

Topic 1: Panel Models: Applications



Panel Models

- What can we learn from datasets with many individuals but few time periods?
- Can we construct regression models based on panel datasets?
- What advantages do panel estimators have over estimates based on cross-sections alone?



Panel Models: A Selection of Applications Across Disciplines

- Winkelmann, L., Winkelmann, R. Why Are the Unemployed So Unhappy? Evidence from Panel Data
- Franzen, A., "Social Capital and the Internet: Evidence from Swiss Panel Data"
- Neumayer, E. Good Policy Can Lower Violent Crime: Evidence from a Cross-National Panel of Homicide Rates, 1980–97
- Vanlaningham, J, Johnson, D. & Amato. P. "Marital Happiness, Marital Duration, and the U-shaped Curve: Evidence From a Five-wave Panel Study"



Why Is Panel Data So Useful?

- Clearly panel data allow one to follow individuals/households/firms through time.
- Building up individual histories
- While this is an obvious benefit from panel data, it is not necessarily its main advantage



Example 1: The Behaviour of Wages over the Economic Cycle

- Macroeconomist's Views
 - Lucas (1977) "Observed real wages are not constant over the cycle, but neither do they exhibit consistent pro or countercyclical tendencies"
 - Mankiw (1989) "Over the typical business cycle employment varies substantially, while the determinants of labor supply – the real wage and the real interest rate – vary only slightly"
 - Blanchard and Fischer(1989) "The correlation between changes in real wages and output is usually slightly positive, but often statistically insignificant"



Solon (1994)

- The apparent weakness of real wage cyclicality in the United States has been substantially exaggerated by a statistical illusion. Solon(1994)
- “According to evidence from longitudinal surveys that have tracked individual workers since the 1960s, real wages have been highly procyclical in that period even though aggregate real wage data for the same period have not been nearly so procyclical.” Solon(1994)
- What is the nature of that illusion?



Composition Bias

The cyclical variation in the aggregate wage statistic consists of a weighted average of the cyclical wage changes experienced by workers of different skill levels

plus a second term reflecting the cyclical change in the skill composition of labour input.

If groups with low wages have pro-cyclical wage shares the latter term offsets the pro-cyclical movement of real wages for skilled employees who tend to stay in the labour market and whose wages rise as the economy heats up.



Returns to education

- What is the value in the labour market of an additional year of schooling? or another qualification?
- Cross-section estimates of returns to education
- Biased by failure to account for differences in ability?
- More able students will tend to acquire more years of schooling/qualifications



Cross-Sectional Specification of Returns to Education

$$w_i = \gamma X_i + \beta S_i + \varepsilon_i$$

- Does not account for:

- Observables

- *heterogeneous returns*

$$w_i = \gamma X_i + \beta_i S_i + \varepsilon_i$$

- *Non-observables*

- *ability bias*
- *returns bias*
- *measurement error bias*



Ability Bias

- If higher-ability or inherently more productive individuals tend to acquire more education, the unobserved disturbance term, ε_i will tend to be correlated with the observed amount of schooling, S_i , leading to *bias* in the estimate of the returns to education.

