Issues in Value Added in Depth
Appendix NNN-3-3
September 26, 2011

Value Added Research Center
Madison Metropolitan School District
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Overview of value added

• Value added is the use of statistical technique to identify the effects of schools and classrooms on measured student knowledge
  – Knowledge typically measured with tests (WKCE)

• Focuses on growth of students in MMSD from one year to the next
  – More generally focuses on whether students perform better than predicted from available data
Overview of value added

• Schools receive value added measures
  – Equal to number of extra points on WKCE students at school scored relative to observably similar students across the district
  – Controls for prior knowledge, demographics
  – Positive value added means students scored higher than expected, negative less than expected
  – Overall, by grade, by subgroup
Strengths of value added

• Measures the contribution of schools and classrooms to measured student knowledge
  – School and grade levels
  – Differential effects by subgroup (disability, ELL, income, race)
  – Classroom level

• Feedback, accountability, improvement, resource allocation, evaluation
Strengths of value added

- Controls for prior knowledge of students
  - Key to value added
  - Acknowledges that what a student knows at a given point in time is not just the effect of the school he or she is currently attending, but influences experienced over a lifetime
  - Controls for those influences as best possible
  - Huge improvement over attainment-based approaches that focus on percent proficient
Strengths of value added

• Controls for measurable demographic differences across schools
  – Disability, ELL, gender, race, parent’s education, low-income status, FAY
  – Controls are informed by the data: control for ELL, for example, based on differences between ELL and non-ELL students across the district
  – Estimates from the data measures of gaps in performance between demographic groups
Strengths of value added

- Uses statistical technique
  - Also key to value added
  - Looks at the whole of data in a systematic, evenhanded, impartial way
  - Presents both a best estimate of a school’s value added as well as a 95 percent confidence range to account for randomness
  - Statistical techniques are quite sophisticated: shrinkage, measurement error, longitudinal data
Strengths of value added

• Can be applied in many different situations
  – WKCE (most common approach in Wisconsin)
  – Interim evaluations (such as MAP)
  – Generally, in cases where there are pretests to
    measure prior knowledge and posttests to measure
    current knowledge, and where there are enough
    schools to set a benchmark
  – Value-added and value-added-like models can be
    used in program evaluation
Strengths of value added

• Has yielded interesting insights about MMSD
  – Variation in value-added in Madison is small (especially compared to MPS, but also compared to the state as a whole), although there are sometimes outliers
  – Difference in student achievement across demographic groups, controlling for prior knowledge, other demographics, and schools attended
Strengths of value added

• Widespread usage across many districts
• Partners of VARC include:
  – New York City Department of Education
  – Los Angeles Unified School District
  – Chicago Public Schools
  – Milwaukee Public Schools
  – Hillsborough County Public Schools
Limitations of value added

- Value added relative to district average
  - Value added is equal to the number of extra WKCE points scored by students at a school relative to similar students across the district
  - MMSD is a small reference group: 29 elementary schools, 11 middle schools
  - And, as stated before, variance is small
Limitations of value added

• Value added relative to district average
  – VARC produces results for a statewide value-added model for Wisconsin
  – State of Wisconsin would provide a larger comparison group for MMSD schools and provide more context
  – Challenge is integrating the MMSD model into the statewide model to handle extra data we have in MMSD
Limitations of value added

• Value added measures are as good as the tests they are based on
  – Covers tested material, subjects, grades
  – Does not cover untested material, subjects, grades
  – November timing of WKCE a challenge
  – Value added should always be used in concert with other information about schools
Limitations of value added

• Value added measures are only as good as the whole of data they are based on
  – Sometimes, this means you need to understand the model to put its results into context
  – Example: Value added controls for ELL and low-income status, but the ELL and low-income students are sometimes a little different across schools
  – Use what you know to put results into context
  – But don’t use it to make excuses every time
Limitations of value added

- Value added measures require some work to interpret and use
  - Built from statistical models, so you need to think statistically when interpreting them
  - You don’t need to know how to build a car to drive one, but you still need to take driver’s ed
  - Administrative leadership
  - Professional development for value added
Limitations of value added

• Selection bias is possible
  – Recent literature on value added has focused on selection bias, especially at the classroom level
  – Do some classrooms get students who would have grown faster regardless?
  – Study of classroom assignment: how are students assigned to classrooms?
Limitations of value added

• Drawing inferences from small samples
  – Not much of an issue at the school level, since the schools in MMSD are quite large
  – More so at the classroom level
  – We measure value added at both levels as multi-year averages for a large, informative sample
  – We always present confidence intervals so that we are clear about the extent to which randomness can affect the value-added results
Wrap up

- Strengths of value added
  - Measures effects of schools and classrooms
  - Controls for prior knowledge, demographics
  - Measures gaps across demographic groups, controlling for other things we can measure
  - Uses statistical technique to best use data
  - Adaptable to different cases
  - Increasing usage among districts in the U.S.
Wrap up

• Challenges facing value added
  – Measured relative to district average; integrate with state model for Wisconsin
  – Some knowledge needed to interpret; central office guidance and professional development
  – Only as informative as the underlying data; interpret in context
  – Statistical issues about selection, sample size; study selection, use multiple years of data