Grades 8 and 9 Algebra I EOC 2012-13 Results

September 2013
Presentation Overview

- Model overview
- Input data
- Model results
  - R-squared, variance components, precision and distribution of value-added scores
- Impact results
  - Correlations between value-added scores and class characteristics
Model Background
Model Overview

- SGIC approved grade 9 model for use in 2012-13
- Models estimated separately for grade 8 and grade 9
- The school component is estimated in the model, but none of the school component is added to the teacher component to create the final teacher score
- Only FCAT 2.0 scores are used in the model—FCAT scores are not used
Algebra 1 EOC Model Covariates

- Algebra I EOC models have student-level and classroom-level covariates

- Ideally, predictor variables should have the following properties:
  - A high statistical correlation with the outcome
  - A high curricular relationship with the outcome
  - A correlation with factors that contribute to student learning but are not in the control of teachers and schools
  - A high correlation with the unobservable processes by which students are sorted into schools and classes
Algebra I EOC Model
Student-Level Covariates

- Up to two prior FCAT 2.0 math scores
- English Language Learner (ELL) status (time as ELL)
- Students with Disabilities (SWD) status
- Gifted status
- Difference from modal age in grade
- Mobility (number of transitions)
- Attendance
Class size
Homogeneity of entering test scores in the class
Percent gifted in class (not in FCAT models)
Percent at modal grade (not in FCAT models)
Mean prior test score in class (not in FCAT models)
Input Data
Grade 8 students must have a prior grade 7 FCAT 2.0 math score.
Grade 8 model also controls for grade 6 FCAT 2.0 score.
Grade 9 students must have a prior grade 8 FCAT 2.0 math score.
Grade 9 model also controls for grade 7 FCAT 2.0 score.

Number of students included in the models:
- Grade 8: 53,673
- Grade 9: 99,717
Distribution of Algebra I EOC Scores: 9th Graders
Distribution of Algebra I EOC Scores: 8th Graders
Distribution of Prior FCAT 2.0 Math Scores

Box plots showing the distribution of FCAT 2.0 Math Scores for different grades:

- FCAT 8 (9th Graders)
- FCAT 7 (9th Graders)
- FCAT 7 (8th Graders)
- FCAT 6 (8th Graders)
Algebra I Score and Prior Grade 7 FCAT 2.0 Math Score (Correlation = 0.68)
Algebra I Score and Prior Grade 8 FCAT 2.0 Math Score (Correlation = 0.70)
Model Results
R-squared is one measure of model fit.

- Grade 8 R-squared (2012-13): 0.50
- Grade 9 R-squared (2012-13): 0.51
- Grade 8 R-squared (2011-12): 0.52
- Grade 9 R-squared (2011-12): 0.51

Share of teacher VAM scores significantly different from zero (95% confidence interval):

- Grade 8 (2012-13): 10.2%
- Grade 9 (2012-13): 9.8%
- Grade 8 (2011-12): 6.4%
- Grade 9 (2011-12): 11.8%
The next slide shows the standard deviations of the student, teacher, and school components.

The student component is typically expected to have more variability than the teacher component.

The teacher component is typically expected to have more variability than the school component.

In the 2012-13 grade 8 model, the variance of the school component is nearly as large as the variance of the teacher component.
Standard Deviations of Model Components

- Grade 8 (2011-12)
- Grade 8 (2012-13)
- Grade 9 (2011-12)
- Grade 9 (2012-13)

Y-axis: Standard Deviation

Legend:
- Student
- Teacher
- School
2012-13 Distribution of Algebra I Teacher VAM Scores by Grade
Model Impact Results
Observed Correlations of Mean Prior Score and %ED in Class with Algebra I Teacher VAM Scores

Grade 8

Grade 9

Mean Prior

%ED
Observed Correlations of %SWD and %ELL in Class with Algebra I Teacher VAM Scores

Grade 8

Grade 9

%SWD

%ELL
Observed Correlations of %Gifted and %Non-White in Class with Algebra I Teacher VAM Scores

Grade 8

Grade 9

%Gifted

%Non-White
### Observed Correlations with Algebra I Teacher VAM Scores

<table>
<thead>
<tr>
<th>Grade 8 (2012-13)</th>
<th>Mean Prior</th>
<th>%ED</th>
<th>%SWD</th>
<th>%ELL</th>
<th>%Gifted</th>
<th>%Non-White</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.13</td>
<td>-0.14</td>
<td>-0.05</td>
<td>-0.00</td>
<td>0.03</td>
<td>-0.03</td>
</tr>
<tr>
<td>Grade 8 (2011-12)</td>
<td>0.20</td>
<td>-0.17</td>
<td>-0.04</td>
<td>-0.04</td>
<td>0.06</td>
<td>-0.05</td>
</tr>
<tr>
<td>Grade 9 (2012-13)</td>
<td>0.06</td>
<td>-0.04</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.05</td>
<td>-0.00</td>
</tr>
<tr>
<td>Grade 9 (2011-12)</td>
<td>0.02</td>
<td>-0.10</td>
<td>-0.04</td>
<td>0.02</td>
<td>0.06</td>
<td>-0.02</td>
</tr>
</tbody>
</table>
Models estimated separately for grades 8 and 9.

In grade 8 model, Algebra I EOC score is predicted using FCAT 2.0 math 7 and math 6 scores and student and classroom characteristics.

In grade 9 model, Algebra I EOC score is predicted using FCAT 2.0 math 8 and math 7 scores and student and classroom characteristics.

Correlation between outcome and prior scores is lower in the Algebra I EOC models than in the FCAT models.

As a result, R-squared of Algebra I EOC models (~.50 in both grade 8 and 9) is lower than R-squared of FCAT models (typically around .7).
Some differences in impact data between grade 8 and grade 9 models:

- In grade 8, correlation between teacher score and mean prior score is 0.13. In grade 9, correlation between teacher score and mean prior score is 0.06.
- In grade 8, correlation between teacher score and percent economically disadvantaged is -0.14. In grade 9, correlation between teacher score and percent economically disadvantaged is -0.04.
Contact Information

Harold Doran
202-403-5035
hdoran@air.org

Eric Larsen
650-843-8260
slarsen@air.org