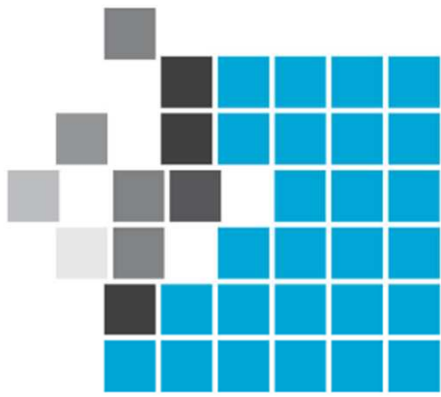




EDUCATIONAL VALUE-ADDED

Tomasz Żółtak
Educational Research Institute
Warsaw Poland

Value-Added Indicators of School Effectiveness: The Limits of Interpretation

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Presentation overview

1. Various uses of value-added measures of school *effectiveness*.
2. Assumptions underlying value-added models.
3. Are those assumptions plausible?
4. Conclusions.



Various uses of value-added measures

1. A tool to assist teacher assignments to students.
2. Part of the external evaluation system.
3. Support for parents when choosing a school.
4. A tool for self-evaluation for schools / teachers.



Different possible use of value-added measures

1. A tool to assist teacher assignments to students.

Rarely considered and rather controversial - appears as a recommendation in early Sanders' papers:

In fairness to children of all achievement levels, teacher assignment sequences should be determined to insure that no child is assigned to a teacher sequence that will be unduly hurtful to his or her academic achievement. (...) Even within the context of current teacher resources, administrators should insure that no student is assigned to a very ineffective teacher more than once, and even then insure that each student so assigned, has a highly effective teacher before and after.

(Sanders & Rivers, 1996)

2. Part of the external evaluation system.

3. Support for parents when choosing a school.

4. A tool for self-evaluation for schools / teachers.



Different possible use of value-added measures

1. A tool to assist teacher assignments to students.
2. Part of the external evaluation system.

Probably most common use.

Intuitively, the value added approach holds a school accountable for how much children learn while under the care of that school.

(Reardon, Raudenbush, 2009)

In USA sometimes value-added measures are used as an element of „merit pay” systems.

3. Support for parents when choosing a school.
4. A tool for self-evaluation for schools / teachers.



Different possible use of value-added measures

1. A tool to assist teacher assignments to students.
2. Part of the external evaluation system.
3. Support for parents when choosing a school.

Very strongly emphasized in England – value-added measures as an element of „school league tables”.

(Worth noting: removal of contextual value added measures from RAISEonline two years ago)

4. A tool for self-evaluation for schools / teachers.



Different possible use of value-added measures

1. A tool to assist teacher assignments to students.
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Promoted as main use of value-added indicators in Poland.

To be useful, requires tools that allow analyses at a within-school level and calculation of measures for user-defined groups of students.

- The main purpose is to compare value-added measures between different groups within the same school.
- It introduces some methodological (statistical) problems – for example it is hard to use BLUPs to compute measures in such case.



Assumptions underlying value-added models

1. A value-added model properly controls important factors affecting students achievements:
 - A. Only individual level factors – Raudenbush & Willms 1995 „type A”.
 - B. Both individual level and group level (compositional) factors – Raudenbush & Willms 1995 „type B”.
2. Effects of schools / teachers are invariant as a function of student background.
3. Effects of schools / teachers are (quite) stable over time.
4. There exists no (non-random) selection process regarding assignment of students to schools / teachers. Student background is uncorrelated with odds of assignment to a school with high / low *effectiveness*.



Various uses – different assumptions

use	assumptions		
	type of effect	invariance of effect	time stability
teacher assignment	B	+	+
external evaluation	B	+ / -	-
school choice	A	+	+
self-evaluation	A	-	-

Random assignment:

Non-random assignment generally does not invalidate value-added measures but it introduces a downward bias in the variance of random effects resulting in *over-shrinkage* of value added measures. As a consequence it lowers the ability to distinguish between schools of low and high *effectiveness*.



Plausibility of assumptions

In a significant number of schools the effect invariance does not hold:

- Polish (non-contextual) value-added measures:
 - 17% - 20% of lower-secondary schools appear to have significantly different value-added for girls and for boys.
 - Pearson correlation between value-added for boys and for girls is about 0.75.
 - 15% - 20% of lower secondary schools appear to have significantly different value-added for students with prior achievements lower and higher than the mean.
 - Pearson correlation is about 0.65.



Plausibility of assumptions

Effects of schools are rather unstable over time:

- In England, at GCSE level correlations of **~0.55** for **contextual value-added school effects 4 years apart** have been found (Goldstein, 2008).
- In Poland at lower-secondary level correlations of **0.4 - 0.6** for **(non-contextual) value-added school effects 4 years apart** have been found.
- Goldstein (2008) has shown that correlations are lower for contextual value-added effects than for non-contextual ones.
- According to Goldstein (2008), when predicting several years into the future, uncertainty about *true effectiveness* grows more than three times, making almost all English schools indistinguishable from each other.



Plausibility of assumptions

Assignment of students to schools is generally not random:

- Formal selection based on prior achievement – different intensity at different stages and in different countries (school systems).
 - More intense at higher stages of education.
- Informal selection connected with structural socio-economic factors
 - Students in rural areas typically have lower prior achievements and less beneficial family and social background. Rural areas are also typically less attractive for good teachers as a place to live and work.



Plausibility of assumptions

Assignment of students to schools is generally not random:

- Widely known paper of Rothstein (2009).

With data from North Carolina he has found that teacher value-added models provide estimates of teacher effects on prior achievement that are nearly as large as the estimates of teacher effects on current achievement.
- Polish (non-contextual) value-added measures for lower-secondary schools are slightly correlated with prior achievements ($r = 0.14 - 0.30$).



Conclusions

Value-added measures are of very limited use for parents wanting to choose a school for their children:

1. Predictions of future performance based on value-added measures are very uncertain.
2. Uncertainty about the effect on specific student is additionally increased as in many schools the assumption of invariance of school effect does not hold.

For the same reasons using value-added to assist teacher assignments to students does not seem worth recommending.



Conclusions

Problems with using value-added measures in external evaluation are connected mainly with selectiveness.

1. In case of selectiveness – especially when it is high – contextual value-added models must be employed to estimate „type B” effects.
2. These models are often very complicated and must be very carefully specified. Validity of value-added measures rely on proper specification of the model.
3. But when models with many covariates are used, high selectiveness considerably reduces the ability to distinguish highly *effective* and low *effective* schools.

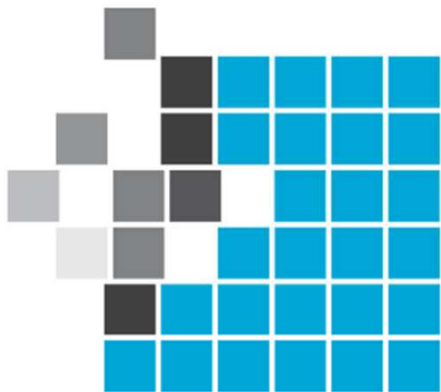
Value-added measures alone should not be used for making high-stakes decisions.



Conclusions

Self-evaluation of schools seems to be least problematic way of using value-added measures.

1. Using value-added measures for self-evaluation is rather demanding from schools in terms of data management and analytical skills.
2. With measures for the whole stage of education we can see what we have done with students who just left our school. It would be more useful to have measures for each grade.
3. Will it be a way to improve schools?



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Thank you for your attention!

t.zoltak@ibe.edu.pl

<http://gimnazjum.ewd.edu.pl/?jezyk=en>

<http://matura.ewd.edu.pl/?jezyk=en>

Educational Research Institute

Górczewska 8, 01-180 Warszawa

Poland

tel.: +48 22 241 71 00, e-mail: ewd@ewd.edu.pl



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