

AREC\ECON 736b  
Spring 2018

Advanced Econometrics Methods: Panel Data

TIME: 9:30-10:45 Tuesday-Thursday

**Instructor:** Marco Costanigro

**Contact:**

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**Office Hours** by appointment (PM hours)

Texts: **Required:** Microeconometrics: Methods and Applications by A.C Cameron and P. K Trivedi Cambridge University Press. 2005. ISBN: 0521848059

**Suggested:** Econometrics Analysis (sixth edition) by William Greene. Prentice Hall. ISBN: 0135132452

**Suggested:** Microeconometrics Using Stata, Revised Edition. by A.C Cameron and P. K Trivedi ISBN: 1597180734

Course Objectives:

The successful student will, by the end of the course, be able to:

- Identify data generating processes requiring panel-specific methods
- Choose the appropriate model and estimator (e.g. fixed effects, random effects), and defend the choice using theory and formal testing
- Empirically estimate models for panel data, and correctly interpret results
- Be aware of potential pitfalls and limitations inherent to the chosen modeling approach

Course topics

1. Linear panel models: pooled models, fixed effects and random effects
2. Extensions to the linear panel models: Generalized Method of Moment, dynamic models, Hausman-Taylor hybrid model, difference in differences estimator
3. Nonlinear panel models

Homework Exercises

I will assign 3 group homework exercises. You may work in groups of *up to 4 people*. If you choose to work in a group, which is highly encouraged, please submit only one copy of each assignment with the names of the participants on the front.

Computer Software:

No specific econometric software is mandated, but homework assignments will imply the joint use of “canned” software (e.g. STATA) and a matrix environment software (e.g. Gauss or MATA). While I will provide some basic guidance, I expect students to use manuals and online help to self-teach the use of the chosen statistical software.

Course Evaluation:

As a default, the grades are as assigned as follows: A =  $\geq 90\%$ ; B = 80-89%; C = 70-79%; D = 60-69%; F =  $< 60\%$ . Pluses and minuses will be used at the discretion of the instructor.

Group Homework Exercises	30%
Exam	70%

Course Policies and Exceptions

1. **Homework exercises** are due on the stated due date. Beyond that, no assignments will be accepted.
2. If you have a **documented disability** that requires special arrangements, please let the instructor know immediately at the beginning of the course.
3. **Academic integrity** is expected. No cheating will be accepted, period.  
This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog-1.6, pages7-9.  
<http://www.catalog.colostate.edu/Content/files/2012/FrontPDF/1.6POLICIES.pdf>  
and the Student Conduct Code  
<http://www.conflictresolution.colostate.edu/conduct-code>.  
At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.
4. Always show appropriate **respect** for your instructor and fellow students. This means, among other things, that **cell phones** should be muted prior to class.

Tentative class schedule (subject to change at the instructor's discretion)

AREC/ECON 736 b Panel Data Analysis	1	4/2/2017	21	linear panel models
	1		22	linear panel models
	2	4/9/2017	23	linear panel models
	2		24	linear panel models
	3	4/16/2017	25	GMM panel models
	3		26	GMM panel models
	4	4/23/2017	27	GMM panel models
	4		28	Nonlinear panel models (if time allows)
	5	4/30/2017	29	Nonlinear panel models (if time allows)
	5		30	Nonlinear panel models (if time allows)

Tentative list of topics (subject to change at the instructor's discretion)

1. Linear panel models (4/5 lectures)
  - a. Nature of longitudinal data: within and between variation
  - b. Unexplained heterogeneity in the individual effects model: correlated vs. uncorrelated effect
  - c. Linear panel models
    - Pooled OLS and robust estimation of the v-cov
    - Fixed (correlated) effect models
      1. LSDV model
      2. Within estimator
      3. First difference model
    - Uncorrelated effects models
      1. Between estimator
      2. Random effect model
  - d. Will it work? Conditions for consistency
  - e. Fixed vs. random effects: Tradeoffs and intuition
  - f. Which one to use? Random vs. fixed effect models (Hausman test)
2. Panel GMM (3 lectures)
  - a. The longitudinal dimension as a source of instruments
  - b. Random and fixed effects IV GMM
  - c. Hausman-Taylor hybrid model
  - d. Arellano-Bond Estimator
3. Nonlinear panel model (2-3 lectures)
  - a. General setup for nonlinear model
  - b. Fixed effects models and the incidental parameter model
  - c. The Poisson panel model