



**VARC**  
Value-Added Research Center

# 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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