



EVALUATION OF THE EFFECT OF TENNESSEE'S ACHIEVEMENT SCHOOL DISTRICT ON STUDENT TEST SCORES

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A number of states and districts have adopted bold strategies for turning around low performing schools. Some of these initiatives have been modeled after Louisiana's Recovery School District (RSD), which, in some cases, took over and directly ran failing schools or, in other cases, turned these schools over to charter management organizations (CMOs). Inspired by Louisiana's example and the potential of Race to the Top (RTTT) funding, Tennessee passed legislation called First to the Top in January 2010 which created the Achievement School District (ASD). With this legislation in hand, the state applied for RTTT funding, and, in March of that year, Tennessee was awarded \$500 million to carry out the proposed initiatives including the ASD.

The First to the Top legislation called for the State Commissioner of Education to identify the state's lowest-achieving five percent of Title I schools. These

KEY FINDINGS

1. Overall, Priority schools have small positive effects in Math and Science.
2. Overall, iZone schools have moderate to large positive effects in Reading, Math and Science with strong consistent effects across subjects for Memphis iZone schools.
3. Overall, ASD schools did not gain more or less than other Priority schools that were not in an iZone.
4. Cohort 2 ASD schools have large negative effects in Math in Year 1 but gains in Math in Year 2, particularly in ASD-run schools, that partially offset the prior year's losses.
5. Cohort 1 ASD-run schools have moderate positive effects in Math in Year 3. In addition, Cohort 3 ASD schools, which are all CMO-run, have moderate negative effects in science.

schools, known as priority schools, would then face one of four interventions: (1) placement in the ASD; (2) turnaround under the auspices of an LEA innovation zone (also known as iZone schools); (3) turnaround through one of the federal School Improvement Grant (SIG) plans; or (4) LEA-led school improvement planning processes (ESEA Flexibility Request, 2012, p. 54). Among these possible interventions, none has been bolder and, consequently, more controversial than the ASD – a new state-run school district that removes schools from their home districts and either directly manages these schools or contracts management responsibilities to a CMO partner. The ultimate goal of the ASD is to move the academic performance of schools taken over from the bottom

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As initially conceived by the original First to the Top

legislation, once a school is selected for the ASD, the school would remain in the ASD for at least five years. The school would return to the home district conditional on the performance of both the school and the home district (ESEA Flexibility Request, 2012). While the application did not dismiss the possibility of the state solely operating ASD schools, the emphasis was on a hybrid model where both the state and partnering CMOs take over and manage the ASD schools. The overarching strategy to improve student outcomes at schools taken over by the ASD and managed by the state or a CMO was to provide autonomy to schools including the ability to hire talented education professionals, especially teachers (Race to the Top Application for Initial Funding, 2010). It is important to point out that while CMOs were being tapped to run schools, the schools remained neighborhood schools rather than the more typical charter schools run by these organizations in which parents and students must apply to attend.

In 2012-13, the ASD took over the first cohort of six schools with three schools run by CMOs and three run directly by the ASD. In 2013-14, the ASD added a second cohort of 11 schools, eight run by CMOs and three run directly by ASD. Finally, in the 2014-15 school year, a third cohort of eight schools were added, all CMO-run, while two schools opened in the 2013-14 school year were merged in with other ASD

schools. By the 2013-14 school year, 23 schools were operating under the auspices of ASD with five managed directly by the ASD and 18 managed by CMOs.

In a previous research brief entitled “Teacher and Student Migration In and Out of Tennessee’s Achievement School District,” we examined student and teacher mobility (Henry et. el., 2014). Overall, we found that the vast majority of teachers exited schools once they came under the auspices of the ASD. Therefore the ASD faced a significant need to hire new teachers in their first year of operation. Among the new hires, nearly a third were novice teachers. Of those with teaching experience in Tennessee, the ASD hired more high performing teachers, in terms of value-added scores, as compared to the teachers that left before the ASD takeover. In terms of student mobility, we found that ASD had a high rate of student mobility into their schools in the first year of takeover, but the rates declined with each subsequent year. In examining the students that move in and out, the proficiency levels of students transferring into ASD schools had little effect on the overall proficiency rates of ASD schools.

In this current research brief, we expand our examination to focus on student test score outcomes by not only examining the effects ASD is having on student test scores, but also the effects iZone schools are having as well as the overall effects of being identified as a priority school on student achievement.

DATA

To address each of the research questions listed above, we utilize a database provided by the Tennessee Department of Education and compiled by the Tennessee Consortium for Research, Evaluation and Development. The database includes student-level data, including demographic characteristics, both TCAP and EOC test scores¹, and school enrollment data from 2009-10 through 2014-15 school years. For the analysis, we use reading, math, and science scale scores and convert these to standardized units by subject, grade, year, and, for EOCs, semester to have a common metric across grades and years.²

RESEARCH APPROACH

To conduct the analysis, we use a pre-post assessment called a difference-in-differences approach in which we examine student performance in schools prior to “treatment” (i.e., priority, iZone, ASD schools) relative to student performance in these same schools after treatment and examine whether

the differences in the pre- and post-treatment performance is larger or smaller than the differences in performance of students in a set of similarly low-performing schools over the same time horizon.^{3,4}

For each type of school reform, we present the overall results for reading, math, and science. For iZone schools, we further break down the analysis by city. Finally, for ASD schools, we break down the performance further by cohort of schools, academic years, and the management structure (i.e., ASD-managed and CMO-managed).

Finally, we should note that because we use an approach that requires us to observe the performance of schools both before and after treatment, we exclude any school where we did not have pre-treatment test scores for students. In addition, we also exclude any school that did not have tested grades in the relevant school years. In Table 1, we highlight the total number of schools for each treatment and the number of schools included in our analysis by year.

¹ The Tennessee Comprehensive Assessment Program (TCAP) is the statewide assessment for students in grades 3 to 8. End of Course (EOC) tests are statewide course-specific assessments, primarily given at the high school level (some students may take EOCs in middle school).

² We use standardized scores instead of proficiency rates because proficiency rates limit the analysis to a narrow range of scores near the proficiency cutoff. By using standardized scores, we utilize the entire range of scores in the analysis and can observe effects regardless of its proximity to the proficiency cutoff.

³ For the analysis of priority schools, we use schools that are in the lowest five to 10 percent as the comparison schools. For the analysis of ASD schools, we used all other non-iZone priority schools. For the analysis of iZone schools, we used all other non-ASD priority schools as the comparison schools.

⁴ One standard check for the validity of the difference-in-differences approach is to see whether there are differential gains of students in “treatment” condition relative to control condition prior to implementation of the treatment. To employ this validity check, we examined whether students in the treatment schools (i.e., priority, ASD, or iZone) had differential gains one year prior to treatment relative to earlier years and whether these gains were different from the control schools. This check not only serves as a “falsification test” of the estimates from the research design, it also is a possible check to see whether there was a demoralizing effect for schools being placed in the ASD as the announcement of takeover by ASD occurred in the year prior to treatment. From the analysis, we observed no statistically significant effect (positive or negative) in the year directly before treatment, which provides support for our research design and minimizes concerns of a demoralizing effect.

TABLE 1: NUMBER OF SCHOOLS BY REFORM APPROACH

Year	Total Priority	Non-iZone, Non-ASD Priority	iZone	ASD Schools in Operation			ASD Schools Included in Analysis		
				ASD-Run	CMO-Run	Total	ASD-Run	CMO-Run	Total
2012-13	82	65	11	3	3	6	3	3	6
2013-14	84 ⁵	45	22	6	11	17	5	6	11
2014-15	77 ⁶	28	26	5	18	23	5	11	16

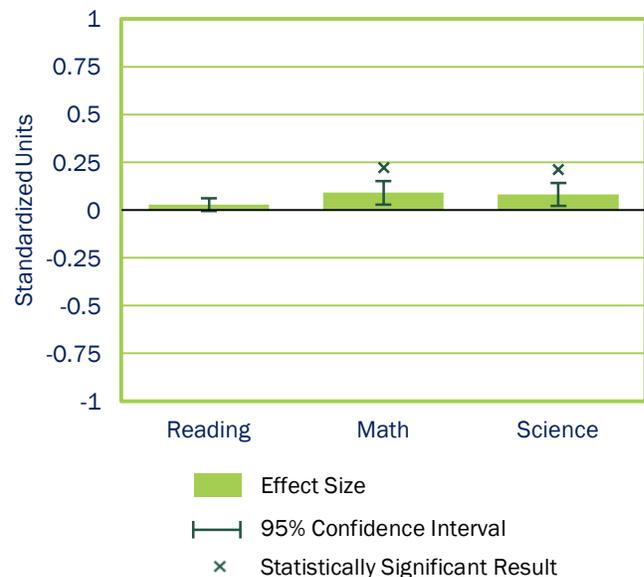
RESULTS

Priority Schools

As a reminder, the official list of Priority schools was announced in the summer of 2012 and included schools scoring in the lowest 5 percent of all schools in the state, based on performance in the 2009-10, 2010-11, and 2011-12 school years. After being identified as a low-performing school, the school could become part of an iZone, the ASD, close, or remain under the auspices of their local school district.⁷ However, in many cases, these schools initially received limited reforms and primarily just received the designation of being a low-performing school.

Later, we present the results for schools assigned as iZone or ASD schools, but we first show the overall effect of priority schools on test score gains in figure

FIGURE 1: ESTIMATED EFFECT OF PRIORITY SCHOOLS



Note: All figures include both the estimate of the effect as well as a 95 percent confidence interval. If the confidence interval does not cross zero, then we interpret the estimate as statistically different from zero. In the figure, we use “x” to indicate statistical significance.

⁵ The increase in the total number of Priority schools from 2012-13 to 2013-14 comes from the addition of four new ASD schools, the splitting of one school into two separate schools by the ASD, and the closure of three Priority schools.

⁶ The decrease in the total number of Priority schools from 2013-14 to 2014-15 comes from the addition of two new ASD schools, the creation of a second school at a former school the ASD took over in 2012-13, the merging of two ASD schools into other ASD schools, and the closure of eight other Priority schools.

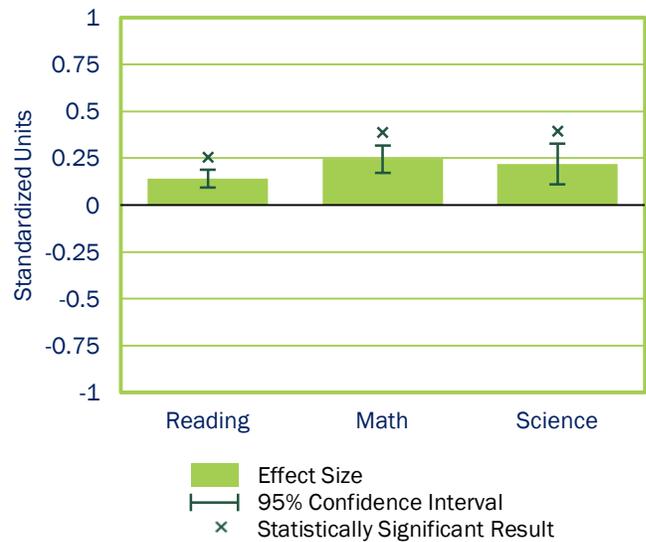
⁷ Originally, Priority schools could also apply for and receive a School Improvement Grant (SIG) to implement a federally-approved school reform model. However, post hoc events show that SIGs distributed that year went to ASD and iZone schools.

1, which displays the results for reading, math, and science. In the figure, the estimates are shown as proportions of a standardized unit of standard deviations. To give context and help interpret this metric, the average difference between the cutoffs for basic and proficient achievement levels on the TCAP in the 2013-14 school year was 1.28 standardized units in reading, 1.19 in math, and 1.24 in science.⁸ With these magnitudes as context, our results for the priority schools suggest that these schools are having a small, but positive and statistically significant effect on test scores in math and science. We find no statistically significant effect on reading.

iZone Schools

iZone schools are priority schools that remain under the control of the local school district, but are given greater autonomy to implement reforms in hopes of improving performance. Figure 2 displays the results for iZone schools, which suggests that iZone schools

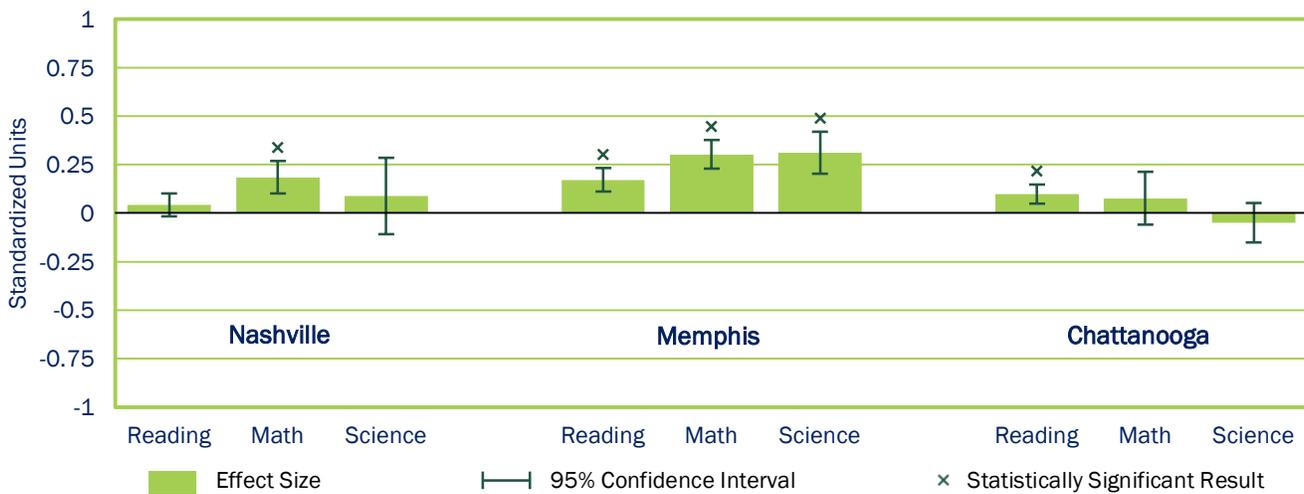
FIGURE 2: ESTIMATED EFFECT OF IZONE SCHOOLS



are having positive, statistically significant, and substantively meaningful effects on student achievement across all subjects.

In Figure 3, we present the results for iZone schools by the three locations in which iZones currently

FIGURE 3: ESTIMATED EFFECT OF IZONE SCHOOLS BY LOCATION



⁸ Students can score on one of four levels of each TCAP assessment – below basic, basic, proficient, or advanced. The cutoff for basic is between below basic and basic; the cutoff for proficient is between basic and proficient.

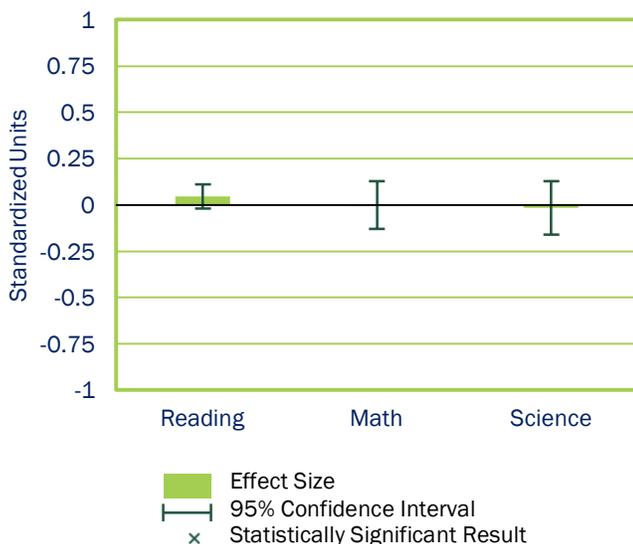
operate: Nashville, Memphis, and Chattanooga. Here, there is a reduced ability to detect statistically significant effects because we have fewer schools when disaggregating the analysis by location. Nevertheless, we do find at least some evidence of positive effects in each location with statistically significant effects in math in Nashville, reading in Chattanooga, and all three subjects in Memphis. In the case of Memphis, the effects are large in math and science.

ASD Schools

As a reminder, ASD schools are priority schools under the auspices of the state ASD, either directly managed by the ASD or by CMOs. Figure 4 displays the results for reading, math, and science. Overall, ASD schools did not gain more or less than other Priority schools that were not in an iZone.

In figure 5, we display the results for math and science by cohort and academic year (we do not show reading

FIGURE 4: ESTIMATED EFFECT OF ASD SCHOOLS



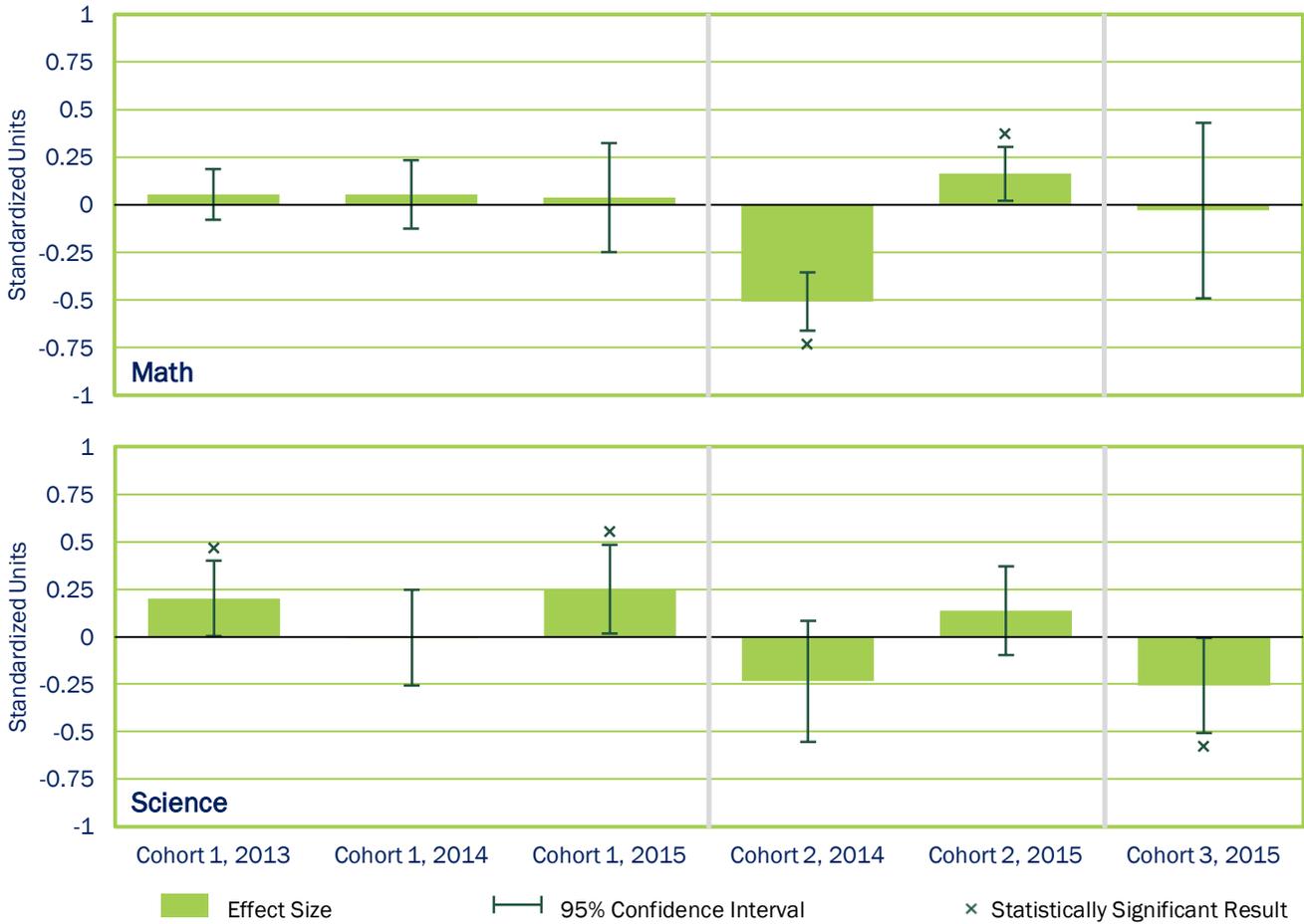
... iZone schools are having positive, statistically significant, and substantively meaningful effects on student achievement across all subjects ... In the case of Memphis, the effects are large in math and science.

as no estimate is statistically significant). It should be noted that these results build off previous estimates over time. For instance, our results in science suggest a positive effect on the performance of students in the first cohort of ASD schools in 2014-15 school year. This would be above and beyond the change in performance students in these schools had experienced in prior years. It should also be noted that similar to the results for iZone schools by location, we lose some ability to detect statistically significant results when we break down the schools into categories.

For cohort 1, the math estimates are small and statistically insignificant. In contrast, cohort 2 schools have a large and statistically significant negative effect in the 2013-14 school year. However, these schools partially rebound in the 2014-15 school year with a positive and statistically significant effect. We find no statistically significant effect in math in cohort 3 schools.

The science results vary considerably across cohorts and years. For cohort 1, we find a positive and moderate to large effect in the 2012-13 and 2014-15 school years, but not in the 2013-14 school year.

FIGURE 5: ESTIMATED EFFECT OF ASD SCHOOLS BY COHORT, BY ACADEMIC YEAR



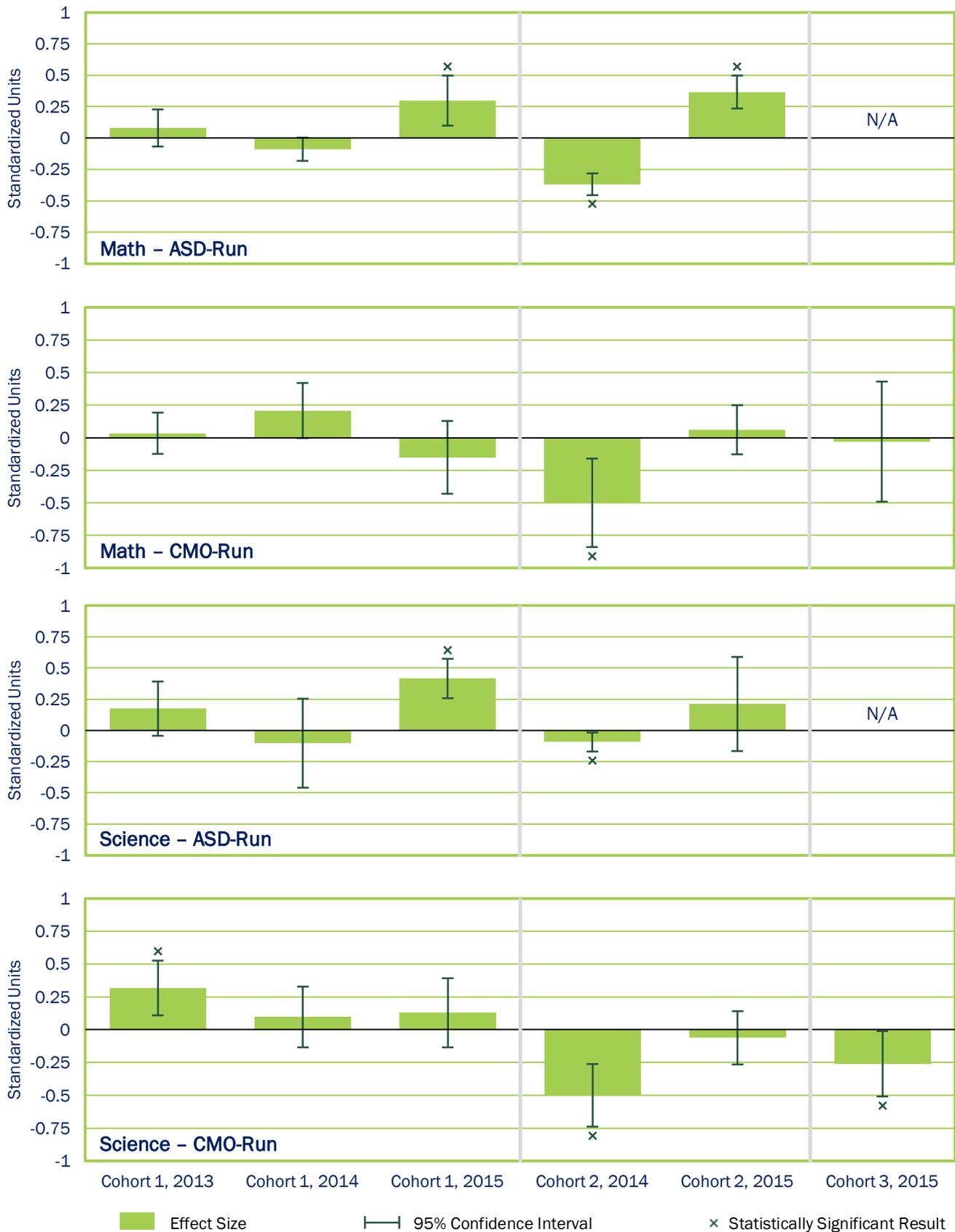
While the first year for cohort 2 appears to be negative and the second year positive, there are no statistically significant effects, possibly due to the limited sample size. Finally, for cohort 3, we find a statistically significant and large negative effect in the 2014-15 school year.

Overall, the results in figure 5, coupled with the lack of any significant effects in reading, suggests that the performance of ASD schools has been inconsistent across school years, in most cases showing no difference from the comparison schools. To explore this further, we examine the math and science effects

not only by cohort and academic year, but also by management structure (i.e., ASD-run or CMO-run) in figure 6. (Again, we do not show the reading effect because we do not find any statistically significant effect.)

Across both figures, the results are a bit more positive for the ASD-managed schools as both cohort 1 and 2 ASD-managed schools had large, positive, statistically significant math effects in the 2014-15 school year. However, both ASD- and CMO-managed schools in cohort 2 had large, negative, statistically significant math effects in the 2013-14 school year. While ASD-

FIGURE 6: ESTIMATED EFFECT OF ASD BY COHORT, BY ACADEMIC YEAR, BY MANAGEMENT STRUCTURE



managed cohort 2 schools had a small and statistically significant negative effect in science in the 2013-14 school year, ASD-managed cohort 1 schools had a large and statistically significant positive effect in science in the 2014-15 school year. We also observed a large and statistically significant negative effect in science for CMO-managed cohort 2 schools in the 2013-14 school year and cohort 3 schools in the 2014-15 school year. In no case do we observe a positive and statistically significant effect in math or

Overall, the ASD results do appear to differ a bit across the management structures, but the ASD-managed schools show slightly more evidence of positive effects than the CMO-managed schools.

science for CMO-managed schools in the 2014-15 school year. However, we do observe a large, positive, statistically significant science effect for cohort 1 CMO-managed schools in the 2012-13 school year, but not for ASD-managed schools. Overall, the ASD results do appear to differ a bit across the management structures, but the ASD-managed schools show slightly more evidence of positive effects than the CMO-managed schools.

CONCLUSION

In 2010, with Race to the Top funding, Tennessee embarked on a bold plan to remove many of its lowest performing schools from the auspices of their local

school districts and place them in the state-run Achievement School District or district-run innovation zones known as iZones. By the end of the 2014-15 school year when federal Race to the Top funds ran out, 77 of the original 83 schools (94%) remained open and 49 (64%) had been placed under the ASD or special local districts.

While there were small positive effects in math and science across all the Priority schools, the overall effects in the 26 iZone schools were consistently positive across all subjects with positive effects in each of the three local districts that operated them. In several cases, the effects of iZone schools were moderate to large in magnitude. The effects in the ASD schools were mainly statistically insignificant and occasionally significant, sometimes positive (three times) and sometimes negative (two times) depending on the subject, cohort, and academic year.

Taking a positive perspective, the effects on test scores from priority schools indicates some overall progress in math and science achievement. In addition, we consistently find substantial, positive effects for iZone schools, especially in Memphis. Therefore, one could argue that the students in these schools are better off than they would have been without these reforms, especially students attending iZone schools in Memphis.

From a less positive perspective, 28 of the schools (36%) that were identified as the state's lowest performing in 2011 have not been included in either ASD or iZones. In addition, while the iZone schools have shown promising test score effects, the effect on test scores from priority schools as a whole and ASD schools, specifically, has been less than many advocates had hoped for. However, research

suggests that it may take three to five years for reforms to take hold (Berends, Bodilly, and Kirby, 2002). Therefore, some may consider it premature to pass definitive judgment on the ASD schools or priority

schools more generally as schools have been designated as priority schools for only three years and most of the ASD schools have been under the auspices of the ASD for less than three years.

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References

Berends, M., Bodilly, S., & Kirby, S. (2002). "Facing the Challenges of Whole-School Reform: New American Schools After a Decade," Santa Monica, CA: RAND Corporation, MR-1498-EDU, 2002. As of January 2, 2007: http://www.rand.org/pubs/monograph_reports/MR1498/

Henry, G., Zimmer, R., Attridge, J., Kho, A., & Viano, S. (2014). "Teacher and Student Migration In and Out of Tennessee's Achievement School District," Tennessee Consortium on Research, Evaluation, and Development, As of September 28, 2015: http://www.tnconsortium.org/data/files/gallery/ContentGallery/TCREDASDRpt_Zimmer_020915_Revised_022715.pdf

ESEA Flexibility Request. (2012). Submitted to the U.S. Department of Education.