



Rice University's Kinder Institute for Urban Research



HISD's Decentralization Reform (Part 3: Decentralization and Student Achievement)

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Converse College

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About HERC

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Summary

This brief provides evidence on the relationship between HISD’s decentralization reforms, which were fully implemented by the 1999–00 school year, and trends in student achievement. The effects of decentralization on pass rates on the Texas Assessment for Academic Skills (TAAS) were estimated by comparing trends in campus pass rates in HISD to pass rates in a matched set of schools across the state that did not experience decentralization over the same period.

Schools in HISD generally experienced modest gains in TAAS pass rates between 1996–97 and 2001–02. There is no evidence, however, that the gains over this period were attributable to the district’s decentralization efforts in the late 1990s and early 2000s. Specifically, decentralization was unrelated to TAAS pass rates in elementary, middle, or high schools, or in schools meeting HISD’s small school criteria. Decentralization was also not related to the TAAS pass rates of economically disadvantaged students, black students, or Hispanic students.

Key Findings

- ***Decentralization was not associated with increases in TAAS pass rates three years after the reforms were fully implemented.*** Although TAAS pass rates in HISD increased between 1999–2000 and 2001–2002, there is no evidence that the increases were because of decentralization. When compared to other schools with similar levels of achievement from 1996–97 to 1998–99, decentralization was not associated with any statistically significant increases in achievement between 1999–2000 and 2001–2002, beyond what would be expected if decentralization had not occurred.
- ***Decentralization was not associated with increases in TAAS pass rates for black students, Hispanic students, or economically disadvantaged students.*** There is no evidence that the TAAS pass rates of black students, Hispanic students, and economically disadvantaged students were affected by decentralization reform.
- ***Decentralization was not associated with increases in achievement among students in elementary schools, middle schools, or high schools.*** Analyses of the impact of decentralization by school characteristics do not reveal any significant differences by school level.
- ***Decentralization was not associated with changes in achievement for small schools.*** There is no evidence that TAAS pass rates in small schools were impacted by decentralization reform.

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Research Brief Abstract

HISD's Decentralization Reform (Part 3: Decentralization and Student Achievement)

This research brief is Part III of a four-part study of decentralization in HISD.

- Part I describes how decentralization was enacted in HISD.
- Part II reports HISD principal attitudes and satisfaction within the current decentralized model.
- **Part III examines the impact of decentralization on student outcomes.**
- Part IV examines the impact of decentralization on funding equity.

Introduction

In hopes of improving student performance, Houston ISD implemented decentralization throughout the 1990s (see Part I of this project for a detailed discussion of the reforms). In addition to giving principals more autonomy to develop staffing plans, class schedules, and teaching practices to cater to their students' unique needs, the reforms culminated with a change to the district's funding model from a full-time equivalency (FTE) model to a per unit allocation (PUA) model in the 1999–2000 school year. The PUA model placed more control of a school's budget in the hands of its principal. The goal of this study is to determine if the decentralization reforms, particularly the changeover to a PUA model, improved student achievement.

What this Study Examines

The primary objective of this brief is to provide evidence on the link between HISD's decentralization reforms and student achievement. Towards that end, TAAS pass rates were computed for all campuses in the state of Texas between 1996–97 and 2001–02—three years prior to and three years after HISD adopted the PUA-based funding model. To estimate the effect of decentralization, this study compared the change in pass rates (across all grades and all subjects) in HISD schools before and after decentralization was fully implemented in the district to a matched set of schools from across the state that did not experience decentralization over the same time period.

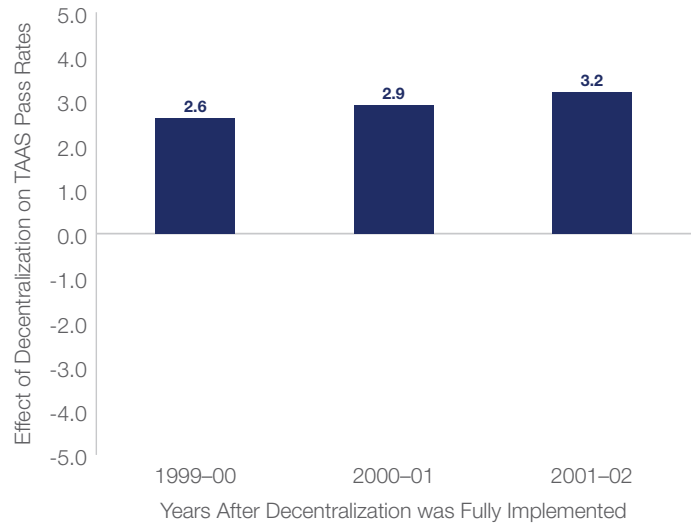
In addition to examining the overall relationship between decentralization and achievement, this study also attends to differences in the effect of decentralization by student-subgroup (black, Hispanic, and economically disadvantaged students), school level (elementary vs. middle vs. high) and school size (small schools).

What this Study Found

Key Finding #1: Decentralization was not associated with increases in TAAS pass rates three years after the reforms were fully implemented.

Figure 1 provides estimates of the impact of decentralization on HISD campus TAAS pass rates in the three years after decentralization was fully implemented (1999–2000, 2000–01, and 2001–02) by comparing pass rates in HISD to a set of campuses across the state that had nearly identical trends in TAAS pass rates in the three years before decentralization was fully implemented (1996–97, 1997–98, and 1998–99). The blue bars represent the difference in pass rates in HISD and non-HISD campuses in 1999–2000, 2000–01, and 2001–02. Positive values indicate that HISD had higher pass rates than similar non-HISD campuses, while negative values indicate that HISD had lower pass rates than similar non-HISD campuses. For example, Figure 1 demonstrates that in 1999–2000 HISD campuses had TAAS pass rates that were 2.6 percentage points higher than similar non-HISD campuses. Indeed, between 1999–2000 and 2001–02, pass rates in HISD were slightly higher than the TAAS pass rates in similar non-HISD campuses. Despite having slightly higher pass rates, however, these differences were not statistically significant (see Table 1). This suggests that decentralization did not have an effect on overall school performance in the three years after the implementation of the PUA-based funding model.

Figure 1. Overall Effect of Decentralization on TAAS Pass Rates in HISD, 1999–2000 through 2001–02.



Note. The bars represent the difference in the change in TAAS pass rates in HISD and non-HISD campuses in 1999–2000, 2000–01, and 2001–02. For example, one year after decentralization was fully implemented (1999–2000), overall TAAS pass rates in HISD were 2.6 percentage points higher than TAAS pass rates in the matched sample of non-HISD campuses. None of these differences are statistically significant (see Table 1), meaning there is no evidence that decentralization is responsible for the pass rate difference between HISD and non-HISD campuses.

Table 1. Effects of Decentralization on Overall Campus TAAS Pass Rates in HISD

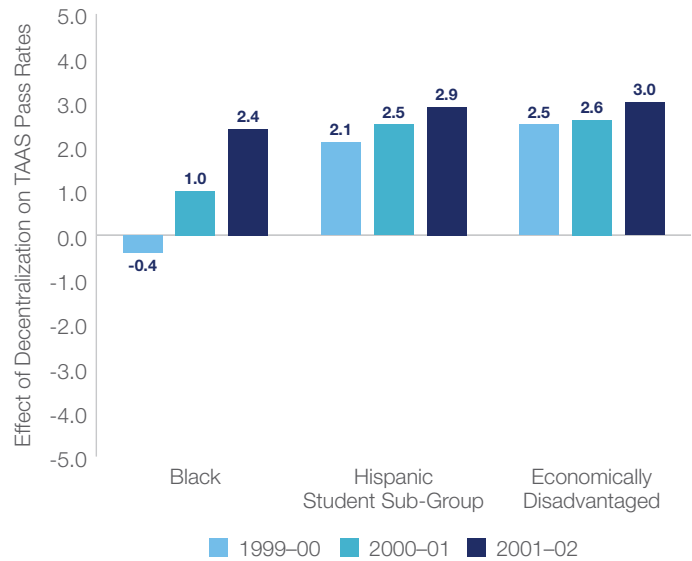
	Coef.	SE	Sig.
1999–00	2.63	2.11	0.21
2000–01	2.87	2.11	0.17
2001–02	3.22	2.11	0.13
<hr/>			
# of schools	4,656		

Note. Since the analysis was limited to campuses that existed for the entire 6-year study period, the number of campuses in 1999–00, 2000–01, and 2001–02 are identical. As such, the standard errors for each year are identical.

Key Finding #2: Decentralization was not associated with increases in TAAS pass rates for black students, Hispanic students, or economically disadvantaged students.

Similar to the prior findings for all students, decentralization was not associated with the TAAS pass rates of students of color or economically disadvantaged students. For instance, Figure 2 demonstrates that black students in HISD had nearly identical TAAS pass rates to black students in similar campuses across the state in the three years after HISD fully implemented decentralization reform. The effects of decentralization on Hispanic students and economically disadvantaged students exhibit a similar pattern. While Hispanic students and economically disadvantaged students in HISD had consistently higher scores than their peers in non-HISD campuses after decentralization was fully implemented, these differences were not statistically significant. See Table 2 for the regression estimates.

Figure 2. Effect of Decentralization on TAAS Pass Rates in HISD for Black, Hispanic, and Economically Disadvantaged Students, 1999–2000 through 2001–02.



Note. The bars represent the difference in the change in TAAS pass rates in HISD and non-HISD campuses in 1999–2000, 2000–01, and 2001–02 for black, Hispanic, and economically disadvantaged students. For example, one year after decentralization was fully implemented (1999–2000), the TAAS pass rates of black students in HISD were 0.4 percentage points lower than the TAAS pass rates of black students in the matched sample of non-HISD campuses. None of these differences are statistically significant (see Table 2), meaning there is no evidence that decentralization is responsible for the pass rate difference between HISD and non-HISD campuses for these sub-groups of students.

Table 2. Effects of Decentralization on Campus TAAS Pass Rates in HISD by Student Subgroup

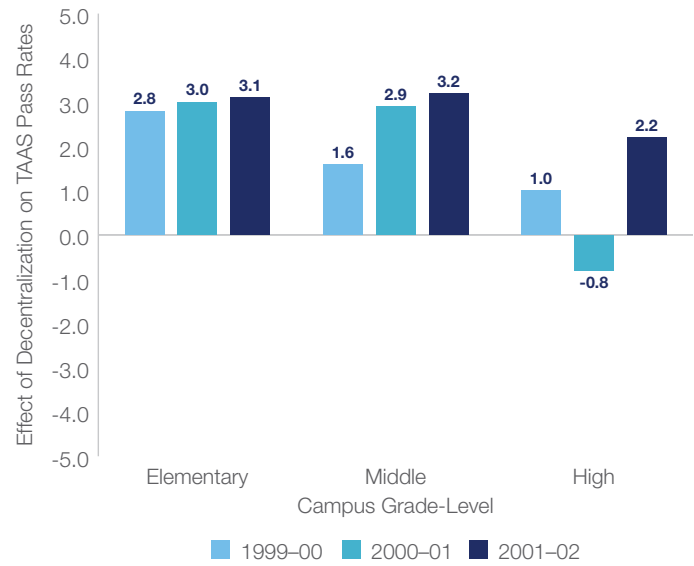
	Black			Hispanic			Economically Disadvantaged		
	Coef.	SE	Sig.	Coef.	SE	Sig.	Coef.	SE	Sig.
1999–00	–0.44	3.61	0.90	2.14	2.63	0.42	2.53	2.24	0.26
2000–01	1.04	3.61	0.77	2.50	2.63	0.34	2.63	2.24	0.24
2001–02	2.45	3.61	0.50	2.92	2.63	0.27	3.01	2.24	0.18
# of schools	3,011			4,489			4,571		

Note. Since the analysis was limited to campuses that existed for the entire 6-year study period, the number of campuses in 1999–00, 2000–01, and 2001–02 are identical. As such, the standard errors for each year are identical. Sample sizes for analyses of black student pass rates, Hispanic student pass rates, and economically disadvantaged student pass rates differ because not all schools met Texas Education Agency (TEA) reporting standards in terms of minimum number of students of a particular subgroup present in a school for an estimate to be calculated.

Key Finding #3: Decentralization was not associated with increases in achievement for elementary schools, middle schools, or high schools.

Figure 3 provides estimates of the impact of decentralization in HISD for elementary schools, middle schools, and high schools. Consistent with other findings in this report, when HISD schools are compared to similar schools of the same level, there is no significant effect of decentralization on achievement. Although Figure 3 shows that, in some cases, schools in HISD had slightly higher or lower pass rates than similar schools across the state, the differences were never statistically significant (see Table 3).

Figure 3. Effect of Decentralization on TAAS Pass Rates in HISD by Campus Level, 1999–2000 through 2001–02.



Note. The bars represent the difference in the change in TAAS pass rates in HISD and matched non-HISD campuses in 1999–2000, 2000–01, and 2001–02 for elementary, middle, and high schools. For example, one year after decentralization was fully implemented (1999–2000), the TAAS pass rates of elementary schools in HISD were 2.8 percentage points higher than the TAAS pass rates of elementary schools in the matched sample of non-HISD campuses. None of these differences are statistically significant (see Table 3), meaning there is no evidence that decentralization is responsible for the pass rate difference between HISD and non-HISD campuses.

Table 3. Effects of Decentralization on Campus TAAS Pass Rates in HISD by Campus Grade-Level

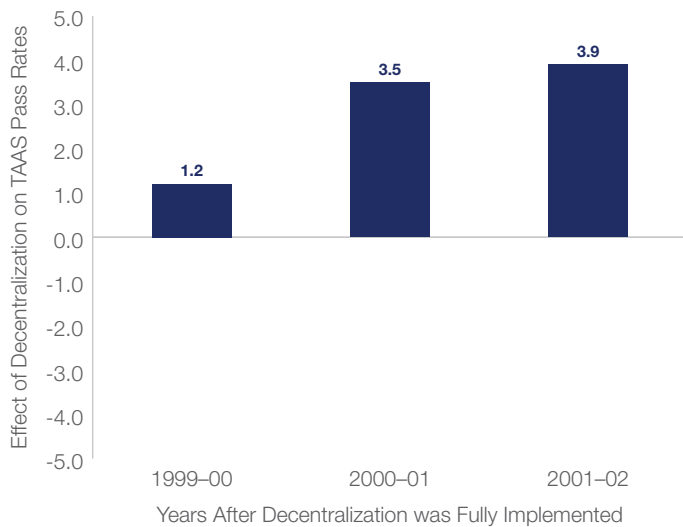
	Elementary			Middle			High		
	Coef.	SE	Sig.	Coef.	SE	Sig.	Coef.	SE	Sig.
1999–00	2.80	3.90	0.47	1.63	4.42	0.71	1.00	4.91	0.84
2000–01	3.02	3.90	0.44	2.90	4.42	0.51	-0.84	4.91	0.87
2001–02	3.14	3.90	0.42	3.22	4.42	0.47	2.21	4.91	0.65
# of schools	2,627			1,104			925		

Note. Since the analysis was limited to campuses that existed for the entire 6-year study period, the number of campuses in 1999–00, 2000–01, and 2001–02 are identical. As such, the standard errors for each year are identical.

Key Finding #4: Decentralization was not associated with changes in achievement for small schools.

Figure 4 provides estimates of the impact of decentralization on small schools' achievement in HISD. This analysis is identical to the analysis presented in Figure 1 above, except that it was conducted on the subset of Texas schools that met HISD's current small-school criteria (see Appendix A). Table A1 of the appendix presents the number of schools that met HISD's small school criteria.

Figure 4. Effect of Decentralization on the TAAS Pass Rates of Small Schools in HISD, 1999–2000 through 2001–02.



Note. The bars represent the difference in the change in TAAS pass rates of small schools in HISD and matched non-HISD campuses in 1999–2000, 2000–01, and 2001–02. For example, one year after decentralization was fully implemented (1999–2000), the overall TAAS pass rates of small schools in HISD were 1.2 percentage points higher than the TAAS pass rates of small schools in the matched sample of non-HISD campuses. None of these differences are statistically significant (see Table 4), meaning there is no evidence that decentralization is responsible for the pass rate difference between HISD's small schools and non-HISD small schools.

Table 4. Effects of Decentralization on TAAS Pass Rates of Small Campuses in HISD

	Coef.	SE	Sig.
1999–00	1.22	4.11	0.76
2000–01	3.50	4.11	0.40
2001–02	3.92	4.11	0.34
# of schools	1,713		

Note. Since the analysis was limited to campuses that existed for the entire 6-year study period, the number of campuses in 1999–00, 2000–01, and 2001–02 are identical. As such, the standard errors for each year are identical.

Again, consistent with other findings from this study, there is no significant effect of decentralization on achievement in small schools. While small schools in HISD had slightly higher TAAS pass rates than comparison schools, these differences were not statistically significant (see Table 4). This suggests that decentralization did not have an effect on the performance of small schools in the three years after decentralization was fully implemented.

It is important to note that beginning in the 2001–02 school year, HISD provided a small school subsidy to all campuses enrolling fewer than 400 students. It is possible that this subsidy influenced the effect of decentralization on small schools in 2001–02. It is difficult to draw any conclusions regarding the effect of the small school subsidy in 2001–02, however, because only 2 middle schools and 3 high schools were identified as small schools in 2001–02.

Conclusion

Taken together, these findings suggest that decentralization did not have an impact on campus achievement, measured by TAAS pass rates, in the three years after decentralization was fully implemented. While HISD did experience moderate gains in campus achievement between 1999–2000 and 2001–02, these gains do not appear to be explained by decentralization reform. Moreover, analyses reveal that the link between decentralization and campus achievement did not vary by school level, student sub-groups, or campus size.

While the findings presented in this brief suggest that decentralization had minimal impact on student performance in the years after the reform was fully implemented in HISD, it is important to acknowledge that the analyses were limited to a single academic outcome, notably campus-level pass rates on the state accountability test. It is possible that decentralization reform had more nuanced impacts on students and schools. For instance, if decentralization had small, but significant positive effects on student test scores, particularly among lower achieving students, overall campus-level pass rates may not be sensitive to these modest academic improvements.

Moreover, because Texas switched accountability tests in 2002–03, this study was only able to track campus pass rates for three years after the PUA-based funding model was implemented in HISD. As such, if the positive effects of decentralization emerged over the longer term, this study would not be able to identify such gains.

Appendix— Data and Methodology

Data

This study uses campus-level data from Texas’ Academic Excellence Indicator System (AEIS), which served as the state’s online education data portal until 2013. Specifically, this study used campus characteristics and TAAS pass rates for the 1996–97 through 2001–02 school years, which provided three years of data prior to decentralization being fully implemented and three years of data after decentralization was fully implemented.

Sample

Prior to conducting any analyses, two filters were applied to the population of Texas public schools. First, because the analyses used in this paper rely on campuses having testing data for the entire 6-year study period, all schools that did not exist for the entire period were excluded from the analytic sample. As a result of this exclusion criteria, 1,923 of the 8,303 campuses that existed over the study period were removed from the sample. Second, because they are so few in number, multi-level campuses (e.g., K–8 and 8–12 campuses) were also excluded from the sample. As such, only elementary, middle, and high schools were retained for analysis. As a result of this exclusion criteria, 484 of the

remaining 6,380 campuses were removed from the sample. Table A1 presents the number of campuses in the sample before and after these two exclusion criteria were applied.

Key Variables

School Level: Indicator of whether a campus is an elementary, middle, or high school. A fourth category, combined schools, identifies campuses with grade-spans that encompass multiple levels (e.g., elementary-middle, or middle-high schools). Because there are relatively few combined campuses across the state, and there is significant variability in the grades these schools serve, combined campuses were removed from the analysis.

Small-School Indicator: Small schools were identified by applying HISD’s current small school definition to all schools in the analytic sample. Currently, elementary, middle, and high schools are considered small if they have fewer than 500, 750, and 1,000 students, respectively. While HISD’s definition of small schools has changed over time, for the sake of consistency this study uses the district’s current definition, as described above. Moreover, the purpose of the small-school analysis is not to evaluate any particular definition of small schools, but rather

Table A1. Number of Schools, HISD vs. Rest of State, 1996–97 through 2001–02

	All Schools		Pre-Match Sample—Full		Pre-Match Sample—Small	
	HISD	State-Wide	HISD	State-Wide	HISD	State-Wide
Elementary Schools	218	4,049	186	3,327	56	1,563
Middle Schools	62	1,681	40	1,221	11	725
High Schools	62	2,082	31	1,157	11	798
Total	342	7,812	257	5,705	78	3,086

Note. To be included in the pre-match sample, schools had to meet the following two criteria: 1) Must exist for the entire 6-year study period (1997–2002), and 2) Must be identified as elementary, middle, or high Schools (i.e., multi-level campuses were excluded from the analysis). Small Schools were identified by applying HISD’s current small school indicator to all schools in the analytic sample. Elementary, middle, and high schools are considered small if they have fewer than 500, 750, and 1,000 students, respectively.

to merely identify schools that are smaller than typical schools of a given grade level.

Percent Passing TAAS, All Tests: Overall campus-level accountability indicator identifying the proportion of all tests taken at a campus that met or exceeded the minimum accountability requirement. This measure combines test taken across the subject areas (math, reading, and writing), and grades (3–8 and 10) included in the accountability subset. In addition to pass rates for all students, pass rates for black students, Hispanic students, and economically disadvantaged students were all examined in this study.

Analytic Strategy

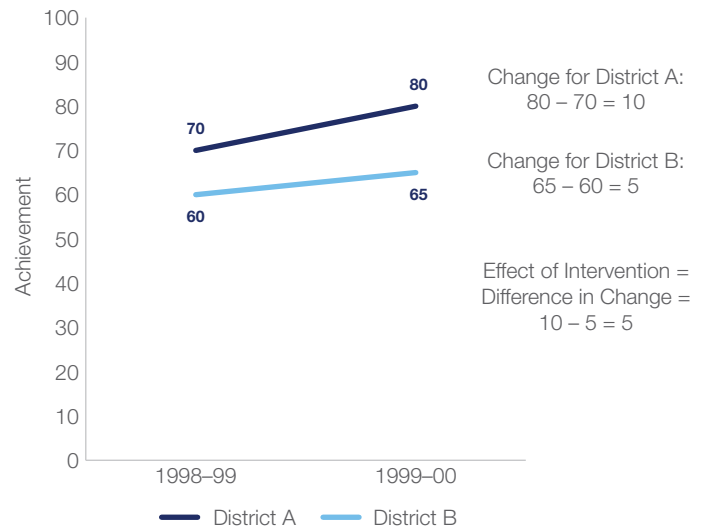
Estimating the impact of decentralization on achievement in HISD is difficult because 1) changes in achievement after 1999–2000 may be due to factors other than the full implementation of decentralization (e.g., demographic changes or other policy changes), and 2) HISD schools differ from schools in the rest of the state in important ways (e.g., high proportions of ELL, Hispanic, and economically disadvantaged students). To address these issues and provide a more accurate estimate of the impact of decentralization on student achievement, this study uses an analytic approach that incorporates the following two techniques:

Difference-in-Difference Estimation

This study employs Difference-in-Difference (DID) techniques to estimate the impact of decentralization on campus-level TAAS pass rates. To illustrate how this technique works, consider the example illustrated in Figure A1. In this example, there are two hypothetical districts, District A and District B. Suppose that District A implemented some policy change between the 1998–99 and 1999–2000 schools years, while District B did not. Of interest is the extent to which the policy change resulted in an increase in student achievement in District A. To compute the effect of the policy change on achievement in District A, the change in achievement in District A between 1998–99 and 1999–2000 is compared to the change in achievement in District B over the same period. Between 1998–99 and 1999–2000, achievement in District A increased by 10 points. At the same time, District B experienced a 5 point increase in achievement. Taking the difference in the change in achievement in District A and District B between 1998–99 and 1999–2000 reveals that the policy was associated with a 5 point increase in achievement in District A in 1999–2000. This “difference in the differences” is the primary quantity of interest in this

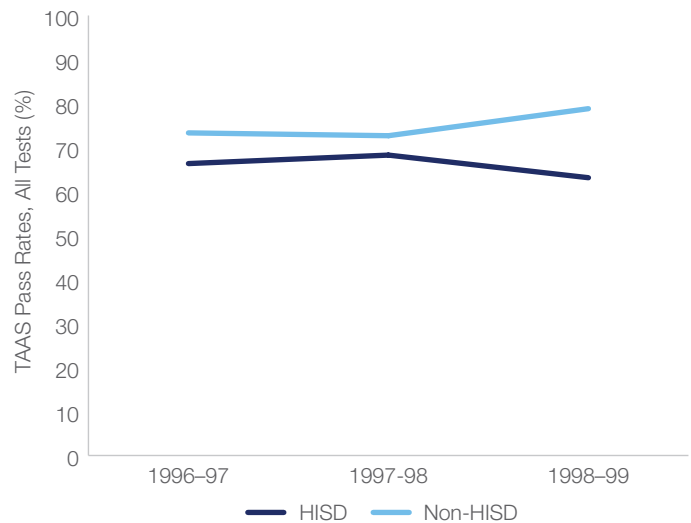
study and can be interpreted as the effect of decentralization on campus TAAS pass rates in HISD. These DID estimates are presented in Figures 1 through 4 of this brief.

Figure A1. Illustration of Difference-in-Difference Estimation.



A key assumption of the DID approach is that pre-treatment trends in the outcome for the treatment and control groups are parallel. In the context of this study, this assumption means that trends in the TAAS pass rates of schools in HISD prior to 1999–2000 must be parallel to the trends in TAAS pass rates in non-HISD schools over the same period. As Figure A2 reveals, however, this assumption is not met. Indeed, pass rates in HISD and non-HISD campuses exhibit diverging trends in the two years prior to the implementation of the PUA-based funding model in Houston.

Figure A2. TAAS Pass Rates for HISD and non-HISD Prior to Matching, 1996–97 through 1998–99.



Note. The difference in TAAS Pass rates between HISD and non-HISD campuses is statistically significant ($p < 0.05$) in 1996–97, 1997–98, and 1998–99.

Coarsened Exact Matching

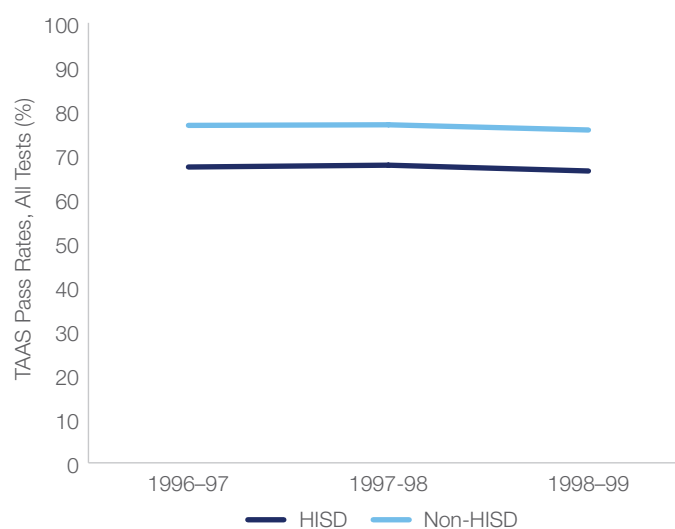
To address this violation of a key assumption of DID, rather than comparing schools in HISD to all other public schools in the state, schools in HISD were matched to public schools in Texas with similar achievement trends in the years prior to decentralization. Specifically, this study employs a technique known as coarsened exact matching (CEM) to match schools in HISD to campuses across the state of the same level (i.e., elementary, middle, or high school) with similar student achievement. Schools were matched based on the change in their annual TAAS pass rates between 1996–97 and 1997–98, and 1997–98 and 1998–99. Separate matches were conducted for each pass rate outcome examined in this study: overall TAAS pass rates, the TAAS pass rates of black students, the TAAS pass rates of Hispanic students, the TAAS pass rates of economically disadvantaged students, and the TAAS pass rates of small schools.

The CEM procedure involves two primary steps. First, the annual change in campus TAAS pass rates were coarsened into categorical variables. Each variable was split into 50 categories using Sturges’ rule for histogram bin size (Sturges, 1926). Next, each campus in HISD was matched to all non-HISD campuses whose change in pass rates between 1996–97 and 1997–98, and 1997–98 and 1998–99 fell within the exact same categories.

This matching procedure was performed five times, once for overall pass rates in all schools in Texas, once for black pass rates in all schools in Texas, once for Hispanic pass rates in all schools in Texas, once for economically

disadvantaged pass rates in all schools in Texas, and once for overall pass rates in only the subset of campuses in the state that met HISD’s small-school criteria. Table A2 presents the pre-matched and matched samples for all schools in Texas and for the small-school subset. Finally, Figure A3 presents the overall pass rate trends for the matched sample of HISD and non-HISD campuses. Compared to the unmatched pass rate trends presented in Figure A2, Figure A3 demonstrates that the matching procedure resulted in parallel pass rates for HISD and non-HISD campuses. This indicates that the “parallel paths” assumption of DID is met in the matched sample.

Figure A3. TAAS Pass Rates for HISD and non-HISD After Matching, 1996–97 through 1998–99.



Note. The change in TAAS Pass rates between HISD and non-HISD campuses is not statistically significant ($p > 0.05$) in 1996–97, 1997–98, and 1998–99. This indicates that the lines are parallel, and the parallel paths assumption of DID is met in the matched sample.

Table A2. Number of Schools in the Matched Sample after Matching on Prior Achievement, All schools and Small-School Sub-Sample

	Before Matching				After Matching			
	All Schools		Small Schools		All Schools		Small Schools	
	HISD	State-Wide	HISD	State-Wide	HISD	State-Wide	HISD	State-Wide
Elementary Schools	186	3,327	56	1,563	173	2,454	40	721
Middle Schools	40	1,221	11	725	37	1,067	8	412
High Schools	31	1,157	11	798	27	898	9	523
Total	257	5,705	78	3,086	237	4,419	57	1,656

Regression Models

As mentioned above, the effects of decentralization on TAAS pass rates in HISD are estimated within a DID framework. The DID models are estimated as follows:

$$Y_{it} = \alpha + \beta(\text{HISD}_i) + \gamma_t + \gamma_i + \delta(\text{HISD}_i * \gamma_t) + \varepsilon_{it}$$

where, α is the mean TAAS pass rates of non-HISD campuses in 1998–99, β is the difference in the mean TAAS pass rates in HISD and non-HISD campuses in 1998–99, HISD_i is an indicator equal to 1 if a campus is in HISD, and 0 if a campus is not in HISD, γ_t is a set of school year fixed effects (1998–99 is the reference category), γ_i is a set of campus fixed effects, δ is the effects of interest, representing the effect of decentralization on campuses in HISD in each of the 6 years included in this analysis, and ε_{it} is a campus by school year error term.

Mission

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