2018 Beating the Odds

Technical Overview

Data Sources

The *Beating the Odds (BTO)* analysis uses data from the Georgia Department of Education's (GaDOE) College and Career Ready Performance Index (CCRPI) and Student Record, and the Governor's Office of Student Achievement's (GOSA) Report Card. Data are matched using the unique concatenation of system ID and school ID variables.

The primary outcome variable of the *Beating the Odds* model is the CCRPI Single Score, which comes from GaDOE's Accountability Division.[1]

The enrollment number represents the number of K-12 students enrolled at the school during the October Full-Time Equivalent (FTE) count. This information is from GOSA's Report Card, as provided by GaDOE.

Grade cluster indicators are generated according to whether a particular grade cluster has a CCRPI score. Schools are classified into one of the following grade clusters: elementary only, elementary & middle, middle only, middle & high, high only, and elementary, middle, & high. The elementary only cluster serves as the reference category.

The churn rate is calculated by GOSA, based on data from GaDOE's Student Record. The churn rate measures the number of student entries and exits from the October FTE count date to May 1 divided by the number of students in the school on the October FTE count date. Students who withdrew and reentered the same school within seven days are not counted as mobile.

Demographic information is from GOSA's Report Card, as provided by GaDOE, and includes information on students included in the October FTE count. BTO includes the percentage of students by race/ethnicity: Asian/Pacific Islander, Black, Hispanic, Multi-Racial, and White. The 2018 BTO model excludes the percentage of Native American students because it is not a significant predictor of the outcome, and very few schools have more than three percent Native American students.[2] The percentage of White students serves as the reference category. The model also includes the percentage of female students, the percentage of students with disability, the percentage of English Language Learners, and the percentage of directly certified students.[3]

The model includes an indicator for non-traditional schools, as defined by GOSA. Non-traditional schools exist for the distinct purpose of serving students with unique instructional needs that are not adequately addressed in a traditional classroom setting. Non-traditional schools are not open enrollment.

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[1] Residential Treatment Centers (RTCs), as defined by GaDOE, are excluded from the model.
[2] This variable was removed from the model at the recommendation of an external statistical expert. See the BTO Revised Model Technical Document for more information.
[3] Direct certification includes students who live in a family unit receiving SNAP (food stamp) benefits, live in a family unit receiving TANF benefits, or are identified as homeless, foster, or migrant.

2018 Beating the Odds Model Revisions

Beginning with the 2018 analysis, GOSA revised the Beating the Odds model based on feedback from school systems, the Georgia Department of Education, Georgia's Educator Effectiveness and Accountability Technical Advisory Committee, and an external statistical expert. For additional details on the revisions, a general overview of the revised model is available on the GOSA website, as well as the technical report written by the external statistical expert. A summary of the changes are as follows:

- Stratify the model by three size groups, based on FTE counts.
- Include the percentage of female students.
- Remove the percentage of Native American students.
- Only use Direct Certification as the economically disadvantaged indicator.
- Include quadratic and cubic terms of predictor variables.
- Include an indicator for non-traditional schools.
- Use standard deviation of the forecast, rather than standard deviation of the predictor.
- Use half a standard deviation in constructing the BTO confidence interval.
- Expand the BTO tiers from 2 to 3.

Analytical Technique

Beating the Odds is estimated through the regression model below.

$$Y_i = \beta_0 + \beta_1 Female + \beta_2 Female^2 + \beta_3 Female^3 + \beta_4 Asian + \beta_5 Asian^2 + \beta_6 Asian^3 + \beta_7 Hispanic + \beta_8 Hispanic^2 + \beta_9 Hispanic^3 + \beta_{10} Multi\text{-Racial} + \beta_{11} Multi\text{-Racial}^2 + \beta_{12} Multi\text{-Racial}^3 + \beta_{13} DirectCertification + \beta_{14} DirectCertification^2 + \beta_{15} DirectCertification^3 + \beta_{16} ELL + \beta_{17} ELL^2 + \beta_{18} ELL^3 + \beta_{19} SWD + \beta_{20} SWD^2 + \beta_{21} SWD^3 + \beta_{22} Churn + \beta_{23} Churn^2 + \beta_{24} Churn^3 + \beta_{25} EM + \beta_{26} EMH + \beta_{27} H + \beta_{28} M + \beta_{29} MH + \beta_{30} NonTraditional + \epsilon_i$$

Estimation & Post-estimation Strategy

BTO uses the model above to calculate the predicted CCRPI Single score. The model is run separately by three size groups based on FTE enrollment counts: small (0-500 students), medium (501-1,000 students), and large (+1,000 students). To determine each school's BTO tier:

1. Compile the data necessary to run the model, as outlined above.
2. Generate a quadratic and cubic version of each percentage variable.
3. Sort the schools by size using the FTE enrollment counts: small (0-500 students), medium (501-1,000 students), and large (+1,000 students).
4. Run the model separately by these three school sizes, in order to generate the predicted scores and the standard deviation of the forecast for each school.
5. Calculate the upper bound of the confidence interval by adding half of the predicted standard deviation to the predicted score.
6. Calculate the lower bound of the confidence interval by subtracting half of the predicted standard deviation from the predicted score.

Schools then receive one of the three following designations for each model:

1. Beat the Odds: If a school's actual CCRPI single score is greater than the upper bound of the confidence interval.
2. Within Expected Range: If a school's actual CCRPI score is less than or equal to the upper bound of the confidence interval, but greater than the lower bound of the confidence interval.
3. Below Expected Range: If a school's actual CCRPI score is less than or equal to the lower bound of the confidence interval.