Feast and Famine: Inequity in the Texas School Finance System

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ABSTRACT

School funding formulas built upon historically inequitable foundations, such as the property-tax-based system in Texas, warrant continuous monitoring to understand the degree to which they contribute to inequity. Following a review of the political and legal history of the state's school funding formulas and the most recent school finance changes enacted by the legislature, this study employs horizontal and vertical equity analyses to demonstrate the ways in which property wealth continues to overpower equity mechanisms built into the school funding system, leading to the persistence of financial inequity among school districts.

INTRODUCTION

Research has consistently confirmed the importance of school funding and continues to explore the ways in which resource allocation influences performance in the dynamic landscape of public education (Handel and Hanushek 2023). Three resources consistently found to improve educational outcomes are teacher quality, including teacher training, verbal ability, and years of experience; administrative policies establishing adequate levels of collaborative management, low student-to-teacher ratios, and small class sizes; and fiscal and physical capacity to provide adequate levels of expenditures per student, high teacher salaries, and contemporary buildings and facilities (Verstegen and King 1998; King and MacPhail-Wilcox 1994; Rolle 2004; Goldhaber and Hansen 2013; Chetty et al. 2014). The indisputable importance of funding in the performance of schools, combined with the egalitarian aspiration of fair access to quality education, provides the impetus for the exploration of financial equity within school systems.

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Funding for school systems built upon historically inequitable foundations, such as the property-tax-based system in Texas, warrant continuous monitoring to understand the degree to which they contribute to inequity. In Texas, the school finance system is referred to as the Foundation School Program, a set of formulas that determine both the minimum amount of funding each school district receives for the students served (entitlements) and the proportion of state and local property tax revenue that should be used to fund the system. The entitlement formulas include both student- and district-level characteristics to account for the vast differences in student population served and property wealth across the state. In theory, the system's design is an ideal combination of a student-attendance-driven formula equalized for regional differences in cost (Knight and Mendoza 2019).

Historically, however, the equity mechanisms built into the Foundation School Program were overwhelmed by the heavy influence of property wealth throughout the system. Mechanisms within the formulas that were intended to provide additional funding to small schools, account for regional cost-of-education variation, and provide for students with particular educational needs were largely ineffectual as the fundamental considerations of property wealth within the funding mechanisms overpowered the equity provisions and created enormous gaps in per-pupil funding among the more than 1,000 school districts (Verstegen 1987; Reschovsky and Imazeki 2001; Hoxby and Kuziemko 2004; Imazeki and Reschovsky 2004, 2006; Rolle and Wood 2012; Rolle and Jimenez-Castellanos 2014). Stated differently, the floor for minimum levels of funding guaranteed by the system was far below funding levels allowed at the ceiling. Despite a series of small changes implemented as a result of litigation rulings, the underlying structure of the Texas school finance system that produced such substantial inequity operated relatively unchanged from 2006 to 2018.

In 2017, the Texas Legislature authorized a commission to develop recommendations for improvements to the Foundation School Program that specifically addressed the relationship between state and local funding in the system, tax effort, and policy changes for demographic and geographic diversity.[1] After receiving recommendations from the commission, the 86th Texas Legislature in 2019 passed House Bill (HB) 3, which updated school funding formulas by restructuring recapture to ensure more dollars remained locally; compressing tax rates to reduce the tax burden amid property value increases; and adjusting formulas to redirect funding to key programs and support students in need.

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1. See "Funding for Impact: Equitable Funding for Students Who Need It the Most: Final Report." Texas Commission on Public School Finance (2018). https://tea.texas.gov/sites/default/files/Texas%20Commission%20on%20Public%20School%20Finance%20Final%20Report.pdf

This study aims to analyze the outcomes of the public school finance formulas altered by HB 3 to determine how and to what degree equity in the state was affected. Following Berne and Stiefel's (1984) conceptualization of equity in school finance and guided by more contemporary research (Rolle and Liu 2007; Toutkoushian and Michael 2007), this study examines both horizontal and vertical equity within the Texas school finance system before and after the implementation of HB 3. Horizontal equity, or equal treatment of equals, examines the extent to which districts with similar costs for basic education determined by aspects such as wealth and size are funded similarly. Vertical equity, or unequal treatment of unequals, examines the extent to which similar levels of additional dollars flow to student populations that are more costly to educate, such as special education, low-income, or English language learners.

There are many rationales for this study's focus on inequity. Over the past several decades, various school finance lawsuits have challenged the state on the basis of equity by demonstrating how the Texas school finance system has allowed for vast differences in per-pupil funding to exist, even within similarly situated school districts and among similarly situated students (Verstegen 1987; Reschovsky and Imazeki 2001; Hoxby and Kuziemko 2004; Imazeki and Reschovsky 2004, 2006; Rolle and Wood 2012; Rolle and Jimenez-Castellanos 2014). Despite demonstrations in the courts describing a per-pupil difference of upward of $10,000, the courts have not required the legislature to remedy the property wealth-dependent system that is perpetuating gaps in funding (Husted and Kenny 2014). As the concept of equity in school finance is defined in terms of fairness such that provisions are made to equalize opportunity among different students (Berne and Stiefel 1999), it is important to investigate how and to what degree school district funding varies for students across the state. This study begins with a review of the political history of the school funding formulas and provides a description of the changes included in HB 3. After providing context through a summary of the school finance litigation against the state and previous equity analyses conducted on Texas's school finance system, this paper demonstrates the trends in horizontal and vertical equity before and after HB 3.

HISTORICAL POLICY CONTEXT OF TEXAS SCHOOL FINANCE INEQUITY

The long history of Texas's school finance system originates in 1854 when Texas received $2 million in U.S. bonds from the New Mexico boundary settlement and awarded flat grants to districts providing education (Watts and Rockwell 1989). Half a century later, in 1909, the legislature established a public education system of districts with taxing authority, and in 1931, the courts ruled that additional funding provided to rural and property-poor school districts was a suitable

provision under the Texas constitution (Hobby and Walker 1991). By 1947, the state's explosive enrollment growth following World War II and vast disparities in funding created by the existing school finance system provided pressure to revamp the funding formulas. Following recommendations of the Gilmer-Aikin Committee formed by the legislature, the state adopted the Foundation School Program, a school finance system with equalization mechanisms for property wealth and tax effort that provided a minimum level of funding and allowed districts to enrich that minimum level through taxation without limit (Hobby and Walker 1991; Cardenas 1997).

Perhaps the most significant early Texas school finance litigation ruling occurred at the U.S. Supreme Court in *San Antonio Independent School District v. Rodriguez* (1973),[2] where it was established that education was not a fundamental right recognized by the U.S. Constitution and was not protected under the 14th Amendment (Walsh 2011). This case laid the foundation for all future school finance cases across the nation to be argued at the state level and not at the federal level (Imazeki and Reschovsky 2004). Without direction from the Supreme Court to address the racial and socioeconomic disparities created by property wealth differences, the Texas Legislature largely maintained the status quo of the school finance system for the next several years, with the exception of adopting a small guaranteed tax yield and occasionally increasing the basic allotment (Imazeki and Reschovsky 2004; Flippin and Shanahan 2004). The minute advances in equity created by these small changes were documented in literature, though researchers cautioned that the system's dependency on property wealth, decreasing oil prices, and rapid increases in school enrollment could all quickly create large disparities in the system (Verstegen 1987).

It was not until 16 years after the *Rodriguez*[3] ruling, when the legislature was again pressured via litigation, that the state adopted major changes in the Foundation School Program. As the result of *Edgewood Independent School District. v. Kirby* (1989),[4] the legislature adopted a weighted student system to provide additional funding for students in poverty, special education students, bilingual education students, and vocational students (Walker 1985; Picus and Hertert 1993; Clark 2001; Flippin and Shanahan 2004). Though the weighted student system was a step in the direction for equity, the property wealth differences at the heart of the disparity problem were not addressed in the adopted changes.

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2. San Antonio Independent School District v. Rodriguez (1973) 337 F. Supp. 280 (W.D. Tex 1971), rev'd 411 U.S. 1.

3. San Antonio Independent School District v. Rodriguez (1973) 337 F. Supp. 280 (W.D. Tex 1971), rev'd 411 U.S. 1.

4. Edgewood Independent School District v. Kirby (1989). 777 S.W.2d 391 (Tex.).

This pattern of litigation documenting major disparities in school funding followed by legislation making small changes to the school finance mechanism has dominated the history of Texas school finance (Husted and Kenny 2014). Between 1989 and 2005, seven different challenges to the weighted student funding system were litigated. While none of the challenges to the system resulted in substantial changes to the underlying reliance on property tax wealth, several important definitions and standards of performance for Texas's school finance system were developed:

1. Adequate facilities were established as part of an efficient system of public schools in *Edgewood Independent School District. v. Kirby* (1989).

2. The efficiency standard was defined as substantially equal access to similar revenues per pupil at similar levels of tax effort in *Edgewood Independent School District. v. Kirby* (1989).[5]

3. The suitability standard was defined as a system that could accomplish its purpose, providing a general diffusion of knowledge to all children, in *Edgewood Independent School District. v. Meno* (1995).[6]

4. Three measures of system equity were specified in *Edgewood Independent School District. v. Meno* (1995)[7] : at least 98% of school revenues should be within the equalized system; at least 85% of students should attend those schools; and the revenue per weighted student in the wealthiest of districts should not exceed $600 more than the average of poor districts.

Despite the minimal wealth equalization mechanisms, incremental adjustments to basic allotments, and tax rate compression and penny swaps adopted over the years, the underlying inequity of the system continues to be ubiquitous in the school finance mechanism output (Dyson 2004). The most recent Supreme Court decision iterates Texas's nearly 50-year struggle to find balance among educational opportunity, fiscal efficiency, and local control. Though the Texas Supreme Court ruled the system constitutional in 2016, it cautioned that the system warranted redesign.[8]

Recent Overhaul of the Texas Foundation School Program
In 2019, the 86th Texas Legislature passed HB 3, which was perhaps the most substantial alteration of the school finance mechanism since adoption of the first weighted student system in 1989. As summarized by the Texas Education

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5. Ibid.
6. Edgewood Independent School District v. Meno. (1995). 893 S.W.2d 450 (Tex.).
7. Ibid.
8. Morath et al. v. The Texas Taxpayer and Student Fairness Coalition et al. (2016). 142 S.W.3d 310 (Tex.).

Agency,[9]   the bill's effects can be broken down into four areas: funding and equality; reduction and reform of property taxes and recapture; student outcomes; and teacher compensation and training.

Funding and Equality
HB 3 made several key changes to the funding for school districts. The basic allotment was increased from $4,765 to $6,160, and the district-specific adjustments to the basic allotment (cost of education and small- and mid-sized adjustments) were removed. The cost of education adjustment was removed completely, and the small- and mid-sized adjustment was made into a line-item funding amount per student in average daily attendance. The guaranteed yields in enrichment funding, or Tier II, were increased from $59.97 to $98.56 and from $31.95 to $49.28 for Level I and Level II, respectively.

In recognition of the community components of poverty, funding provided for low-income students was changed from a flat-rate allotment for students in average daily attendance to a scale of funding provided for students in attendance based upon the level of poverty for the students' residence. Varying levels of funding were also introduced for bilingual and English as a second language programming, as well as new provisions made for dropout recovery programs and students with dyslexia.

Reduction and Reform of Property Taxes and Recapture
HB 3 made several significant changes to local property taxation in order to lessen property taxes for residents, rebalance the state and local contributions to funding, and adjust the tax rate collections subject to recapture. Tax rates for maintenance and operations were compressed, future tax rate compression was formally linked to changes in property value, and tax effort not subject to recapture was increased. The bill also introduced new procedural requirements for voter approval of tax increases or bonds for new facilities.

Student Outcomes
HB 3 required full-day prekindergarten for 4-year-olds (though only half-day attendance is allowed in the funding mechanism) and established an early education allotment for students in kindergarten through third grades who are educationally disadvantaged or demonstrate limited English proficiency. The bill rewarded college, career, and military readiness outcomes with bonuses for success and reimbursed school districts for the cost of college preparatory exams for eligible students. Notably, the per-pupil allotment for high school students

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9. For a summarization of HB3 see "House Bill 3- 86th Texas Legislature." Texas Education Agency, 2019. https://tea.texas.gov/sites/default/files/HB3_2-Pager.pdf

was removed.

Teacher Compensation and Training

HB 3 established a teacher incentive allotment, which provides significant bonuses for "master," "exemplary," or "recognized" teachers under locally established performance criteria; a mentor program allotment that provides funding for teacher mentoring in their first two years; and school district reimbursements for certification exam fees. Additionally, the bill required districts to allocate 30% of annual Foundation School Program increases to improving compensation for teachers, nurses, and librarians.

Details of the current and former Foundation School Program formula components are provided in Appendix A.[10]

EQUITY IN TEXAS SCHOOL FINANCE

The Foundation School Program formulas include mechanisms to provide both horizontal and vertical equity. Horizontal equity mechanisms include statutorily established district-based allotments adjusted for size and location; minimum and maximum tax rates; and guaranteed yields on taxing efforts for both operations and facilities funding. The student-based program funds for special education, low-income, bilingual education, grade level, career and technology education, and gifted and talented education programs provide opportunity for vertical equity. Though these components have existed for more than two decades in the funding mechanism, equity analyses of statewide funding have shown little evidence of lasting improvement to equity since their inception.

Over the years, several studies have examined the effects of legislative finance reform. During the *Edgewood I*[11] litigation, Verstegen (1987) empirically examined the effects of HB 72, one of the first attempts of school finance reform that created the weighted pupil Foundation School Program. Verstegen (1987) found that since 1976, improvements to the system had increased overall equity in the state but the system was vulnerable to rapid declines in equity if the state experienced change in property value, oil prices, or enrollment. The school finance system ultimately resulting from the *Edgewood* rulings was empirically examined by Imazeki and Reschovsky (2001, 2004, 2006). These studies examined the equity standards set as a result of the *Edgewood II* (1995)[12] decision using three different methods: equality in revenue per pupil, average tax price, and wealth neutrality. Using all three methods, Imazeki and Reschovsky (2006)

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10. Appendix A can be accessed here: https://www.uh.edu/education/research/institutes-centers/erc/reports-publications/feast-and-famine-for-jef-appendix-a-oct_2023.pdf
11. Edgewood Independent School District v. Kirby, 777 S.W.2d 391 (Tex. 1989)
12. Edgewood Independent School District v. Meno. (1995). 893 S.W.2d 450 (Tex.).

found that equity within the school finance system had improved over time but the system's inability to adapt to changes in the economy resulted in a system that was marginally more equitable than before and failed to meet its own standards after only a few years. Hoxby and Kuziemko (2004) pointed out the demise of Texas's main method of equalization: recapture, or Robin Hood. They illustrated how local control of tax rates and spending and differences in property wealth prevent the system from operating as planned and leave the state with a large debt. The system did not work to recapture revenue or distribute equalization aid as planned (Hoxby and Kuziemko 2004).

Following the research from the early 2000s, publications examining equity in the Texas school finance system were scarce. Rolle and Wood (2012) presented horizontal equity statistics for all Texas school districts that highlighted trends in decreasing equity. They found that between 2005 and 2009, both the standard deviation (15% increase) and the coefficient of variation (9% increase) of per-weighted-student school district revenues signaled decreasing equity. While analyzing the efficacy of the Texas school funding formulas and the funding of English language learners, Rolle and Jimenez-Castellanos (2014) presented horizontal equity statistics demonstrating that from 2007 through 2012, districts serving the largest percentages of English language learners received, on average, $1,300 less per pupil than those serving the smallest percentages. These findings aligned with the numerous analyses performed on Texas school districts over the years that consistently confirmed the large inequity within the system (Verstegen 1987; Reschovsky and Imazeki 2001; Hoxby and Kuziemko 2004; Imazeki and Reschovsky 2004, 2006; Rolle and Wood 2012).

The most recent examinations of financial equity within the Texas public school system find the same results. In Weiss's research (2020), schools serving higher proportions of low-income students, English language learners, and students of color received less funding than other districts. Moreover, districts are hobbled within the system such that even with increased tax effort, poorer school districts cannot raise ample dollars to maintain or repair facilities much less keep up with student growth (Rivera and Lopez 2019). The ways in which inequities such as these have persisted after the passage and implementation of HB 3 are the focus of this study.

DATA

The panel data set for this exploration was constructed from publicly available data from the Texas Education Agency. The Summary of Finances reports [13]provided individual district-level detail for the Foundation School Program

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13. See Foundation School Program Summary of Finances Reports, Texas Education Agency https://tealprod.tea.state.tx.us/fsp/Reports/ReportSelection.aspx

calculation, and Texas Academic Performance Reports[14] provided information regarding student enrollment and program participation. Data for this study span from 2016 (the 2015–16 school year) through 2022 (the 2021–22 school year). This period was selected so the data set would contain three years of data prior to the passage of HB 3 in 2019 and continue through the most recent data available. The school districts included in this study are the districts that collect property taxes, thus charter schools and special school districts like those housed on military bases were excluded. The data set represents roughly 83% of the total districts and charter schools in operation in the state each year.

The Texas public school system is composed of more than 1,000 independent school districts that range in size from less than 50 students to more than 200,000. More than half of all Texas school districts enroll less than 1,000 students each year. In 2022, the state student population was an increasing Hispanic majority (53%) and increasing Asian population (5%), with decreasing proportions of White students (26%) and a stable population of Black students (13%). Most Texas students were economically disadvantaged (61%), and the state's student population was increasingly participating in English language learner (22%), career and technology education (26%), gifted and talented (8%), and special education (12%) programming.

Table 1 shows the total average daily attendance (ADA) and the total funding of Texas districts included in this analysis over the past seven years. In 2016, the districts in this analysis had a total ADA of 4,692,144 students and a total Foundation School Program funding of $51.8 billion. Despite annual fluctuations in ADA, funding increased to reach a high of $56.4 billion in 2020. From 2016 to 2018, the school districts in this analysis increased ADA marginally each year but decreased in 2019 and again in 2020 as the pandemic shut down schools. Since then, the school districts in this analysis have not recovered to pre-pandemic ADA totals, and the total funding has decreased in parallel to reach a seven-year low of $50.5 billion in 2022. Adjusting for inflation by displaying constant 2021 dollars, Table 1 demonstrates how the Foundation School Program has effectively reduced the total funding to parallel the reduction in ADA.

Table 1 also breaks down the total funding amount by state and local funding in constant 2021 dollars.[15] State funding refers to funds provided to school districts through the Foundation School Program formulas, and local funding refers to

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14. See Texas Academic Performance Reports, Texas Education Agency https://tea.texas.gov/texas-schools/accountability/academic-accountability/performance-reporting/texas-academic-performance-reports

15. Note that federal funds, including those provided by the American Rescue Plan, are not included in this analysis. However, in 2021–22, $77 million was included in the state funding component for the maintenance of American Rescue Plan funds related to COVID-19 (TEC 48.281).

Table 1: Total School District* Student Average Daily Attendance and Funding by Source, 2016–2022

	2016	2017	2018	2019	2020	2021	2022
Districts	1,021	1,019	1,019	1,018	1,015	1,010	1,016
ADA	4,692,144	4,714,924	4,726,941	4,724,123	4,603,950	4,649,858	4,610,616
Total Funding	$51.8B	$51.7B	$52.0B	$52.9B	$56.4B	$54.4B	$50.5B
State Funding	$22.0B (43%)	$20.8B (40%)	$20.0B (38%)	$19.4B (37%)	$21.5B (38%)	$20.3B (37%)	$18.1B (36%)
Local Funding	$29.7B (57%)	$30.8B (60%)	$32.0B (62%)	$33.5B (63%)	$34.9B (62%)	$34.1B (63%)	$32.3B (64%)
Source: Summary of Finances Reports, Texas Education Agency.							
Notes: * Districts refer to independent school districts with taxing authority. All funding is displayed in billions of dollars and constant 2021 dollars, and local funding has been adjusted for recapture. ADA stands for average daily attendance. State and local funding may not add up to total funding due to rounding.							

property tax collections in the school districts after accounting for recapture. From 2016 to 2019, the state component decreased from 43% to 37%, and after the passage of HB 3, the state component decreased from 38% in 2020 to 36% in 2022. The local funding component had an opposite response between 2016 and 2019, increasing from $29.7 billion in 2016 to $33.5 billion in 2019. However, after the passage of HB 3, the local funding component decreased from $34.9 billion in 2020 to $34.1 billion in 2021 and $32.3 billion in 2022. Across the past seven years, including those years impacted by HB 3, the local component has comprised more than half of the total public school funding.

METHODS

To understand the changes to the funding mechanism and distribution of funds across the more than 1,000 school districts in the state over time, this study incorporates two methods of equity analysis: traditional horizontal and vertical equity analyses and a contemporary application of regression, each discussed in turn. First, standard descriptive statistics and common horizontal equity statistics are analyzed over time (Berne and Stiefel 1984). Common equity statistics included in this paper are:

- **Range**: the difference between the highest and lowest per-pupil funding,
- **Percentile ratio**: the ratio of per-pupil funding at each percentile,
- **Coefficient of variation**: the per-pupil funding standard deviation divided by the mean,
- **McLoone Index**: the sum of funding for districts below the per-pupil funding median divided by the sum of funding if all districts were at the

per-pupil funding median, and
- **Gini coefficient**: the value indicating the inequality in per-pupil distribution, with 0 indicating perfectly equal distribution, and 1 indicating the most unequal distribution.

Vertical equity is evaluated with ratio analyses, which compare the mean per-pupil funding of districts serving the highest proportions of students in a classification to that of districts serving the lowest (Berne and Stiefel 1984). Values of 1 indicate equal distribution of funds among the full range of characteristics, while 0 indicates unequal distribution.

Second, following the lead of Toutkoushian and Michael (2007), vertical and horizontal equity is further examined by estimating an equation that regresses revenue per pupil on vertical equity factors and district characteristics related to the cost of providing education. The equation takes the form:

$$Y_j = \alpha_0 + \beta_V V_j + \beta_Z Z_j + e_j$$

where Y represents total revenue per pupil for district j, α_0 is the intercept, and e represents random error. β_V represents the coefficients estimated for the vertical equity factors (V), including career and technology education (CTE) students, special education (SpEd) students, economically disadvantaged students (EcoDis), bilingual/English as a second language (ESL) students, and gifted and talented (Gifted) students. β_Z represents the coefficients estimated for the district characteristics (Z) that influence the cost of providing education, including property value per pupil (Wealth) and refined average daily attendance (Size). Vertical equity is assessed by comparing the regression coefficients to the weights established in the Foundation School Program funding formulas. Horizontal equity is assessed by comparing the residuals resulting from the equation across school districts.

RESULTS

With the passage of HB 3 in 2019, the Texas Legislature overhauled the Foundation School Program to balance state and local contributions, reduce recapture, and restructure program funds for school districts. The purpose of this research is to reassess horizontal and vertical equity under these latest changes to Texas's public school finance formulas. While many of the new funding mechanisms went directly into effect, per the governor's directive, during 2020 and 2021, some components of the new legislation, such as the teacher incentive allotment and reimbursement funds, were rolled out and districts were permitted to voluntarily participate. These programmatic choices, as well as COVID student attendance

protocols and funding rules, did and will continue to influence funding levels as they are implemented by more districts in the state. The following paragraphs provide analyses of equity using traditional horizontal equity statistics, ratio analyses of total revenue per pupil among programmatic and demographic characteristics, and a regression-based equity analysis. A synthesis of these findings in relation to the ways in which Texas school finance has changed over time is presented in the Discussion section.

Traditional Horizontal Equity Statistics

Table 2 demonstrates the change in per-pupil funding levels from 2016 through the implementation of HB 3 in 2019 and further through 2022. The table shows total per-pupil funding, including both state and local components, minus recapture paid to the state. In 2016, the mean funding per pupil for the 1,021 school districts included in this analysis was $12,862. After declining to a low of $12,669 per pupil in 2017 and increasing to $12,725 per pupil in 2018, the mean total funding per pupil increased to $13,309 in 2019 and $15,081 in 2020 and fell to $14,189 in 2021 and $13,381 in 2022. Across the seven years included in this analysis, 2020 proved to be the school year in which the Texas school finance system provided the most dollars per pupil to districts.

The range of funding per pupil increased substantially after 2019, and as signaled by the increase in the 95th percentile level funding per pupil, the largest increases were experienced in the wealthiest school districts. By 2022, the poorest school districts, those in the bottom 5th and 10th percentiles, returned to funding levels of 2016 while per-pupil funding for wealthier school districts generally increased. The imbalanced increase of resources to the lower half of the district distribution is evidenced by the declining McLoone Index. The generally increasing Gini coefficient also demonstrates a trend away from equity, as values closer to 0 indicate equal distribution and values closer to 1 indicate unequal distribution.

Local Funding

Table 3 displays the descriptive and horizontal equity statistics for the local funding of districts included in the analysis. The local revenue amount has been adjusted for recapture paid to the state so that the numbers reflect local dollars per pupil that remained in the district. In 2016, the mean local funding per pupil for the 1,021 districts in the analysis was $6,939, and the mean local funding for the 1,016 districts in the analysis for 2022 increased to $7,859 per pupil. Across the past seven years, the range of the per-pupil local funding across the state has changed drastically. Prior to HB 3, however, the range was generally less than the range after implementation of HB 3 in 2019. After HB 3's tax-rate compression

Table 2: Descriptive and Horizontal Equity Statistics for Combined Local (Minus Recapture) and State Funding per Pupil in Texas, 2016–2022

Year	2016	2017	2018	2019	2020	2021	2022
Districts	1,021	1,019	1,019	1,018	1,015	1,010	1,016
Basic Allotment	$5,140	$5,140	$5,140	$6,160	$6,160	$6,160	$6,160
Mean	$12,862	$12,669	$12,725	$13,309	$15,081	$14,189	$13,381
Median	$11,721	$11,689	$11,742	$12,097	$13,688	$12,990	$12,258
Standard Deviation	$4,395	$4,473	$4,194	$5,530	$7,865	$7,354	$6,288
Range	$58,623	$76,402	$57,853	$86,043	$134,023	$137,659	$127,376
Percentiles							
5th	$9,725	$9,529	$9,711	$9,835	$10,945	$10,427	$9,725
10th	$10,112	$9,984	$10,117	$10,280	$11,375	$10,805	$10,092
25th	$10,732	$10,733	$10,825	$10,992	$12,256	$11,702	$10,944
75th	$13,172	$12,914	$13,084	$13,511	$15,418	$14,580	$13,892
90th	$15,990	$15,709	$15,708	$16,376	$18,197	$17,202	$16,567
95th	$20,521	$19,885	$18,946	$20,811	$23,104	$20,469	$19,951
Percentile Ratios							
95/5	2.11	2.09	1.95	2.12	2.11	1.96	2.05
90/10	1.58	1.57	1.55	1.59	1.60	1.59	1.64
75/25	1.23	1.20	1.21	1.23	1.26	1.25	1.27
Coefficient of Variation	34.18	35.31	32.96	41.55	52.15	51.83	46.99
McLoone Index	0.865	0.872	0.876	0.861	0.850	0.858	0.858
Gini Coefficient	0.133	0.13	0.124	0.143	0.153	0.143	0.146
Notes: Per-pupil funding amounts are calculated at the district level by dividing the district revenue by the district average daily attendance. Dollar amounts are presented in constant 2021 dollars, with the exception of the statutorily authorized basic allotment							

and adjustment to the tax revenue subject to recapture took effect in 2019, the range of per-pupil local funding across the state increased from $93,006 in 2019 to $134,291 in 2020 before decreasing to $95,620 in 2021 and $85,123 in 2022. The increased range of per-pupil local funding amounts after HB 3 combined with the upward shift in per-pupil local funding in the 75th, 90th, and 95th percentiles signal the trend of increased local revenue for the wealthiest of school districts. The Gini coefficient and the McLoone Index remained relatively stable, indicating little change in the distribution of dollars across the entire range of the system.

Change is demonstrated in the range and percentile funding levels. The increased range signals the wealthiest of districts relief from recapture; an upward shift in the percentile funding levels corroborate the increase in wealthy school district local funding; and a large and increasing coefficient of variation indicates wide dispersion across the spectrum of local funding. The drastic decrease in the

Table 3: Descriptive and Horizontal Equity Statistics for Local Funding (Minus Recapture) per Pupil in Texas Districts, 2016–2022

Year	2016	2017	2018	2019	2020	2021	2022
Districts	1,021	1,019	1,019	1,018	1,017	1,010	1,016
Basic Allotment	$5,140	$5,140	$5,140	$6,160	$6,160	$6,160	$6,160
Mean	$6,939	$6,603	$7,032	$7,536	$8,112	$7,684	$7,859
Median	$5,594	$5,560	$5,784	$6,204	$6,436	$6,191	$6,451
Standard Deviation	$4,921	$4,653	$4,957	$6,054	$8,158	$7,002	$6,081
Range	$44,712	$76,050	$49,307	$93,006	$134,291	$95,620	$85,123
Percentiles							
5th	$2,013	$2,025	$2,065	$2,258	$2,372	$2,299	$2,401
10th	$2,571	$2,598	$2,624	$2,810	$2,870	$2,805	$2,977
25th	$3,885	$3,840	$3,951	$4,260	$4,493	$4,269	$4,528
75th	$9,102	$8,360	$8,802	$9,409	$9,978	$9,350	$9,582
90th	$11,936	$11,385	$12,350	$12,531	$13,316	$12,809	$13,404
95th	$15,146	$13,540	$15,875	$16,669	$17,946	$16,506	$18,133
Percentile Ratios							
95/5	7.52	6.69	7.69	7.38	7.56	7.18	7.55
90/10	4.64	4.38	4.71	4.46	4.69	4.57	4.50
75/25	2.34	2.18	2.23	2.21	2.20	2.19	2.12
Coefficient of Variation	70.92	70.47	70.50	80.33	100.39	91.13	77.38
McLoone Index	0.61	0.62	0.62	0.62	0.61	0.62	0.63
Gini Coefficient	0.34	0.32	0.34	0.34	0.36	0.35	0.33

Notes: Per-pupil funding amounts are calculated at the district level by dividing the district revenue by the district average daily attendance. Dollar amounts are presented in constant 2021 dollars, with the exception of the statutorily authorized basic allotment.

coefficient of variation between 2021 and 2022 reflects the large decrease in local revenue standard deviation demonstrated between 2021 and 2022.

State Funding

Table 4 details the descriptive and horizontal equity statistics for state funding in the Foundation School Program for the districts included in this analysis. The mean state funding for districts in this analysis in 2016 was $5,924 and that increased to $6,628 in 2022. Across the percentile analysis, larger increases are seen in the higher percentiles. In this distribution, the McLoone Index must be carefully interpreted; the Foundation School Program mechanism funds entitlements with local funds first and then fills in with state funds where necessary. Because the bottom half of the distribution here is represented by the districts that receive the least state aid, interpretation of resources is limited because those could be schools with high local tax yields or student populations

that do not generate high entitlements. Generally, the McLoone Index has remained relatively stable, thus indicating no change in a more equitable distribution. The Gini coefficient demonstrates departure from equitable distribution; thus the relative stability indicates that equity within the system has not radically changed. The coefficient of variation increased starkly in 2021 and 2022, reflecting the increase in standard deviation during the same time period.

Ratio Analyses

The Texas funding formulas recognize certain conditions and characteristics

Table 4: Descriptive and Horizontal Equity Statistics for State Funding per Pupil in Texas, 2016–2022

Year	2016	2017	2018	2019	2020	2021	2022
Districts	1,021	1,019	1,019	1,018	1,015	1,010	1,016
Basic Allotment	$5,140	$5,140	$5,140	$6,160	$6,160	$6,160	$6,160
Mean	$5,924	$6,066	$5,692	$5,773	$6,898	$6,505	$6,628
Median	$5,956	$6,013	$5,746	$5,683	$6,743	$6,413	$6,413
Standard Deviation	$3,124	$3,185	$3,565	$3,839	$4,103	$5,257	$5,473
Range	$25,657	$39,546	$58,330	$60,443	$68,812	$150,156	$135,620
Percentiles							
5th	$719	$932	$602	$905	$708	$702	$542
10th	$1,712	$2,042	$894	$1,112	$1,853	$1,573	$1,293
25th	$3,748	$4,040	$3,313	$3,313	$4,275	$3,992	$4,021
75th	$8,006	$8,025	$7,883	$7,964	$9,314	$8,896	$9,040
90th	$9,579	$9,565	$9,514	$9,541	$11,323	$10,692	$10,866
95th	$10,487	$10,401	$10,128	$10,551	$12,613	$11,742	$12,193
Percentile Ratios							
95/5	14.59	11.16	16.83	11.66	17.89	16.74	22.50
90/10	5.59	4.69	10.64	8.59	6.11	6.80	8.40
75/25	2.14	1.99	2.38	2.40	2.17	2.23	2.25
Coefficient of Variation	52.74	52.51	62.63	66.50	59.48	80.82	82.57
McLoone Index	0.585	0.615	0.538	0.549	0.586	0.563	0.562
Gini Coefficient	0.291	0.278	0.318	0.328	0.302	0.311	0.326
Notes: Per-pupil funding amounts are calculated at the district level by dividing the district revenue by the district average daily attendance. Dollar amounts are presented in constant 2021 dollars, with the exception of the statutorily authorized basic allotment.							

that should result in additional funding. The small- and mid-sized adjustment is intended to provide additional dollars, and formula weights are intended to provide additional dollars for economically disadvantaged students, students with limited English proficiency, and students enrolled in CTE courses. To examine the degree to which additional dollars are provided for schools serving the largest populations of students in these categories, ratio analyses of average funding for districts above and below the median for select[16] conditions and characteristics are calculated. Ratios of less than 1 indicate lower average per-pupil funding for districts serving larger proportions students in the particular condition or characteristic.

Size. The ratios of average funding for districts above and below the median in size range from a high of 0.77 in 2016, 2017, and 2018 to a low of 0.71 in 2020 and 2022. In 2019 the ratio was 0.74 and the ratio was 0.72 in 2021. The low ratio value indicates across the size analysis demonstrates that smaller schools received less per-pupil funding on average and the decreasing ratio trend indicates average per-pupil funding difference between large and small schools is increasing.

Economically Disadvantaged. The ratio of average per-pupil funding between districts that serve more economically disadvantaged students and districts that serve fewer economically disadvantaged students has ranged between 0.97 and 1.01 over the last seven years. Fluctuating very close to 1, the ratio values mean that districts that serve the most economically disadvantaged students in the state received approximately the same per-pupil funding, on average, as those that serve the fewest economically disadvantaged students.

English as a Second Language. The ratio of average per-pupil funding for districts serving the most ESL students increased from 0.91 in 2016 and 2017 to 0.92 in 2018 and 2019. In 2020, it reached a high of 0.95 and decreased to 0.91 in 2021 and 0.88 in 2022. The values less than 1 indicate a lower average per-pupil funding for schools serving the most ESL students and the decreasing trend since 2020 signals that the gap in average per-pupil funding between schools serving the most and least ESL students increased.

Career and Technology Education. The ratio analysis for students participating in CTE courses ranged from 0.76 in 2016 and 2017 to a high of 0.77 in 2018. In 2019, the ratio decreased to 0.74 and decreased to 0.72 in 2020. In 2021, the ratio

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16. Size, EcoDis, ESL, and CTE were selected because they were common across the Foundation School Program in all years of this analysis.

increased to 0.72 and increased again to 0.76 in 2022. The ratio values indicate a lower average of per-pupil funding for districts with the most CTE students, as the value remained substantially less than 1.

Race and Ethnicity. The ratios of average total funding per pupil for districts that enroll populations above and below the median of the three most predominant racial and ethnic groups in the state were also calculated. Since 2016, districts with student populations composed of larger proportions of Hispanic students than the statewide median received more funding per pupil than districts with Hispanic populations smaller than the statewide median, as ratio values have ranged from 1.00 to 1.06. Since 2016, the schools with the largest proportions of White students have received more funding per pupil than those with smaller proportions, and ratio values were never less than 1.02 and have stabilized at 1.06 since 2020. Conversely, districts with the largest proportions of Black students have consistently received less per-pupil funding, on average, than districts with smaller proportions of Black students. From 2016 to 2018, the ratio value increased from 0.86 to 0.88 and decreased to a low of 0.82 in 2020. In 2021, the ratio value was 0.84 and the ratio value was 0.83 in 2022.

Regression-Based Equity Analysis
In order to conduct regression analysis, the data set was limited to districts with total per-pupil funding within three standard deviations of the mean each year. This was to accommodate the harsh skew of the data caused by a few school districts in the state with uncommon features. Prior to HB 3, more districts received funding per pupil that was more than four standard deviations above the mean.[17] The decreasing number of districts with such extreme funding levels is a trend that indicates more equity throughout the system, as fewer districts received such comparably high rates of funding.

The results of regression analyses conducted for each year between 2016 and 2022 are displayed in Table 5. Overall, the models containing the equity factors built into the Foundation School Program account for very little of the variance between school district funding levels. Examining the vertical equity factor effects on per-pupil funding, EcoDis demonstrated a consistently positive relationship with total per-pupil revenue, and the vertical equity factors of ESL and Size demonstrated a consistently negative relationship with total funding per pupil. This means that schools with higher proportions of economically disadvantaged

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17. In 2016, 80 districts were dropped from the data set; in 2017, 66 were dropped; in 2018, 71 were dropped; in 2019, 44 were dropped; in 2020, 21 were dropped; in 2021, 12 were dropped; and in 2022, 20 were dropped.

Table 5: Coefficients from Multiple Regression Models of Vertical Equity Factors on Per-Pupil Funding, 2016–2022

	2016	2017	2018	2019	2020	2021	2022
Size	-0.02**	-0.19**	-0.19**	-0.03**	-0.05**	-0.04**	-0.04**
CTE	-19.90	-0.14**	-18.67	-37.55	-89.44*	-58.51	14.78
SpEd	79.51*	47.24	66.73*	46.82	102.93*	82.26	85.41*
ESL	-18.63*	-22.17**	-21.60**	-35.42**	-23.74	-60.81**	-51.43*
EcoDis	15.36**	14.33**	15.45**	19.38**	43.80*	28.48*	20.39*
Gifted	-3.31	22.66	-5.04	-29.84	-	-	-
Early	-	-	-	-	-64.15*	16.20	12.16
Dropout	-	-	-	-	-242.36	-82.73	-94.51
Fast	-	-	-	-	-43.42	33.23	-58.51**
Intercept	$10,661	$10,669	$10,777	$11,710	$13,137	$12,057	$10,792
Observations	941	953	948	974	994	998	996
F	13.44	10.87	15.65	14.11	14.05	14.40	27.72
R2	0.0907	0.0668	0.0963	0.0908	0.1248	0.1194	0.1607
RMSE	$1,557	$1,632	$1,510	$2,086	$2,941	$2,774	$2,450

Note: Equity factors are abbreviated as CTE for career and technology education, SpEd for special education, EcoDis for economically disadvantaged students, ESL for bilingual/English as a second language students, Gifted for gifted and talented students, Early for eligible early childhood allotment students, Dropout for dropout recovery or residential facility students, Fast for fast growth student growth, and Size for refined average daily attendance.

students received more funding than those with lower proportions, yet schools with higher proportions of bilingual/ESL students and those smaller in size received less funding.

From the results displayed in Table 5, changes in horizontal equity can also be assessed. Horizontal equity is improved when the amount of an unexplained variation decreases, which is assessed by subtracting R2 from 1 and converting it to a percentage. The unexplained variance appears to have decreased after the implementation of HB 3 in 2019, as the percentage of unexplained variance decreased from 91% in 2016 to 84% in 2022. However, the amount of unexplained variance in the models does indicate that the equity factors included have very little influence on total pupil per funding. Another means of analyzing horizontal equity is by examining the trends in standard error. The standard error of the estimate following the implementation of HB 3 increases, which indicates that variation in the per-pupil funding of similar districts has increased since the passage of HB 3.

DISCUSSION

The purpose of this study was to reassess horizontal and vertical equity under the latest changes to Texas's public school finance formulas, which resulted from the passage of HB 3 in 2019. HB 3 was novel: The rare piece of legislation

substantially modifying the Texas school finance system passed without direct legal action. Changes to the school finance system included increasing the basic allotment, removing district-specific adjustments, and reducing and reforming the property tax and recapture systems to ensure that the rapid property-value growth experienced by many areas of the state would decrease the burden to taxpayers and hold the state accountable for its share of funding for the public school system. Modest changes were made to the entitlement funding formulas, shifting weights from high school to early education and introducing variation within funding allotments for economically disadvantaged and bilingual/ESL programming. New funding was provided for voluntary teacher incentive pay, mentorship, and certification reimbursement programs, as well as bonuses for college, career, and military ready graduates.

Despite being a major focus of HB 3,[18] an increase in the state's proportion of education funding has not, as of 2022, come to fruition. The state's share of the total funding for independent school districts in the school finance system has, in fact, decreased by one percentage point each year since 2020 (see Table 1). Instead, the tax-rate compression and changes to recapture resulted in increased local funding to the wealthiest of school districts. Several findings in this study illuminate the fact that after the passage of HB 3, the largest increases in per-pupil funding were experienced by the wealthiest school districts. The range of funding per pupil increased during 2020 and 2021, as signaled by larger increases in per-pupil funding in the wealthier school districts (see Table 2). Another indication of increased wealth in the system is the high coefficient of variation of the local funding per pupil (see Table 3). This high number reflects the large variation that exists within local funding among school districts in Texas. In contrast, the poorer school districts—especially those in the bottom 5th and 10th percentiles—experienced declines in funding, returning to 2016 funding levels by 2022 (see Table 2). Clearly, wealthy school districts benefitted from HB 3 and poorer school districts did not.

As demonstrated by the regression analysis in this study, local property value continues to dominate outcomes of the Texas school finance funding formulas. Despite including metrics establishing horizontal and vertical equity within the formulas, the weight of property value alone supersedes these efforts and nullifies any intended equity. The failure of the equity efforts is also demonstrated by the ratio analysis presented in this study, where schools serving the highest proportions of economically disadvantaged students, students with limited

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18. See "Funding for Impact: Equitable Funding for Students Who Need It the Most—Final Report." Texas Commission on Public School Finance (2018). https://tea.texas.gov/sites/default/files/Texas%20Commission%20on%20Public%20School%20Finance%20Final%20Report.pdf

English proficiency, students receiving special education services, and students participating in CTE classes received, on average, no more per-pupil funding than districts serving smaller populations. Confirming findings of extant research (Hoxby 2001; Baker and Corcoran 2012; Rolle and Jimenez-Castellanos 2014; Jarmolowski et al. 2022), the weights intended to provide vertical equity in the school funding formulas are ineffectual, as their effort is not enough to overcome the influence of property wealth.

Moreover, this study confirms the persistent funding inequity for schools serving the largest populations of Black students (see Table 5). Research has identified evidence of racial discrimination in the Texas school finance system since the 1970s (Berke, et al. 1972), and contemporary research iterates the findings by illuminating the specific disadvantage of majority Mexican American school districts (Alemán 2007). The lack of advancement in equity within the Texas public school system is especially troubling considering the connection scholars have made between inequitable resources and outcomes like standardized test performance and graduation rates (Baker and Weber 2016; Kreisman and Steinberg 2019; Tajalli 2019). Without directly addressing racial inequity in property value, the lasting effect of de facto and de jure federal, state, and local segregation policies of the 20th century (Rothstein 2017) will remain omnipresent in education (Ladson-Billings and Tate 1995; Rothbart 2020).

LIMITATIONS

As HB 3 consisted of a multitude of formula changes implemented asynchronously, and many of the effects are lagged because of district implementation timelines, the full impact of HB 3 is not captured in this analysis. Furthermore, the future responses of school districts and school boards to tax-rate compression, property-value changes, and hold-harmless provision expiration are dependent on a host of unknowns not captured in the narrative of this study. This analysis is also subject to the error of state education agency data systems.

POLICY IMPLICATIONS

The restructured recapture system significantly weakened the effort of wealth redistributions in the state and will inevitably increase inequity. Outside of this equity analysis, the implications of changes made to the Texas Foundation School Program in HB 3 should be analyzed for their specific contributions to inequity in the system.

While school districts experiencing vast growth in property value benefit from a system designed to locally retain property-tax revenues, those school districts without rapid property-value growth will be ostensibly harmed by the

removal of the Cost of Education Index from the system. Though the Cost of Education Index was not regularly updated to reflect contemporary economic conditions, it was the sole mechanism within the system that adjusted for regional cost differences in the state. Without such a mechanism, the degree to which increasing costs of education such as teacher salaries, instructional materials, and technology impose undue burdens on property-poor school districts should be carefully evaluated.

In HB 3, the state implemented bonus structures in the funding system. Many of these structures, such as the teacher incentive allotment, require rigorous application processes and are designed to be phased in over several years. Other bonus structures, like those associated with college, career, and military ready graduates, also require several years to fully influence funding. Moreover, students in wealthy districts have greater access to resources and demonstrate higher performance than those with reduced educational opportunities (Villanueva 2021). Left in their current state, these structures will contribute to greater inequity across Texas.

Accomplishing equity across the property-tax-funded system of Texas's diverse landscape requires a strong mechanism for the redistribution of wealth. Without reconsiderations of support for property-poor school districts, the Texas school finance mechanism situated to favor wealthy school districts is destined to create an ever-increasingly inequitable school finance system.

CONCLUSION

Regardless of the vertical and horizontal equity structures within the school funding system, the incorporation of unbridled property wealth driving entitlement formulas perpetuates inequity within the system. The system has created an environment of feast or famine: Property-wealthy school districts generate incredible, unlimited revenue while the state provides meager provisions for property-poor school districts. This has set the state on a path of increasing inequity.

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