

Unobserved Heterogeneity, Fixed Effects, and Causal Inference
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Thursday, April 24

10:30am - Noon

Non-experimental studies of panel data often attempt to remove the potentially biasing effects of individual heterogeneity through the inclusion of fixed effects. I evaluate "Value Added Models" (VAMs) that attempt to identify teachers' effects on student achievement. I develop falsification tests based on the assumption that teachers in later grades cannot have causal effects on students' test scores in earlier grades. A simple VAM like those used in the literature fails this test: 5th grade teachers have nearly as large effects on 4th grade gains as on 5th grade gains. This is direct evidence of non-random assignment. I use a correlated random effects model to generalize the test to more complex estimators that allow for tracking on the basis of students' permanent ability. The identifying restrictions of these estimators are again rejected. Teacher assignments respond dynamically to year-to-year fluctuations in students' achievement. I propose models of this process that permit identification. Estimated teacher effects are sensitive to model specification; estimators that are consistent in the presence of (some forms of) dynamic tracking yield very different assessments of teacher quality than those obtained from common VAMs. VAMs need further development and validation before they can support causal interpretations or policy applications.