Topic B: Pseudo Panels

Pseudo Panels

- What if you don’t have a panel?
- Can you pretend that you do?
- More common to have repeated cross-sections available
- These less likely to have problems of attrition and non-response

Pseudo Panels

- Deaton (1985) suggests the use of cohorts to estimate a fixed-effects model from repeated cross-sections
- Averages within cohorts treated as if they were observations within pseudo panel
- This is equivalent to an instrumental variables approach where the **grouping** variable is the instrument

Pseudo panels

$$y_{it} = \beta_1 + \beta_2 x_{it} + \lambda_i + \varepsilon_{it} \qquad E\left[x_{it}\varepsilon_{it}\right] = 0$$

Can be consistently estimated by pooling all cross-sections and running OLS treating $\lambda_i + \varepsilon_{it}$ as a composite error.

But in many cases the individual effects are correlated with the x variables. In a genuine panel this can be dealt with by using a fixed effects estimator

Deaton's Method for Deriving Consistent Estimates

Define C cohorts. Aggregate all observations to cohort level. Form

$$\bar{y}_{ct} = \beta_1 + \beta_2 \bar{x}_{ct} + \bar{\lambda}_{ct} + \varepsilon_{ct}, c = 1..C,\ t = 1..T$$

If we can assume that $\lambda_{ct} = \lambda_c$ then we can treat the λ_c as fixed unknown parameters in the same way as λ_i in the fixed effects model. Rather than calculate deviations from individual means, you use deviations from cohort time averages.

Pseudo Panels

- The properties of this estimator are complex. They depend on the number
- of cohorts and time periods and the asymptotic theory one chooses to apply. In the case of small-samples, biases may still be substantial.