THE UNIVERSITY OF THE WEST INDIES

MONA CAMPUS
Department of Economics
Kingston 7
Jamaica, W.I.

ECON3050: Applied Econometrics

Year: Semester II, 2021

Pre-Requisite: ECON2015, ECON2009 & ECON3049 or MATH2140 & MATH2150

Anti-Requisite: None

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Office hours: Tuesdays 10-12pm; Wednesdays 11-12pm

Course Description

This course is the second of two courses in Econometrics at the undergraduate level. It is highly research-oriented and builds on foundations learned in ECON3049 by focusing on the practical application of econometric methods in solving econometric problems. To demonstrate its practicality, this course will incorporate environmental economic problems which are experienced locally, and the econometric methods used to solve them.

Learning Outcomes

Upon successful completion of the course, the student should be able to:

- use multiple regression analysis to establish a ceteris paribus relationship between a dependent variable and a set of independent variables.
- interpret the coefficients from OLS regression with different functional forms.
- determine statistical and economic significance of estimated coefficients.
- know the implications for OLS estimators if irrelevant variables are included or relevant variables are omitted from the regression.
- use and interpret dummy variables in multiple regression analysis.
- know alternative estimation methods.
- use different techniques to address endogeneity and remedy other specification problems.
- know the basics of multiple regression panel data.

- proficiently use the statistical software programme R to manipulate data sets and conduct multiple regression analysis.
- interpret regression output from R and conduct non-standard hypotheses tests.

Modes of Delivery

Each week, there will be three hours of lecture and software learning and application time. Note that this course will be highly interactive so learning and practicing happens simultaneously. There will be assignments to demonstrate and enhance econometric skills within R.

Assessment

Class Participation 20%
Group Assignments 30%
Research Project 50%

Course Outline

- Introduction to R Programming
- Review of Regression Models
  - Introduction
  - Residuals
  - Multivariable Regression, Examples & Interpretation,
  - Inference: Confidence Interval Estimation, Hypothesis Testing, P-Values, Goodness of Fit (R Squared and Adjusted R-Squared)
  - Statistical & Economic Significance
  - Estimation in R
- Data Loading and Manipulation in R, R Markdown and R Stargazer Application
- Panel Data Analysis with Application Exercises
- Econometric Foundation of Environmental Economics
- Modelling Air Pollution
  - Instrumental Variables Estimation
  - Hedonic Pricing Estimation
  - Estimation in R
- Modelling Extreme Environmental Events (Temperature & Hurricanes)
  - Extreme Value Theory
  - Block Maxima Estimation (Maximum Likelihood Method)
  - Peak over Threshold Estimation
  - Estimation in R (extRemes)

Important Notes:

- ***While you can work together, you must submit your own work. Any form of academic dishonesty, including plagiarism, will result in an F grade and a formal report made to the university.***

- ***This syllabus may be revised occasionally throughout the semester. That is, some topics may be added or deleted depending on the pace of the course. All changes to this syllabus will be announced in class.***

Resources:

Required Texts:

- Gujarati, D.N. and D.C. Porter, 2008. *Basic Econometrics*, 5th edition. McGraw-Hill/Irwin.
- Wooldridge, J.M., 2009. *Introductory Econometrics: A Modern Approach*, 5th edition. Cengage Learning.

*Recommended Texts***:**

- Ramanathan, R., 2001. *Introductory Econometrics with applications*, 5th edition. South-Western College Publishers.
- R. Carter Hill, William E. Griffiths, and George G. Judge, 2000. *Undergraduate Econometrics,* 2nd Edition. Wiley.

Journal Articles:

- Bento, Antonio, Matthew Freedman, and Corey Lang. "Who benefits from environmental regulation? Evidence from the Clean Air Act Amendments." *Review of Economics and Statistics* 97, no. 3 (2015): 610-622.
- Gilleland, Eric, and Richard W. Katz. "extRemes 2.0: an extreme value analysis package in R." *Journal of Statistical Software* 72, no. 8 (2016): 1-39.
- Gilleland, Eric, and Maintainer Eric Gilleland. "Package 'extRemes'." *Extremes* 18 (2019): 1.

R Resources:

- Swirl: Learn R, in R. Click on https://swirlstats.com/ (use learning tab & follow instructions. Easy!)
- R Tutor:
  - https://www.r-bloggers.com/rtutor-water-pollution-and-cancer/
  - https://www.r-bloggers.com/rtutor-the-effect-of-air-pollution-on-house-prices/
  - https://github.com/skranz/RTutor