THE UNIVERSITY OF THE WEST INDIES
MONA CAMPUS
Department of Economics
Kingston 7
Jamaica, W.I.

ECON9005: Advanced Econometrics I

Year: Semester I, 2020
Eligibility Requirements: Acceptance into the PhD Economics programme
Pre-Requisite: Masters Econometric courses (ECON6003 & ECON6026);
Calculus (ECON2016), Matrix Algebra (ECON2015)
Anti-Requisites: None

Lecturer: Nadine McCloud

Office Hours: Monday 11:00 a.m. - 1:00 p.m. Venue: Click Here

Wednesday 11:00 a.m. - 1:00 p.m. Venue: Click Here

Course Description

This course provides students with a working knowledge of linear econometric models. To this end, the properties of the linear conditional means model under the classical assumptions are presented in detail. The course departs from the standard Gauss-Markov assumptions to included heteroskedasticity, serial correlation, errors in variables and endogeneity. Advanced topics include generalized least squares, instrumental variables, nonlinear regression, and limited dependent variable models. Economic applications are discussed throughout the course.

Learning Outcomes
At the end of the course, students should be able to:
- Use linear econometric models for data analysis
- Diagnose these models for violations of their underpinning assumptions
- Provide remedies for the violation of these assumptions
    - heteroscedasticity
    - functional form misspecification of conditional mean
    - omitted variables, errors-in-variables
    - autocorrelations
- Analyze models involving systems of linear regression equation
- Analyze linear regression models with lagged dependent variables
- Estimate models with linear simultaneous equations.
- Estimate models using instrumental variable estimation techniques
- Estimate models using maximum likelihood estimation techniques

Modes of Delivery: Three lecture hours per week.

Assessment: Mid-term Exam (40%) AND Final Exam (60%)
Syllabus

1. Introduction, Notation and Review (week 1)
   Readings: Chps 1 & 2 in JW; Chp 1 in WG

2. Multiple Linear Regression (weeks 2 and 3)
   - Geometry of the Linear Regression Model
   - Statistical Properties of Ordinary Least Squares
   - Hypothesis Testing in Linear Regression Models
   Readings: Chps 4 in JW; Chps 2, 3, 4, 5 & 6 in WG

3. Asymptotic Theory (weeks 4 and 5)
   - Models of convergence
   - Least Squares Asymptotics
   Readings: Chp 3 in JW;

4. Generalized Least Square (weeks 6 and 7)
   - Feasible and Infeasible GLS
   - Applications to heteroskedasticity and serial correlation
   Readings: Chps 4 & 7 in JW; Part II, Chps 9, 10 &11 in WG

5. Instrumental Variables Estimation and Related Models (weeks 8 and 9)
   - Choice of instruments and estimation
   - Validity and Exogeneity Tests
   Readings: Chps 5, 6, 7, 8 & 9 in JW; Chp 8 in WG

6. The Maximum Likelihood Method (weeks 10 and 11)
   - MLE of the Linear Regression Model
   - Asymptotic Testing
   Readings: Chp 13 in JW; Chp 14 in WG

7. Generalized method of Moments (week 12)
   Readings: Chps 8 & 14 in JW; Chps 12 & 13 in WG

8. Nonlinear models, Microeconometrics and Related Topics: A Primer (week 13)
   Readings: Part IV in JW; Part IV in WG

Resources

1. **Prescribed Texts**:
   - *Econometric Analysis* (8th Edition, Pearson)
     (WG) William H. Greene

   - *Econometric Analysis of Cross Section and Panel Data*
     (2nd Edition, The MIT Press)
     (JW) Jeffrey M. Wooldridge (2010)

2. **Highly Recommended Texts**:
   - *Econometrics* (Princeton University Press)
     Fumio Hayashi

   - *An Introduction to Classical Econometric Theory* (Oxford University Press, New York)
     Rudd, Paul A. (2000)

   - *Applied Econometrics with R* (Springer-Verlag)
     Kleiber, Christian and Achim Zeileis (2008)

   - *Mostly Harmless Econometrics: An Empiricist's Companion* (1st Edition)
     Princeton University Press
     Joshua D. Angrist and Jörn-Steffen Pischke

   - *Econometrics*. Available on-line here.
     B. E. Hansen (2020)

3. **Supplementary References:**

   Articles in Econometrica, American Economic Review, Journal of Economic Perspectives, Quarterly Journal of Economics, Journal of Money, Credit and Banking, etc.

4. **Software**:
   STATA/ R (free) - Language and environment for data manipulation