"Econometria Applicata"

Anno accademico 2023-24

Docente: Federico Tamagni (email: federico.tamagni@santannapisa.it)

Abstract:
Il corso presenta le principali tecniche econometriche per cross-section e panel data, discutendone in modo critico vantaggi e limitazioni in chiave applicata. I temi trattati coprono: proprietá e problemi di inconsistenza delle stime OLS; soluzioni al problema di endogeneitá via variabili strumentali; selezione del campione e modello di Heckman; metodi panel lineari; introduzione alle regressioni quantiliche. Il corso prevede sessioni di illustrazione dei metodi con dati reali, introducendo alle funzioni base del software STATA.

Materiali del corso: http://www.cafed.sssup.it/~federico/teaching.html

Testi di riferimento:

- Cameron and Trivedi (2005), "Microeconometrics: Methods and Applications", Cambridge University Press (di seguito indicato con CT)
- Wooldridge (2002), "Econometric Analysis of Cross Section and Panel Data", MIT Press (WO nels eguito)
- Angrist and Pischke (2009), "Mostly Harmless Econometrics", Princeton University Press (AP di seguito)
- Slides e appunti delle lezioni

Indice dettagliato degli argomenti:

1. Regression analysis and OLS: basics and problems
    - OLS and regression fundamentals: notation, CEF, regression anatomy, properties and inference (CT Capitolo 4.4; AP 3.1)
    - Sources of OLS bias: omitted variables and good vs. bad controls, measurement error and endogeneity (AP 3.1,3.2.2,3.2.3;CT 4.7)

2. Instrumental Variables (IV) "solution" to endogeneity
    - IV-2SLS estimators: properties and practical issues; weak instruments (AP 4.1,4.2; CT 4.8,4.9,8.4)
    - Endogenous dummy variable model: basics of Discrete Choice Models for Binary Outcomes (CT 14.1,14.2,14.3); forbidden regression (AP 4.6)

3. Linear Panel Data Models

   - The "panel solution" to the omitted variables problem
   - Overview of main methods: definition, examples, exogeneity assumptions underlying different panel methods (CT 21.1,21.2)
   - Models for strict exogeneity (CT 21, tutto)
     - Fixed-Effects (FE) vs. Random-Effects (RE) approach
     - Main estimators (POLS, RE-GLS and RE-MLE, LSDV, FE-WG, FE-FDiff): definition, underlying assumptions, sources of within-variation and parameter identification, interpretation and comparisons;
     - Focus I: non-spherical disturbances and properties of estimators;
     - Focus II: "fixed effects" in multi-dimensional panels
   - Relaxing strict exogeneity (CT 22.1,22.2,22.4,22.5; NON FARE 22.4.4, 22.4.5)
     - Introduction: internal instruments on FDiff transformed models;
     - Basics of panel-GMM: GMM vs. IV approach; GMM-DIFF vs. GMM-SYS;

4. Sample Selection (CT 16.5; WO 17.1,17.2.1,17.3,17.4)

   - Intuition, examples and origins of selection bias (observables vs. unobservables); inconsistency of OLS;
   - Hint toward a general solution: modeling the selectivity-bias term (parametric vs. non-parametric)
   - Parametric solution via "Two-equations/Two-steps Heckman" procedure: logic and problems (exclusion restriction; endogenous regressors)