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Does Teacher Value-Added Level the Playing Field? Evidence on the Confounding of Value-Added by Student Characteristics

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Background

❑ **States and school districts are now including student achievement growth or value-added modeling (VAM) in teacher evaluation systems**

❑ **Policymakers interested in VAM because it purports to "level the playing field" – value-added measures (VA) depend on what teachers do not on the students they teach**

❑ **Continuing concern that VAM does not live up to its billing and that teacher VA will be sensitive to which students a teacher teaches**

Questions

❑ **What do we know about VAM leveling the playing field?**

❑ **What more needs to be known on this issue?**

❑ **What cant be resolved by empirical evidence on this issue?**

❑ **How, and under what circumstances, does this issue impact the decisions and actions that districts can make on teacher evaluation?**

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How VAM Works

❑ **VAM uses statistical methods to isolate the contributions of teachers from other factors that influence student achievement**

❑ **Adjusts student achievement using individual student data**

  ■ **Prior scores on standardized tests, special education status, free and reduced price lunch or meal eligibility (FRL), and race and ethnicity**

❑ **May also adjust for the average prior test scores or averages of other student variables (e.g., FLR, or race) for the classroom or school, Census data, other school or classroom factors associated with student learning**

❑ **The exact set of control variables tend to vary across states and districts**

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What Is a Level Playing Field?

❑ **The playing field is level if there are no *persistent* and *systematic* characteristics of the students a teacher teaches that *consistently* lead VA to underestimate or overestimate her effectiveness**

❑ **If the playing field is not level, VA is *confounded***

❑ **VA is confounded if teachers who are equally effective have persistently different value-added scores because of the types of students they teach**

❑ **Confounding means we cannot determine the educators' contributions distinct from those of the students they teach**

❑ **Confounding means that student characteristics will conflate measures of teacher effectiveness in predictable ways**

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Persistent Vs. Chance Differences

❑ **VA cannot control for every factor that may influence a student's achievement test score**

❑ **Every class has its own idiosyncratic characteristics which contribute to the students' achievement**

❑ **Some years teachers will be assigned particularly challenging or productive classes**

❑ **These factors will all contribute to a teacher's VA in a given year**

❑ **But as long as they do not occur consistently, they do not confound VA**

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Is VA Confounded?

❑ **Simple value-added models that control for only one prior test score without any correction for the measurement error in the test and with or without student demographic variables are likely to be confounded**

❑ **Some studies of VA from more complex statistical models find evidence of confounding but others do not**

Evidence of Confounding, Study 1

❑ **In some schools differences among classes in the background characteristics of students are very small much like they would be if students were randomly assigned to classes; in other schools they are large**

❑ **If VA is confounded it should be more variable in schools with big difference among classrooms**

❑ **One study found examples the two kinds and found that VA was more variable in schools with large difference among classes**

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Evidence of Confounding, Study 2

❑ **Statistical theory shows that VA will not be confounded if certain assumptions hold**

❑ **If the assumptions do not hold then VA is likely to be confounded**

❑ **Several studies have tested the VA assumptions and find evidence that at least some of the assumptions are likely to be violated**

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Evidence of No Confounding, Study 1

❑ **Suppose we had a school with 3 teachers teaching grade 5, one with high VA, one with low VA, and one with average VA**

❑ **Suppose that the teacher with high VA leaves the school, then if VA is truly measuring effects on achievement, achievement should go down and by an amount that depends on VA**

❑ **One study used multiple years of VA from a large school district to test this hypothesis**

❑ **If found that the VA of teachers leaving schools was a very accurately predicted the changes in student achievement following their departure**

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Evidence of No Confounding, Study 2

❑ **If VA is accurately measuring the contributions of teachers then on average a student assigned to a teacher with VA of say 10 should have their achievement scores increase by 10 points**

❑ **If we randomly assign students to their teachers, we can estimate the true effect of the teacher on student achievement and it should equal the teacher's VA**

❑ **A research study conducted this experiment by randomly assigning classes to teachers within schools and comparing achievement gains after random assignment to the teachers VA from prior years when classes were assigned using standard procedures**

❑ **The study found VA closely assigned with gains after random assignment which would not be possible if VA was confounded by failure to control for important differences among classes**

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What more needs to be known on this issue?

❑ **Studies needs to be replicated**

❑ **Studies need to be conducted in high schools**

❑ **We need data on teaching conditions that are likely to result in large confounding even if for the majority of teachers and on average confounding is limited and contributes little to VA**

What can't be resolved by empirical evidence on this issue?

❑ **We can never fully rule out possible confounding for every teacher, but studies can suggest whether or not it is likely to exist across most teachers**

❑ **Measuring teachers' contributions distinct from the contributions of the students' peers, the schools, and the community is very challenging**

❑ **We cannot know the effectiveness of a teacher in all possible working conditions**

■ **Some teachers may be more effective with students from low-income than high-income families**

■ **But we can only measure teachers on the types of students they teach**

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How Does This Affect Decisions

❑ **The possibility of confounding suggests districts should guard against problems it could create**

■ **Could create misclassification of teachers that will be associated with different groups of students**

❑ **Districts might**

■ **Avoid very simple value-added models**

■ **Avoid comparing teachers teaching in very different situations**

■ **Study the relationship between value-added measures and student background variables**

❑ **A strong relationship between value-added measures and background variables could indicate confounding or disparity in teacher assignments**

■ **Compare changes in achievement in schools when teachers with high or low value-added depart from the school**

■ **Track achievement after introducing VA to see if it improves**

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