GOAL
This course presents econometrics methods used in analysis of panel data, with applications using the statistical package Stata. The course covers the major established methods for both short panels ($N \to \infty$) and long panels ($T \to \infty$), as well as more recently-developed methods for nonstationary long panels and correlation across individuals. In addition to the lectures computational exercises using Stata will be provided.

ORGANIZATION
9.00 - 10.30: First lecture
10.30 - 11.00: Break
11.00 - 12.00: Second lecture
12.00 - 13.30: Lunch
13.30 - 15.30: Third lecture

COURSE OUTLINE
Day 1: Short Panels: Basics
Data summary methods for panel data; pooled estimator; fixed effects estimator; random effects estimator; first difference estimator; Hausman test; clustered errors.; panel bootstrap.
Stata commands: xtset, xtdescribe, xtsum, xtdata, xtline, xttab, xttrans, reshape, xtreg, xtgee, xtgls, xtpcse, xtmixed, xtrc and add-on xtoverid

Day 2: Short Panels: Extensions
GMM estimator; clustered standard errors; instrumental variables estimator; Hausman-Taylor estimator; Arellano-Bond and Arellano-Bover estimator in dynamic models; short panel VAR.
Stata commands: xtivreg, xthtaylor, xtabond, xtdpd, xtdpdsys, and add-ons pvar, helm, sgmm

Day 3: Long Panels: Stationary Panels and begin Nonstationary Panels
Stationary panels; pooled estimators; heterogeneous panels; mean grouped estimator; common correlated effects estimator.
Stata commands: xtgee, xtgls, xtgreg, and add-ons xtscc, xtmg

Day 4: Long Panels: Nonstationary panels
Nonstationary panels; unit root tests; cointegration; cross-country correlation.
Stata command: xunitroot and add-ons xtdolshm, ltimbimata

Day 5: Further Topics
Cross-section correlation; nonlinear panel models.
Stata commands: xtgee, xtlogit, xtprobit, xtpoisson, xttobit and add-on xtpqml

COURSE MATERIAL
Stata programs, data sets and exercises will be posted at the course website http://cameron.econ.ucdavis.edu/korea2013/
I assume you have access to Stata and ideally can run Stata during the lectures. My programs are for Stata 12 but should also run in Stata 13, 11, and mostly in Stata 10. The main panel changes in Stata 13 are that command \texttt{xtmixed} is now command \texttt{mixed}, and that several more panel commands (and \texttt{mixed}) will now give cluster-robust standard errors.

\textbf{You need several Stata user-written add-ins.}\nThese include \texttt{xtoverid}, \texttt{pvar}, \texttt{helm}, \texttt{sgmm}, \texttt{xtsc}, \texttt{xtdolshm}, \texttt{ltimbimata}, \texttt{xtpqml}

\textbf{REFERENCES - The listed journal articles are not required for this course}

- For panel methods using Stata
    Chapters 8-10 cover panel data. Either the first edition or the revised edition will do.

- For panel methods theory one of the following panel texts should do.
    Earlier editions will also do, except the latest edition will be more up to date on the final chapter on nonstationary panels. The course covers material in many of the chapters of this book.
    Chapters 21-22 cover linear panel models and chapter 23 nonlinear panel models. There is only a small amount on long panels.
    Chapters 10-11 cover linear models and selected parts of chapters 15-19 cover nonlinear models. Only short panels are covered.

- 1. Short Panels: Basics
  - Covered in many textbooks.

- 2. Short Panels: Extensions
  - Most material is in Cameron and Trivedi (2009, 2010).
  - For short panel single-equation with fixed effects and lagged dependent variables
  - For short panel VAR with fixed effects
• 3. Long Panels: Basics
  
  – Interactive Fixed Effects
  
  – Heterogeneous Panels (mean grouped estimator, common correlated effects estimator)
  
• 4. Long Panels: Unit Roots and Cointegration
  
  – Panel Unit Roots and Cointegration Surveys
    * Stata Manual [XT] Longitudinal Data / Panel Data entry xtunitroot / Method and Formulas summarizes several panel unit root tests.
    * Eviews 8 Users Guide II Chapter 16 summarizes several panel unit root tests and also covers panel cointegration tests and estimation.
  
  – Unit Root Tests without Cross-sectional Dependence
  
  – Unit Root Tests without Cross-sectional Dependence
Panel Cointegration Tests


Panel Cointegration Estimation


Cross-Sectional Dependence in Panels with Cointegration

* Marcus Eberhardt’s website https://sites.google.com/site/medevecon/home This has many useful links to papers, data and Stata code, including Stata add-ons, for both cross-sectional dependence and unit roots.

5. Nonlinear Panels

Most material is in Cameron and Trivedi (2009, 2010).

* Fixed effects with incidental parameters problem