



Performance and Funding

This brief provides the study team’s analytical findings on the following research questions:

1. What is the relationship between funding and student academic performance?

Methodology

The study team examined student-level demographic and expenditure data and used this examination as the basis for its descriptive analysis, which assessed differences in school characteristics by per-pupil funding levels.¹ In addition, the team conducted two additional analyses: an ordinal logistic regression (OLR) and a least absolute shrinkage selection operator (LASSO).² The team used the OLR analysis to study the relationship between per-pupil funding and performance on the statewide assessment—the ACT Aspire.³ The team used a LASSO analysis to examine the relationship between per-pupil funding and student scaled scores in math and ELA to verify results.⁴

Summary of Key Findings

First, the team’s descriptive analysis showed that the *median* per-pupil expenditure rate in the state was \$9,483 per student while the *mean* was \$10,160. The difference between the *median* and the *mean* suggested the average per-pupil expenditure rate was pulled up by students funded at higher per-pupil amounts. The spending interquartile range was from \$8,425 to \$11,013, indicating that half of all Arkansas students were funded within this range.⁵ The team also observed that as per-pupil spending increased, school demographic characteristics changed as well. Overall, the findings revealed that schools with more low-income students, SPED, LEP, and underrepresented minority students expended more per-pupil.

Second, the team’s descriptive analysis of ACT Aspire performance at the student level suggested that students funded at higher rates performed similarly to students funded at lower rates. As such, this part of the analysis implied that performance was negligibly impacted by spending differences. The OLR approach showed that irrespective of funding level, students had a similar probability of achieving proficiency. The LASSO approach demonstrated similar results, showing that students who received more per-pupil, did not achieve higher scaled scores for

¹ The data was provided by the Arkansas Department of Education, the MyADE site, or the Office of Education Policy at the University of Arkansas. Performance data is from the 2019 academic year and expenditure data is from the 2018 academic year.

² Observational analyses describe a category statistical procedures that rely on empirical data to make inferences about populations or relationships often controlling for other factors. They are not causal analyses.

³ Ordinal logistic regression is a regression technique appropriate when an outcome is categorical and reflects an underlying or natural ordering. It is an extension of logistic regression.

⁴ The Least Absolute Shrinkage Operator (LASSO) is a machine learning technique that utilizes penalized regression to iteratively select the most influential covariates while shrinking the unneeded covariate coefficients to zero.

⁵ The interquartile range represents 50% of a distribution and encompasses observations from the 25th to the 75th percentile.

math and ELA, even when controlling for background characteristics. In tandem, these findings suggested that while high need students received more per-pupil, (i) the current amount of additional funding provided has not resulted in large gains in performance for disadvantaged students, and (ii) the amount of additional funds provided to at-risk students had not yet equated to increased performance.