 FAB

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Office hours: MW, 4:10 – 5:40 pm, or by appointment.

1) Course Description

In the previous PhD course ECO 7100 Econometrics I, I taught Causal Inference topics such as Randomized Experiment and Matching Estimators. We also covered several Machine Learning techniques that complement and potentialize Causal Inference Methods. Now we are going even deeper in Causal Inference, covering Fuzzy Regression Discontinuity Design, Bayesian Structural Time-Series Model, Three-Stage Least Squares (3SLS), Correlated Random Effects, Arellano-Bond Estimator, Spatial Regression, and other topics.

2) Learning Outcomes

Develop a solid understanding of several econometric methods useful to read empirical papers and carry out your own empirical research. Specifically, by the end of the course, you will be able to pursue your own empirical questions by choosing an appropriate research design and being aware of its strengths and limitations.

3) Recommended Textbooks

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

Cameron, C. A. and Trivedi, P. K. (2005). **Microeconometrics: Methods and Applications**. New York: Cambridge University Press.

Cameron, C. A. and Trivedi, P. K. (2010). **Microeconometrics Using Stata Revised Edition**. Stata Press.

Sargent, T. J. and Stachurski, J. (2018). **Lectures in Quantitative Economic**. Available for free at: <https://lectures.quantecon.org/py/>

Sheppard, K. (2018). **Introduction to Python for Econometrics, Statistics and Data Analysis**. Available for free at: [https://www.kevinshppard.com/Python for Econometrics](https://www.kevinshppard.com/Python_for_Econometrics)

Wooldridge, J. (2010). **Econometric Analysis of Cross Section and Panel Data**. 2ed, Cambridge: MIT Press.

Wooldridge (2010) covers several topics of this course, but is relatively more advanced, and discusses assumptions of models in more detail. Wooldridge (2010) is highly recommended for IV and panel data. Cameron and Trivedi (2005) text is oriented to the practitioner with comprehensive coverage of methods and applications in microeconometrics. Angrist and Pischke (2009) cover the intuition of modern experimentalist paradigm. The other book of Cameron and Trivedi (2010) explains concisely the theory behind several estimators and how to implement it on Stata. If you want to learn Python, I recommend Sargent and Stachurski (2018) and Sheppard (2018). There is no reference for R, because I assume that you already learned from my previous PhD course: ECO 7100 Econometrics I.

4) Course Schedule

Date	Topics/Key Concepts
Week 1 Aug 29	1) Omitted Variables Wooldridge (2010): Ch 4.3
Week 2 Sep 3	Labor Day
Week 2 Sep 5	2) Measurement Error Wooldridge (2010): Ch 4.4
Week 3 Sep 10	3) Seemingly Unrelated Regressions (SUR) Wooldridge (2010): Ch 7.7
Week 3 Sep 12	4) Instrumental Variables (IV) and Two-Stage Least Squares (2SLS) Wooldridge (2010): Ch 5.1 and 5.2 Cameron and Trivedi (2005): Ch 4.8 and 4.9
Week 4 Sep 17	5) Proxy vs Indicator Variable Wooldridge (2010): Ch 5.3
Week 4 Sep 19	6) Control Function Approach Wooldridge (2010): Ch 6.1, 6.2, and 6.3
Week 5 Sep 24	7) Generalized Method of Moments (GMM) Wooldridge (2010): Ch 8 Cameron and Trivedi (2005): Ch 6

Week 5 Sep 26	8) Sharp Regression Discontinuity Design Cattaneo et al. (2018): Ch 2, 3, and 4. A Practical Introduction to Regression Discontinuity Designs: Volume I, Cambridge University Press.
Week 6 Oct 1	9) Fuzzy Regression Discontinuity Design Cattaneo et al. (2018): Ch 5 Angrist and Pischke (2009): Ch 6
Week 6 Oct 3	10) Difference-in-Difference (DiD) Angrist and Pischke (2009): Ch 5.2 Wooldridge (2010): Ch 6.5
Week 7 Oct 8	11) Simultaneous Equations and Three-Stage Least Squares (3SLS) Wooldridge (2010): Ch 9
Week 7 Oct 10	12) Fixed Effects (FE) and Random Effects (RE) Wooldridge (2010): Ch 10.1 to 10.6 Cameron and Trivedi (2005): Ch 21
Week 8 Oct 15	13) Correlated Random Effects Wooldridge (2010): Ch 10.7
Week 8 Oct 17	14) Arellano-Bond Estimator Wooldridge (2010): Ch 11.6 Cameron and Trivedi (2005): Ch 22.5
Week 9 Oct 22	15) Poisson and Negative Binomial Regression Wooldridge (2010): Ch 18.1 to 18.3 Cameron and Trivedi (2005): Ch 20
Week 9 Oct 24	16) Survey Data - Weighting, Clustering, and Stratification Cameron and Trivedi (2005): Ch 24 Wooldridge (2010): Ch 20
Week 10 Oct 29	17) Bayesian Structural Time-Series Model Brodersen et al. (2015). Inferring causal impact using Bayesian structural time-series models. Annals of Applied Statistics: Vol. 9, No. 1, 247–274.
Week 10 Oct 31	18) IV Probit Wooldridge (2010): Ch 15.7
Week 11 Nov 5	19) Multinomial, Conditional, and Mixed Logit Cameron and Trivedi (2005): Ch 15.1 to 15.4 Wooldridge (2010): Ch 16.2
Week 11 Nov 7	20) Nested and Ordered Logit Cameron and Trivedi (2005): Ch 15.6 to 15.9 Wooldridge (2010): Ch 16.3
Week 12 Nov 12	21) Quantile Regression Angrist and Pischke (2009): Ch 7 Wooldridge (2010): Ch 12.10
Week 12 Nov 14	22) Tobit Model Wooldridge (2010): Ch 17.1 to 17.5 Cameron and Trivedi (2005): Ch 16.1 to 16.4

Week 13 Nov 19	23) Heckman Selection Model and Full Information Maximum Likelihood Wooldridge (2010): Ch 19.1 to 19.6 Cameron and Trivedi (2005): Ch 16.5 to 15.7
Week 13 Nov 21	Holiday - No Classes
Week 14 Nov 26	24) Kaplan-Meier Survival Function and Hazard Rates Cameron and Trivedi (2005): Ch 17.1 to 17.5 Wooldridge (2010): Ch 22.1 to 22.3
Week 14 Nov 28	25) Cox's Proportional Hazard model Cameron and Trivedi (2005): Ch 17.6 to 17.12 Wooldridge (2010): Ch 22.4 to 22.5
Week 15 Dec 3	26) Spatial Autoregressive (SAR) and Spatial Durbin Model (SDM) LeSage (2008). Revue d'économie industrielle.
Week 15 Dec 5	27) Spatial Econometrics with PySAL Rey and Arribas-Bel (2018). Geographic Data Science with PySAL.
Week 16 Dec 10	Study Day
Week 16 Dec 12	Final Exam Research Proposal II

5) Grading

5.1) Your final grade will be assessed as follows:

Assignment	Weight	Date
Surveys*	1%	Wednesday, Sep 26 (at 4:00 pm)
Homework	19%	Check on Canvas
Lab	40%	Check on Canvas
Research Proposal I	15%	Wednesday, Oct 31 (at 4:00 pm)
Research Proposal II	25%	Wednesday, Dec 12 (at 4:00 pm)
Total	100%	

* You can answer the surveys "Demographics and Study Methodology" and "Early Course Evaluation" on Canvas.

Grading Scale

94+ = A
90+ = A-
87+ = B+
84+ = B
80+ = B-
77+ = C+
74+ = C

70+ = C-
67+ = D+
64+ = D
61+ = D-
Below 61 = F

5.2) Instructions for Surveys, Homework, Lab, and Research Proposal

Guidelines and detailed instructions about Surveys, Homework, Lab, Research Proposal are available on Canvas.

5.3) Makeup Policy for any Assignment

If you miss any Assignment, I will provide a makeup activity in the case of an excused and unavoidable absence. Then it is YOUR RESPONSIBILITY to provide satisfactory written documentation of an excused and unavoidable absence as soon as possible. For example, if you are ill – the accompanying doctor's note must say that you cannot (or could not) do the Homework or Lab. If the doctor's note does not state this clearly, your score will be zero.

6. Course Expectations

6.1) Clarifying Expectations

To succeed in this course, you'll need to invest a good amount of time and energy doing exercises outside the class time. If at any time you feel you're investing the required time and energy but aren't learning the material or improving your skills, contact me and I'll do my best to help you and to suggest additional resources and options. If you have questions or concerns that you believe can be handled via e-mail, feel free to contact me that way. If I cannot adequately respond to your question via e-mail, I'll ask you to come to my regular office hours or make an appointment.

6.2) Extra Credit

If you have more than 80% attendance, I will add 1 extra point (1%) to your final grade. If you have more than 90% attendance, I will add 2 extra points (2%) to your final grade.

6.3) Academic Integrity

Wayne State University aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Student Code of Conduct, please see <https://doso.wayne.edu/conduct/codeofconduct.pdf>. Students who commit or assist in committing dishonest acts are subject to sanctions described in the Student Code of Conduct.

6.4) Special Accommodations

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.