Program Evaluation with Administrative Data: New Applications, Promise, and Challenges for Value-Added Models

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Introduction

• Partnership exploring ways to better exploit extant data to provide timely and rigorous evidence to help guide resource allocation decisions
• One possibility: can value-added models be applied to program evaluation?
• Goal is to explore tradeoffs of alternative methods – rigor vs. data/analytic requirements and ease of interpretation for end users
• Two datasets provide opportunity to examine suitability of method under different conditions

Data and methods

• Dataset 1: Intervention Tab data for 32,207 struggling students who participated in 29 vendor-provided math and 39 reading interventions in 2017-18
• Dataset 2: Investment Tracking System data for 20,928 students in 29 schools that had 47 interventions, mostly personnel, up for budgetary review
• Administrative data on student demographics and Fall 2017 & Spring 2018 NWEA MAP scores
• Preferred model regresses outcome on pre-score, student characteristics, and intervention variables
• Effect coding for Intervention Tab data as all students in dataset received intervention, so effects shown are relative to other interventions in dataset. Dummy coding for Investment Tracking data so effects are relative to students with similar pre-scores and demographics who received no intervention
• In Investment Tracking analysis, similar interventions across schools are grouped together and we include school fixed effects

Results

Interventions in Intervention Tab with n=10 and effects statistically significantly larger or smaller than average (standard deviation units; in parentheses). Results for Investment Tracking System analysis not shown due to concerns about selection bias, collinearity with school fixed effects, and unobserved treatments in comparison groups.

Reading

Math

*No statistically significant results

Conclusions

• Preliminary findings suggest model may be more promising under some conditions than others
  • Intervention Tab analysis more robust (results consistent with external evaluations (4 programs in WWC; 4 in Evidence for ESSA) and other methods) but only gives relative results
  • Investment Tracking analysis provides absolute estimates of effectiveness, but subject to confounding due to selection into interventions, collinearity of schoolwide interventions and school fixed effects, and unobserved interventions for comparison group

• Suggests method may be most usefuly applied with set of targeted interventions with a relatively similar group of students for which all or most interventions are observed
• Further study needed on specification, years of prior data, unobserved counterfactual programs
• Future work will test hypothesized optimal conditions for this method using simulated data and consider whether data collection and analysis work is worthwhile for a district

Further information

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References


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