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When Students Leave: Predicting Public School Closures

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Persistent enrollment losses have renewed questions about district finances and school facilities. I link national enrollment, demographic, and district finance data to examine where enrollment decline is associated with elevated closure risk and how well that risk can be identified in advance. The share of school-age children in traditional public schools fell from 83.0 percent in 2019–20 to 77.8 percent in 2024–25. The share in private schools or unaccounted for in enrollment data rose from 9.4 to 13.3 percent. Most districts, including most with steep enrollment losses, maintained real spending per pupil. Nonetheless, 730 districts serving 2.3 million students combined enrollment losses of at least 10 percent with federal revenue losses of at least 2 percent of revenue. In six annual out-of-sample tests, the 10 percent of schools with the highest predicted closure risk accounted for 53–63 percent of subsequent closures. Applied to traditional public schools open in 2024–25, the one-year model predicts about 550 closures in 2025–26. The three-year model predicts about 1,700 closures by 2027–28. Risk is concentrated among small schools with declining enrollment and in districts with recent closures. These include districts that maintained spending per pupil. The findings support targeted facility planning, transition support, and monitoring.

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When Students Leave: Predicting Public School Closures

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Abstract. Persistent enrollment losses have renewed questions about district finances and school facilities. I link national enrollment, demographic, and district finance data to examine where enrollment decline is associated with elevated closure risk and how well that risk can be identified in advance. The share of school-age children in traditional public schools fell from 83.0 percent in 2019–20 to 77.8 percent in 2024–25. The share in private schools or unaccounted for in enrollment data rose from 9.4 to 13.3 percent. Most districts, including most with steep enrollment losses, maintained real spending per pupil. Nonetheless, 730 districts serving 2.3 million students combined enrollment losses of at least 10 percent with federal revenue losses of at least 2 percent of revenue. In six annual out-of-sample tests, the 10 percent of schools with the highest predicted closure risk accounted for 53–63 percent of subsequent closures. Applied to traditional public schools open in 2024–25, the one-year model predicts about 550 closures in 2025–26. The three-year model predicts about 1,700 closures by 2027–28. Risk is concentrated among small schools with declining enrollment and in districts with recent closures. These include districts that maintained spending per pupil. The findings support targeted facility planning, transition support, and monitoring.[1]

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Related work. This paper builds on a series of reports by the author on post-pandemic enrollment. The Hamilton Project at Brookings published Burtis and Goulas (2023) and Goulas (2024a). Another Hamilton Project report, Goulas and Pula (2024), was coauthored with Isabelle Pula. Goulas (2024b) was written for the Thomas B. Fordham Institute. Council, Goulas, and Monachou (2025) was coauthored with Dylan Council and Faidra Monachou for Brookings. Those reports documented where students went. This manuscript adds a school-level model of closure risk, its validation in six successive years, and a state-level closure-pressure index.

[1] An online interactive tool accompanies this paper at `https://closure-pressure.vercel.app`. Readers can look up estimates of school closure risk for specific districts.

1 Introduction

In 2024–25, five years after the onset of COVID-19, public school enrollment in the United States was still shrinking. Between 2019–20 and 2024–25, the shares of school-age children in private, charter, and virtual schools all rose. The share unaccounted for in any enrollment count also increased (Council et al., 2025; Dee, 2023). The smaller birth cohorts born since 2019 are reaching kindergarten age. Federal pandemic relief has expired.

The fiscal consequences of enrollment loss depend on how each funding source adjusts and on how quickly districts can change their costs. State aid typically follows enrollment-based formulas, often with hold-harmless provisions that phase in losses. Local property tax revenue does not fall with enrollment in the short run. Federal Title I allocations depend on counts of children in poverty rather than on enrollment (V. Lee, Gutierrez, & Blagg, 2020). Maintaining revenue per pupil therefore does not necessarily preserve total revenue. Even where spending per pupil is maintained, fewer students can change the number and location of schools a district operates. Many operating costs adjust slowly to enrollment losses. Some are fixed at the building level.

A growing number of districts are closing schools. Closure plans approved in 2026 alone covered more than 120 schools, led by Philadelphia, Tulsa, Houston, and Pittsburgh (Dickason, Beach, Hahnel, & Jacob, 2025; Merod, 2026; The Washington Post, 2026). Displaced students experience lasting setbacks unless they move to better schools (Center for Research on Education Outcomes, 2017; Kim, 2024).

This paper examines where enrollment patterns, demographic change, and district finances predict subsequent school closure. Three questions structure the evidence. The first concerns where students have gone and whether the post-pandemic shift has stabilized. The second concerns how district finances have adjusted to enrollment losses as federal relief winds down. The third concerns how well schools at risk of closure can be identified in advance. To address closure prediction, I develop a school-level model of annual closure risk. I evaluate its predictive performance in six successive years. The model identifies where closure risk is

concentrated. A companion tool provides district-level estimates.

The answers are as follows. First, the share of school-age children in traditional public schools (TPS) fell from 83.0 percent in 2019–20 to 77.8 percent in 2024–25, the lowest level in the study period. The combined share in private schools or unaccounted for in the available enrollment data rose from 9.4 to 13.3 percent. Second, through fiscal year 2024, enrollment losses coincided with increases in total revenue and real spending per pupil in the median district. Nonetheless, 730 districts enrolling 2.3 million students face both a steep enrollment decline and a sizable drop in federal revenue. Third, closure risk is concentrated and predictable. In six annual out-of-sample tests, the 10 percent of schools with the highest predicted risk accounted for 53 to 63 percent of subsequent closures. Applied to traditional public schools open in 2024–25, the one-year model predicts about 550 closures in 2025–26. The three-year model predicts about 1,700 closures by 2027–28. The models identify the states and types of schools where risk is concentrated.

2 Problem Definition

Enrollment decline is used in two distinct senses. A decline in the *number* of students a district enrolls determines its scale and its formula revenue. A decline in the *share* of school-age children enrolled in public schools measures public school participation relative to the population. The enrollment analysis reports shares. The finance analysis uses counts. The closure model uses both. *Permanent closure* means a school that the National Center for Education Statistics (NCES) lists as permanently closed in a given year after listing it as open and operating the year before. *Closure pressure* refers to the conditions that have historically preceded closures, summarized by a school's predicted probability of closing in the following year.

The policy problem has three distinct parts. The first concerns adjustment to fewer students spread across existing buildings. The costs of operating a building change little with the number of students in it (V. Lee et al., 2020). Districts eventually choose between operating

buildings below capacity and consolidating them. Enrollment decline need not produce an immediate reduction in resources per pupil. Before the pandemic, it generally did not (M. H. Lee & Scafidi, 2026). The second concerns total revenue. The size of the revenue loss depends on how each funding source adjusts. Temporary federal relief during 2020–2024 (ESSER) postponed this adjustment for many districts. Its expiration removes that cushion as the smaller cohorts born after 2019 reach kindergarten. The third concerns the costs that students and communities bear when schools close. A common monitoring framework could help states compare closure risk across districts and coordinate planning and transition support.

3 What Is Known

A large literature documents the pandemic enrollment shock and its persistence. Public enrollment fell about 3 percent in 2020–21, with the largest losses in kindergarten and among low-income and Black students (Dee, 2023; Dee & Murphy, 2021; Musaddiq, Stange, Bacher-Hicks, & Goodman, 2022). It had not recovered by 2023–24 (Council et al., 2025; Goulas & Pula, 2024). Bellwether's recent reports quantify the implied revenue loss and warn of a coming wave of closures (Dickason et al., 2025; Hahnel & Willis, 2026). Research on the consequences of closures finds lower attainment and earnings for displaced students, particularly when receiving schools are not better than the closed ones (Kim, 2024; Tieken & Auldridge-Reveles, 2019). Using data for all districts from 1998 to 2019, M. H. Lee and Scafidi (2026) document larger increases in revenue and resources per pupil in districts with declining enrollment than in growing districts. They attribute this pattern to local and federal revenue not falling in proportion to enrollment. This paper examines a different outcome, permanent closure at the school level. It extends the finance description into the pandemic and relief wind-down period. It also evaluates the prediction of recorded closures.

Work on predicting closures is newer. Council et al. (2025) show that schools with the steepest recent enrollment losses are several times more likely to close than schools with stable

enrollment. Chrzan, Pearman, and Domingue (2025) train machine-learning models on district-year data for 2000–2018 to flag districts likely to close at least 10 percent of their schools within five years. Anglum, Rohde-Collins, Jabbari, and Chun (2025) propose a conceptual framework for studying closures. For the closures they examine, NCES closure records and local records disagree in about one in seven cases. This paper advances prior work in three ways. First, it is school-level and annual, producing a ranking of individual schools. Second, it covers the post-pandemic and post-relief years. Predictive performance is validated separately in each of these years. Third, it combines enrollment, geography, county births, and district finances in a single model.

4 New Evidence

4.1 Data

I combine six federal sources, described in the Appendix. The Common Core of Data (CCD) provides school-level enrollment, status, and characteristics for every public school from 2011–12 through 2024–25. The Census Bureau's Small Area Income and Poverty Estimates (SAIPE) provide the number of children aged 5–17 in each district through 2024. The Bureau's county population estimates provide annual births by county from 2001 through 2024. The Private School Universe Survey (PSS) provides private K–12 enrollment in odd school years, now including 2023–24. The Census Bureau's Annual Survey of School System Finances (the F-33 file) provides district revenues by source, spending, debt, and cash holdings for fiscal years 2013 through 2024. Fiscal year 2024 corresponds to school year 2023–24. NCES EDGE geocodes locate each school. The Appendix records when each file became publicly available.

4.2 Enrollment through 2024–25

Figure 1 and Table A1 show the mix of schooling options as shares of the school-age population. The TPS share fell from near 83 percent before the pandemic to 80.1 percent in 2020–21. It continued to slide, reaching 77.8 percent in 2024–25. Traditional public schools enrolled 42.75 million students in 2024–25. This was 300,000 fewer than a year earlier. Enrollment was 2.1 million below its 2019–20 level despite growth in the school-age population. The charter school share rose from 5.5 percent of children in 2019–20 to 6.1 percent. The virtual school share edged up to 1.3 percent.

The larger movement is outside the public sector. Private enrollment, measured directly for 2023–24, stood at 5.10 million K–12 students, or 9.3 percent of children. This was 7.7 percent more than in 2021–22. Children unaccounted for in public or private enrollment counts were 4.3 percent of the population in 2024–25. This residual includes home-schooled children, children in unregistered settings, and measurement error. Because the PSS is biennial, private enrollment in 2024–25 is extrapolated from a linear trend. The split between private and unaccounted-for children in that year is therefore estimated. Their combined share does not depend on that extrapolation because it equals the school-age population less public enrollment. Together these two groups made up 13.3 percent of school-age children. This exceeded the 2021–22 peak of 13.1 percent and was well above the pre-pandemic range of 9.4–9.8 percent. The patterns by community type documented by Council et al. (2025) have continued. The share of children outside TPS reached 35.0 percent in predominantly Black districts in 2024–25. It reached 27.0 percent in high-poverty districts. Both were new highs (Appendix Figures A1 and A2). Across states, the share of children not enrolled in public schools in 2024–25 ranges from 5 percent in Utah to 24 percent in Hawaii (Appendix Figure A3).

4.3 District Finances and the End of Federal Relief

I merge the enrollment panel with the F-33 files for 9,076 traditional districts with at least 500 students in 2019–20. These districts enrolled 43.4 million students in 2024–25 across all of their

schools, including 41.7 million in traditional public schools. The median district lost 4.8 percent of its enrollment between 2019–20 and 2024–25. A total of 1,998 districts (22 percent) lost 10 percent or more.

Through fiscal year 2024, enrollment losses coincided with increases in total district revenue and spending per pupil in the median district. State and local revenue growth offset declining federal revenue. In nominal terms, the median district's total revenue rose 4.6 percent between fiscal years 2023 and 2024. Its current spending per pupil rose 5.6 percent over the same interval. Federal revenue fell in two-thirds of districts as relief wound down. The median district's federal revenue fell by 11 percent.

The pre-pandemic pattern documented by M. H. Lee and Scafidi (2026) continued over the longer interval from fiscal year 2020 to fiscal year 2024, after deflating amounts by the CPI-U. Among districts whose enrollment fell by 10 percent or more, real total revenue was broadly flat in the median district (+0.6 percent). The median increase in real revenue per pupil was 13.7 percent, compared with 3.6 percent in growing districts. The median increase in real current spending per pupil was 10.9 percent, compared with 1.9 percent in growing districts. Among steeply declining districts, 90 percent maintained or increased real spending per pupil (Appendix Table A5). An illustrative calculation multiplies each district's 2019–20 state and local revenue per pupil by its enrollment change, with no allowance for hold-harmless or other formula provisions. Under such a pure per-pupil formula, the enrollment-linked revenue at stake would be 4.3 percent of revenue in the median district.

Exposure is nonetheless concentrated. Table 1 and Figure 2 show the overlap between the two shocks. Of the 1,998 districts with steep enrollment declines, 730 also saw federal revenue fall by at least 2 percent of their total revenue. These districts enroll 2.3 million students. Joint exposure is most common in Louisiana, Arizona, Michigan, Mississippi, Arkansas, and West Virginia. Fiscal year 2024 captures only part of the expiration of federal relief because relief funds could be spent into 2025.

Maintained resources did not prevent closures. Consider districts whose enrollment fell

by 10 percent or more between 2019–20 and 2023–24 and whose real current spending per pupil was maintained or increased from fiscal year 2020 to 2024. Among schools in these districts, 1.16 percent closed in 2024–25. This was two to four times the rate in growing districts (0.3–0.5 percent). The rate was similar in the few steeply declining districts where real spending per pupil fell (1.19 percent, Appendix Table A6). The enrollment-to-closure connection therefore runs through capacity, not only through revenue.

4.4 Permanent Closures through 2024–25

Figure 3 extends the closure series by a year. Among brick-and-mortar traditional public and charter schools, the permanent closure rate fell from 0.99 percent in 2014–15 to 0.61 percent in 2021–22, when many districts suspended closure plans. It returned to 0.78 percent in 2023–24 and was 0.76 percent in 2024–25. For traditional public schools, the 2024–25 rate was 0.67 percent, back at its pre-pandemic level. For charters, it was 1.8 percent, well below the 3 percent typical before 2020. Over the full period, 0.81 percent of schools closed each year, about 7,800 in total.

4.5 Predicting Closures

I estimate the probability that a school open in year t is listed as permanently closed in year $t+1$. The estimation sample covers every regular, non-virtual public school between 2013–14 and 2023–24. It contains 966,343 school-years and 7,809 closures. All predictors are measured in the school-year preceding recorded closure or earlier. Predictors capture school size and enrollment trajectories, school characteristics, proximity to alternative schools, county birth cohorts, district enrollment patterns, and lagged district finances. The Appendix defines each measure. I estimate a logistic regression with year and state fixed effects to describe conditional associations. I use a gradient-boosting classifier to predict closure risk.

I evaluate predictive performance in six annual out-of-sample tests. Each model uses only earlier school-years to predict closures in the held-out year (Table 2, Figure 4 Panel B).

The gradient-boosting model's area under the ROC curve ranges from 0.82 to 0.88 across the six closure years from 2019–20 to 2024–25, against 0.72 to 0.79 for a benchmark that uses only enrollment level and change. The 10 percent of schools with the highest predicted closure risk, hereafter the highest-risk decile, accounted for 53 to 63 percent of the closures that occurred the following year. The observed closure rate in this decile was 3.2 to 4.9 percent, against a base rate below 1 percent. The model consistently concentrates subsequent closures in the highest-risk decile. Calibration varies across years. The model expected more closures than occurred in 2020–21 through 2022–23. The largest discrepancy was in 2021–22, with 933 predicted closures against 539 observed. In 2023–24, it expected fewer closures than occurred, with 612 predicted against 683 observed.

Because facility planning works on a multi-year horizon, I also estimate the probability that a school closes within three years. Closure can occur in $t+1$, $t+2$, or $t+3$. The outcome occurs in 2.3 percent of school-years in the 2013–14 to 2021–22 cohorts. I validate the model on five holdout cohorts whose windows end in 2020–21 through 2024–25. Each model is estimated only on cohorts whose windows were fully observed. The three-year model has an AUC of 0.82 to 0.84. It places 48 to 52 percent of closures in the highest-risk decile. It over-predicted closure counts in the windows that overlap the pandemic pause (Appendix Table A7). Applied to traditional public schools open in 2024–25, it implies about 1,700 closures by 2027–28, or 2.1 percent of schools. Its state ranking is close to the one-year ranking, with a rank correlation of 0.94 (Appendix Table A8).

Figure 4, Panel A, and Appendix Table A2 identify characteristics associated with closure. Larger enrollment, greater distance from alternative schools, enrollment near the school's own peak, and location in a larger district (given its number of schools) are associated with lower closure risk. A one-year enrollment drop is associated with higher odds of closure. A one-standard-deviation decline in county births for the cohort about to enter kindergarten, relative to the cohort five years older, is associated with 5 percent higher odds of closure. Closure is more likely for charter schools, schools open fewer than three years, middle schools, rural and town

schools, schools in districts that closed schools the year before, and schools in districts in which a larger share of children is outside traditional public schools. Among the finance variables, higher federal and state revenue shares and a higher capital-outlay share are associated with higher odds. A drop in federal revenue is associated with modestly higher odds. Total revenue growth, reserves, and debt are not statistically associated with closure conditional on the other covariates. Enrollment trajectories, school size, geography, and demography account for most of the model's predictive information. Several measures of district finances provide limited additional information conditional on these characteristics.

4.6 Where Closure Pressure Is Highest

I refit the models on all observed cohorts. I apply them to the 80,488 traditional public schools open in 2024–25 to obtain school-level closure probabilities for 2025–26 and by 2027–28. The one-year probabilities sum to about 550 closures, or 0.68 percent of schools. This rate equals the average closure rate of traditional public schools since 2014–15. The predicted total is slightly above the 538 closures recorded in 2024–25. The three-year probabilities sum to about 1,700 closures by 2027–28, or 2.1 percent of schools. This is slightly above the 1.9 percent of schools that closed within three years in earlier cohorts. Including charter schools, the totals are about 690 and 2,100. Holding the county-birth measures at their 2023–24 values lowers the one-year total by about 3 percent. This difference accounts for most of the small increase over 2024–25.

Figure 5, Panel A, maps the three-year index for traditional public schools by state. Panel B shows its difference from each state's own historical three-year closure rate to separate new pressure from long-standing patterns. Appendix Table A8 gives the values for both panels. Appendix Table A3 and Figures A4 and A5 give the one-year equivalents. Three-year pressure is highest in Arkansas, Mississippi, and West Virginia, where 4.3–4.6 percent of traditional public schools are expected to close by 2027–28. Maine, Rhode Island, Iowa, Louisiana, Indiana, South Carolina, and Pennsylvania follow at 3.1–3.7 percent. The one-year ranking is similar. Most of these states also closed schools at above-average rates over the past decade. Part of

their predicted risk therefore reflects persistent differences across states. Predicted three-year risk exceeds the state's own history by the widest margin in Texas, at 1.3 percentage points. The next-largest differences are in South Carolina, West Virginia, Delaware, Florida, and Indiana, at 0.6–0.8 points. Mississippi, Maine, Nebraska, and Wyoming are predicted to close schools at a lower rate than historically. Pressure is lowest in Hawaii, Nevada, Montana, Idaho, and California.

4.7 Limitations

Three limitations bear on how the results should be read. First, closure is defined by annual NCES status records. The index therefore predicts recorded status changes. Anglum et al. (2025) find that NCES and local records disagree for about one in seven of the closures they examine. This comparison is specific to their sample but indicates measurement error in the outcome. Second, the finance measures available when scoring 2024–25 are from fiscal year 2024, one year earlier than the enrollment measures. They reflect only part of the expiration of federal relief. Third, schools open fewer than three years and schools with fewer than 25 students receive the highest individual probabilities. Schools open fewer than three years are 1.9 percent of schools open in 2024–25 but 5 percent of predicted closures. Schools with fewer than 25 students are 1.6 percent of schools but 10 percent of predicted closures. Re-estimating and re-validating the model without these groups leaves ranking performance essentially unchanged. The AUC ranges from 0.82 to 0.87. The highest-risk decile contains 52–60 percent of closures. The predicted total for all public schools falls from 693 to 645 under the first restriction, 652 under the second, and 578 under both. For traditional public schools, it falls from 546 to 525, 519, and 467. State means remain highly correlated with the baseline, with rank correlations of 0.91–0.98. West Virginia, Arkansas, and Iowa are in the top five in every sample (Appendix Table A4). The ranking is robust to the treatment of these schools. The predicted national total depends on whether they are included. I therefore emphasize state-level aggregates and the ranking of established schools over the predicted national total.

5 Policy Alternatives

The planning challenge is to align school capacity with enrollment while protecting students during transitions. The evidence identifies where closure risk is concentrated. It also identifies where enrollment losses overlap with declining federal revenue. These findings do not show that every district faces revenue losses. Real spending per pupil has risen in most declining districts. Three planning needs are distinct. The first is adjustment to reduced enrollment spread across existing facilities. The second is addressing actual losses of district revenue. The third is managing the costs students face when schools close. I group the options into four areas and note the trade-offs.

Funding-formula design. Many states cushion enrollment-based aid with declining-enrollment adjustments or hold-harmless provisions that phase in losses over several years. Many also have sparsity adjustments for small isolated schools. The findings identify conditions relevant to the design of such provisions. Closures are least likely where the nearest alternative is far away. This analysis does not estimate the effects of these provisions. Phase-ins buy time for orderly planning. Their cost is delayed adjustment. A targeted alternative is to recognize fixed costs explicitly for schools above a distance threshold while letting aid follow students elsewhere.

Early warning and planning requirements. States could publish, or require districts to publish, multi-year facility plans that use leading indicators of the kind in this paper—enrollment relative to capacity, cohort size from births, proximity of alternatives—rather than waiting for a budget shortfall. The index provides a common measure of closure risk that can inform facility planning, community consultation, and transition support. District leaders can use the companion tool to find estimates for their own districts. Its predictive performance is evaluated against subsequent recorded closures, over one year and over three, the horizon of a facility plan. Evaluating the benefits and costs of an individual closure requires additional information on receiving schools, transportation, student needs, and local conditions.

Transition supports and process standards. Displaced students fare worse when they move to schools no better than the ones that closed. States can therefore condition consolidation

support on transition plans. These plans can address receiving-school quality, transportation, continuity of staff, and support for students with disabilities. Process standards include advance notice, published criteria, and community engagement. They raise the cost of closing a school. They also reduce the cost borne by families. The results identify where demand for these standards is likely to be greatest.

Accounting for children outside public systems. More than one in eight school-age children is now in private school or unaccounted for in the available enrollment data. The residual is constructed from aggregate counts. It combines schooling choices with gaps in enrollment coverage and measurement error. More consistent reporting of private enrollment and home schooling would help distinguish the two. Better data would also improve closure planning because the district share of children outside traditional public schools is itself a predictor in the closure model.

6 Policy Implications

Three implications follow. First, the models predict closures of traditional public schools at rates slightly above recent experience. The one-year model predicts about 550 closures in 2025–26. The three-year model predicts about 1,700 closures by 2027–28. Second, the risk is concentrated and predictable. The highest-risk decile accounts for more than half of closures. The model identifies states and district types where closure risk is concentrated. This makes targeted support feasible in a way that across-the-board hold-harmless aid is not. Third, the fiscal picture is one of concentrated exposure rather than uniform deterioration. Through fiscal year 2024, most districts, including most with steep enrollment losses, maintained real spending per pupil. Fiscal attention is warranted first in the 730 jointly exposed districts. These districts combine steep enrollment losses with a sizable drop in federal revenue. Concentrated and predictable closure risk creates an opportunity to target planning assistance and transition support to the schools and communities most likely to face disruption.

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Table 1: Districts by Enrollment Change (2019–20 to 2024–25) and Change in Federal Revenue (FY2023 to FY2024)

Enrollment change, 2019–20 to 2024–25	Change in federal revenue, FY2023 to FY2024			All
	Fell $\geq 2\%$ of revenue	Fell $< 2\%$ of revenue	Flat or up	
Steep decline ($\leq -10\%$)	730 (2.3)	520 (3.0)	748 (2.6)	1,998 (7.9)
Moderate decline (-10 to -5%)	853 (3.1)	735 (3.8)	848 (5.3)	2,436 (12.3)
Small decline (-5 to 0%)	821 (3.3)	755 (4.3)	781 (4.6)	2,357 (12.3)
Growing	773 (2.9)	769 (4.5)	743 (3.6)	2,285 (11.0)
All districts	3,177 (11.6)	2,779 (15.7)	3,120 (16.1)	9,076 (43.4)

Notes: Number of districts (millions of students in 2024–25 in parentheses). Student counts include all schools that report under the district, including its charter, virtual, and alternative schools. Traditional school districts with at least 500 students in 2019–20 and F-33 data for fiscal years 2023 and 2024. Federal revenue change is expressed as a share of fiscal year 2023 total revenue.

Sources: Common Core of Data (NCES). Annual Survey of School System Finances (U.S. Census Bureau). Author's calculations.

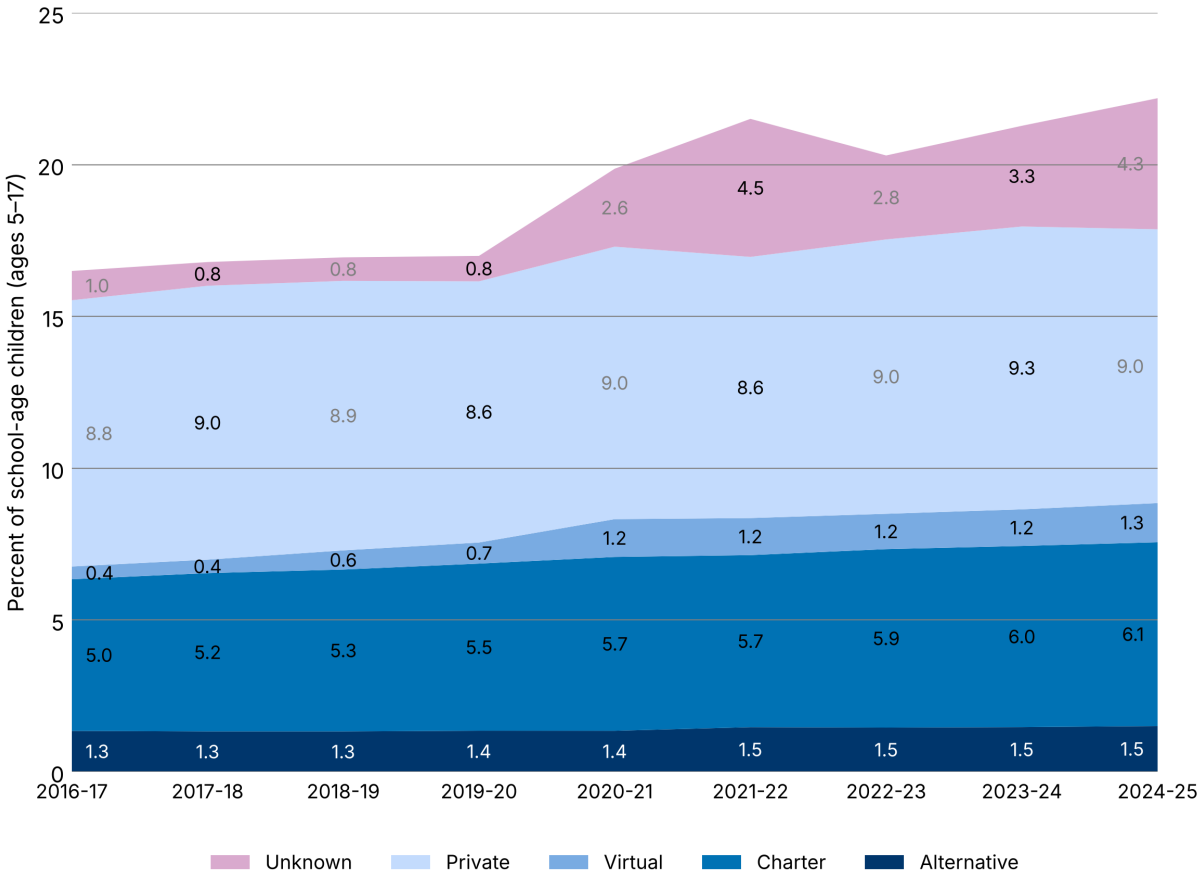
Table 2: Out-of-Sample Performance of the Closure Model by Holdout Year

Closure year	Closures	Base rate (%)	AUC			Top risk decile (gradient boosting)		
			Enrollment only	Logit, full	Gradient boosting	Share of closures (%)	Predicted / observed rate (%)	Expected / observed closures
2019-20	758	0.86	0.779	0.831	0.860	57	5.3 / 4.9	752 / 758
2020-21	635	0.72	0.779	0.826	0.861	60	5.6 / 4.3	761 / 635
2021-22	539	0.61	0.720	0.789	0.822	53	6.5 / 3.2	933 / 539
2022-23	551	0.63	0.761	0.821	0.858	60	5.2 / 3.7	759 / 551
2023-24	683	0.78	0.794	0.829	0.875	63	4.3 / 4.9	612 / 683
2024-25	665	0.76	0.754	0.813	0.854	57	4.5 / 4.3	648 / 665

Notes: For each closure year, models are estimated on school-years ending at least two years earlier (e.g., the 2024–25 row uses 2013–14 through 2022–23) and applied to schools open the year before the closure year. AUC is the area under the ROC curve. The top risk decile is the 10 percent of schools with the highest predicted probability. "Enrollment only" is a logit using enrollment level and its one- and three-year changes. "Logit, full" and "gradient boosting" use all predictors.

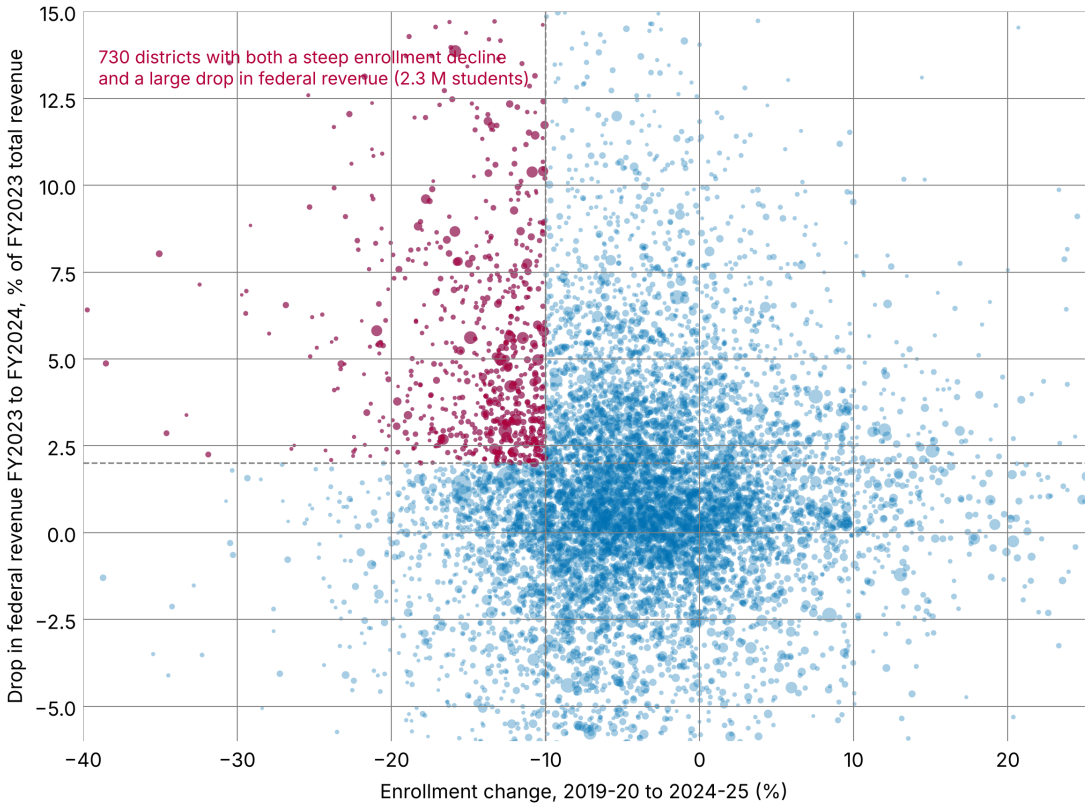
Sources: Common Core of Data and EDGE (NCES). SAIPE, county population estimates, and F-33 (U.S. Census Bureau). Author's calculations.

Figure 1: Share of School-Age Children Outside Traditional Public Schools, by Type, 2016–17 to 2024–25



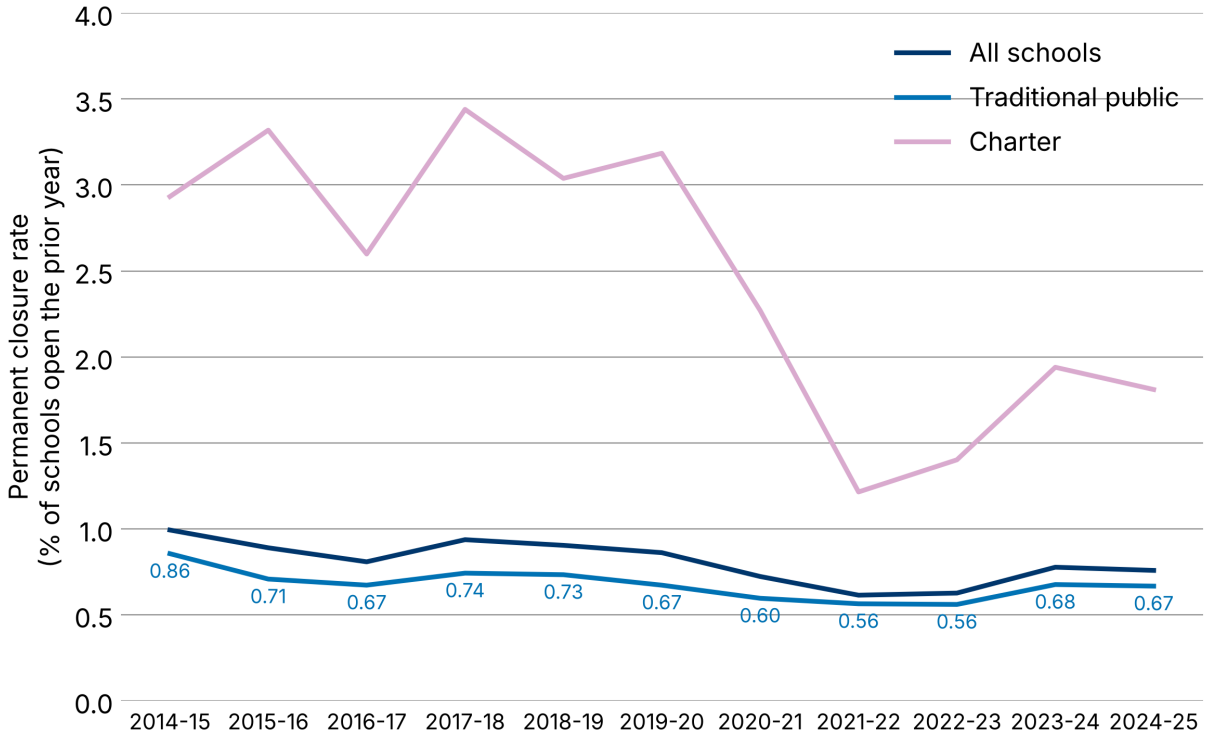
Notes: Percent of children aged 5–17 in districts matched to SAIPE. "Unknown" is the population less public and private enrollment. Private enrollment is measured in odd years by the PSS (2023–24 included). It is estimated from a linear trend in even years and 2024–25. Estimated values are labeled in grey. The traditional public school share was 77.8 percent in 2024–25. *Sources:* Common Core of Data and Private School Universe Survey (NCES). SAIPE (U.S. Census Bureau). Author's calculations.

Figure 2: Enrollment Change and the Drop in Federal Revenue, by District



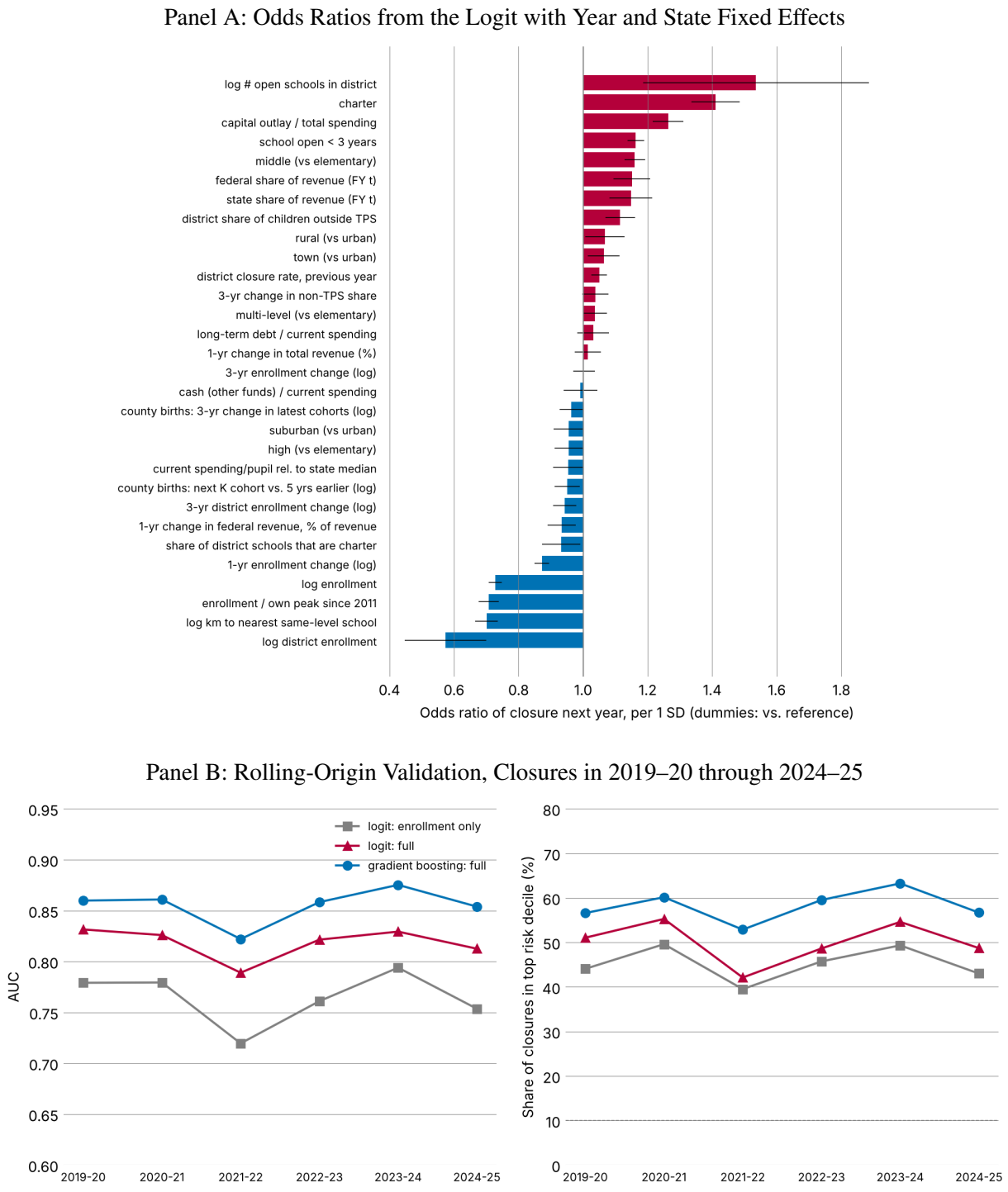
Notes: Traditional school districts with at least 500 students in 2019–20 (N = 9,076). Marker size is proportional to 2024–25 enrollment. Red markers identify districts with enrollment losses of at least 10 percent between 2019–20 and 2024–25 and federal revenue losses of at least 2 percent of fiscal year 2023 total revenue. *Sources:* Common Core of Data (NCES). F-33 (U.S. Census Bureau). Author's calculations.

Figure 3: Permanent School Closure Rate, 2014–15 to 2024–25



Notes: Schools listed as permanently closed in a year as a percent of regular, non-virtual schools open the year before. Alternative and exclusively virtual schools are excluded. *Source:* Common Core of Data (NCES). Author's calculations.

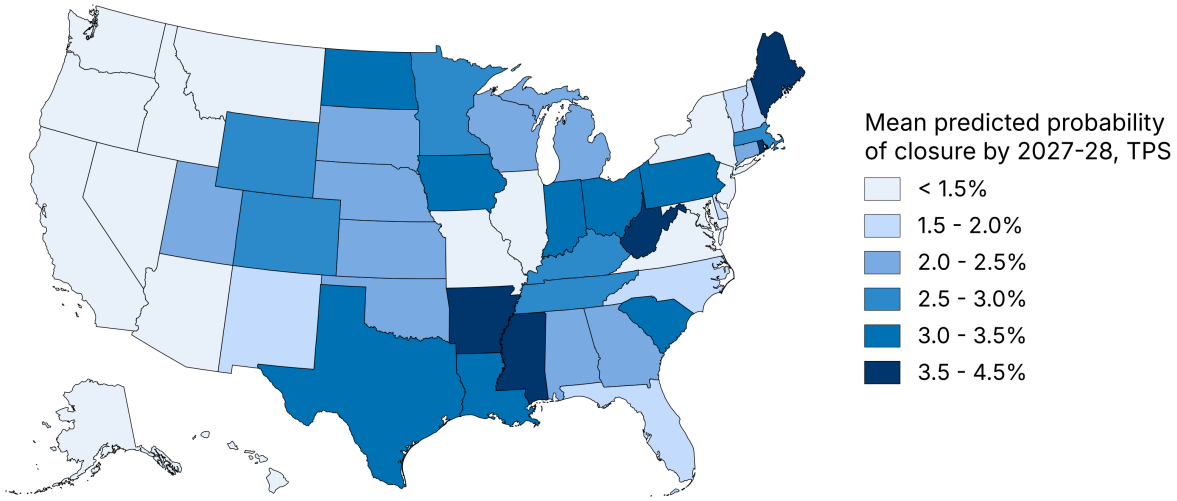
Figure 4: Predictors and Annual Predictive Performance of the Closure Model



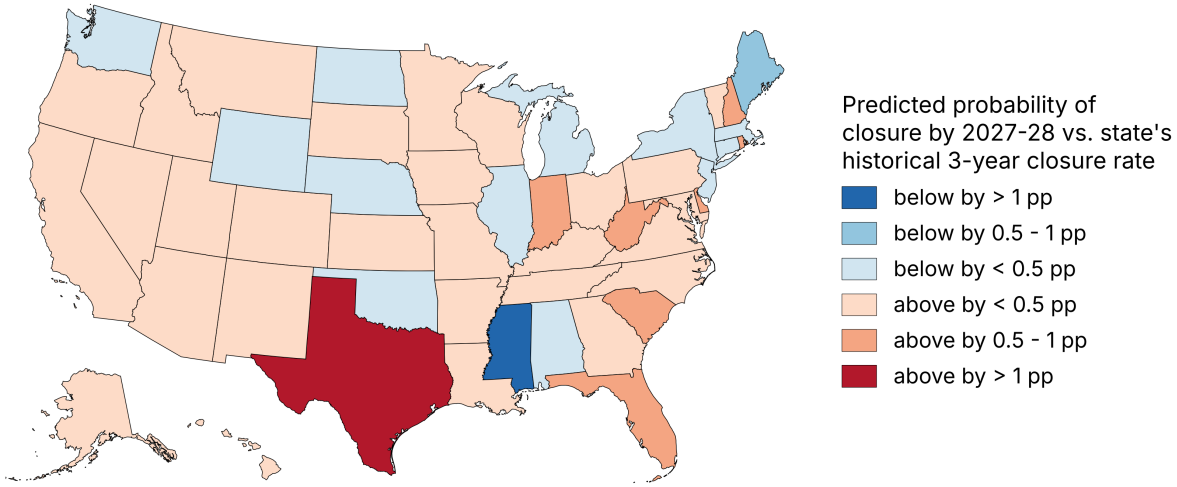
Notes: Panel A reports odds of permanent closure in the following year per one standard deviation of each predictor. Indicator variables are relative to the reference category. Estimates use 2013–14 to 2023–24 data with standard errors clustered by district. Bars show 95 percent confidence intervals. In Panel B, each point represents a model estimated only on years before the holdout year. It is applied to schools open the year before the closure year. *Sources:* see Table 2.

Figure 5: Closure Pressure on Traditional Public Schools by State: Predicted Probability of Closure by 2027–28 and Change from Each State's Own History

Panel A: Mean Predicted Probability of Closure by 2027–28 (Three-Year Index)



Panel B: Predicted Three-Year Probability Minus the State's Own Historical Three-Year Closure Rate



Notes: Traditional public schools only. Panel A averages the three-year gradient-boosting model's predicted probabilities over schools open in 2024–25. Panel B subtracts the share of each state's schools open in a cohort year that closed within three years, pooled over cohorts 2013–14 to 2021–22. Red states face more pressure than their own history. Blue states face less. Appendix Table A8 gives the values. Appendix Figure A5 shows the one-year equivalents. *Source:* Common Core of Data (NCES). Author's calculations.

Appendix: Data and Methods

Enrollment Shares

School-level CCD files for 2011–12 through 2024–25 are cleaned identically in every year. K–12 membership is the sum of grade subtotals excluding prekindergarten, adult, ungraded, and grade 13 students. Schools in outlying areas are dropped. New York City's geographic districts are combined. Schools with a non-regular school type are classified as alternative. Among regular schools, those flagged fully virtual are classified as virtual. The remaining schools flagged charter are classified as charter. All other regular schools are classified as traditional public. Counts by type include only open and operating schools. The school-age population is the SAIPE estimate of children aged 5–17 summed over districts that match a CCD district. These districts account for 93 percent of public students in 2024–25. A district's population is set to its public enrollment where the latter is larger. Private enrollment is PSS K–12 enrollment. The Digest of Education Statistics Table 205.20 supplies the data through 2021–22. The 2023–24 First Look supplies the data for 2023–24. A linear trend through all PSS years fills 2016–17, 2018–19, 2020–21, 2022–23, and 2024–25. The breakdowns by race/ethnicity and poverty use district composition in 2016–17 and the 2016–19 average SAIPE child poverty rate. Group membership is therefore fixed over time.

District Finances

The F-33 individual-unit files are restricted to operating elementary and secondary school systems. They are matched to the CCD by NCES district identifier. Amounts in the main text are nominal unless labeled real. Real changes deflate fiscal year 2020 amounts to fiscal year 2024 dollars using the CPI-U annual averages of 258.811 and 313.689. Charter schools run by non-governmental operators are outside the scope of the F-33. The finance analysis is therefore limited to traditional districts. Table A5 uses the districts in Table 1 that also have F-33 records for fiscal year 2020 (9,072 of 9,076). It groups districts by enrollment change over 2019–20 to

2024–25. It reports median real changes over fiscal years 2020 to 2024 (school years 2019–20 to 2023–24). The finance interval therefore ends one year before the enrollment interval. Per-pupil amounts use the F-33 fall enrollment count. Table A6 classifies districts by enrollment change over 2019–20 to 2023–24 and by the real change in current spending per pupil over the same fiscal years. Both measures are dated before the closure outcome. The table reports closures in 2024–25 among regular, non-virtual schools open in 2023–24. The matched sample contains 75,320 schools.

County Births

Annual births by county come from the components of change in the Census Bureau's county population estimates. I use vintage 2009 for 2001–2009, vintage 2019 for 2011–2019, and vintage 2024 for 2021–2024. The files contain partial years for 2010 and 2020. I interpolate those years. Schools are assigned to counties using EDGE. The cohort variable is the log ratio of births four years before year t (the cohort entering kindergarten in $t+1$) to births nine years before. The trend variable is the log ratio of births one year before to births four years before.

Closure Model

The estimation sample consists of regular (non-alternative), non-virtual public schools that ever reported positive enrollment and are open and operating in year t, for t = 2013–14 through 2023–24. The outcome equals one if the school is listed as permanently closed in $t+1$. A consolidation in which the surviving building keeps its identifier appears as the closure of the other building. A reorganization that re-codes a continuing school under a new identifier can appear as a closure and an opening. Late-recorded closures are attributed to the year of recording. Locale follows the convention of Council et al. (2025) (a school ever coded urban is urban, otherwise ever suburban, and so on). For schools new in 2024–25, locale is taken from the 2023–24 EDGE file. Distance to the nearest open school serving the same grade level is computed among schools open in the same year, regardless of district. District finance variables come from the fiscal year ending

before year t begins.

Distance and county-birth measures are missing for schools absent from the EDGE geocode files. In 2013–14 and 2014–15, these are mostly schools that closed before the first EDGE file was produced. In 2024–25, they are schools that opened after the newest file. Missing values are filled from other schools in the same district and year, using the same grade level for distance. The next source is schools in the same state and year. Substituting the training-sample median instead turns a missing geocode into a constant that the models learn as a closure signal. They then apply that signal to new schools in 2024–25. Continuous predictors are winsorized at the 0.5th and 99.5th percentiles. Remaining missing values are set to the training-sample median.

The logit includes year and state fixed effects. It is estimated on all closures and a 25 percent random sample of non-closures. The intercept is corrected for the sampling rate. Standard errors are clustered by district. The gradient-boosting classifier (histogram-based, 400 trees, learning rate 0.05, at least 200 observations per leaf, state as a categorical feature) is fitted on the full sample. For the rolling validation, both models are estimated on years up to two years before each closure year. For the index, they are re-estimated on all years. They are applied to schools open in 2024–25 with fiscal year 2024 finances.

The three-year outcome equals one if the school is listed as permanently closed in $t+1$, $t+2$, or $t+3$. Closure in $t+2$ or $t+3$ is identified from the school's own record in $t+1$ or $t+2$. The school must therefore remain in the regular, non-virtual universe for a later closure to count. Schools that leave the CCD without a closure record are treated as not closed, as for the one-year outcome. The three-year model uses cohorts 2013–14 through 2021–22. Their windows end by 2024–25. In the rolling validation, the model for holdout cohort t is estimated on cohorts through $t-3$. Their windows are fully observed by t. The first holdout cohort (2017–18) is the earliest with two training cohorts. Replication code and the school- and district-level index are available from the author.

Sensitivity to New and Very Small Schools

Table A4 examines three sample restrictions. The first excludes schools open fewer than three years or without three years of enrollment history. The second excludes schools with fewer than 25 students. The third applies both restrictions. For each sample, I re-estimate the gradient-boosting model. I repeat the validation exercises. The table reports validation performance, predicted 2025–26 closure totals, and the resulting state means and rankings.

Information Dates

The files used to score 2024–25 became publicly available at different times. The preliminary 2024–25 CCD directory and membership files were released in December 2025. SAIPE 2024 was released in December 2025. The vintage 2024 county population estimates were released in 2025. The F-33 file for fiscal year 2024 was released in May 2026 (U.S. Census Bureau, 2026). The 2023–24 PSS First Look was released in 2026 (National Center for Education Statistics, 2026). All files were therefore available before the end of the 2025–26 school year. Most closure decisions for 2025–26 had already been taken by then. Districts typically finalize closures in the winter and spring preceding the school year. The 2025–26 application uses lagged administrative data under the same information convention as the validation exercises. It is not a forecast issued in advance of those decisions. A real-time early-warning use would rely on the same predictors as they become available in states' own records. Those records generally precede the federal releases.

Table A1: School-Age Children by Enrollment Type, 2015–16 to 2024–25

School year	Children 5–17	Traditional public	Charter	Alternative	Virtual	Private	Unknown
2015-16	54.17	45.30 (83.6)	2.56 (4.7)	0.73 (1.3)	0.21 (0.4)	4.90 (9.1)	0.47 (0.9)
2016-17	54.23	45.28 (83.5)	2.71 (5.0)	0.73 (1.3)	0.23 (0.4)	4.76 (8.8)	0.52 (1.0)
2017-18	54.29	45.17 (83.2)	2.83 (5.2)	0.72 (1.3)	0.24 (0.4)	4.90 (9.0)	0.42 (0.8)
2018-19	54.13	44.96 (83.1)	2.89 (5.3)	0.72 (1.3)	0.34 (0.6)	4.81 (8.9)	0.42 (0.8)
2019-20	54.08	44.89 (83.0)	2.98 (5.5)	0.73 (1.4)	0.38 (0.7)	4.65 (8.6)	0.45 (0.8)
2020-21	54.11	43.36 (80.1)	3.10 (5.7)	0.73 (1.4)	0.67 (1.2)	4.86 (9.0)	1.39 (2.6)
2021-22	55.00	43.17 (78.5)	3.12 (5.7)	0.81 (1.5)	0.67 (1.2)	4.73 (8.6)	2.50 (4.5)
2022-23	54.27	43.26 (79.7)	3.19 (5.9)	0.79 (1.5)	0.63 (1.2)	4.91 (9.0)	1.50 (2.8)
2023-24	54.69	43.06 (78.7)	3.26 (6.0)	0.81 (1.5)	0.66 (1.2)	5.10 (9.3)	1.81 (3.3)
2024-25	54.94	42.75 (77.8)	3.33 (6.1)	0.83 (1.5)	0.71 (1.3)	4.96 (9.0)	2.37 (4.3)

Notes: Counts are in millions of children. Percentages of all children aged 5–17 appear in parentheses. Children 5–17 are from SAIPE, summed over districts matched to the CCD. Private enrollment is from the PSS in odd years (K–12, excluding prekindergarten). It is estimated from a linear trend in 2016–17, 2018–19, 2020–21, 2022–23, and 2024–25.

Table A2: Logit Estimates: Odds of Permanent Closure in the Following Year

Predictor (standardized)	Odds ratio per 1 SD	95% CI
School		
log enrollment	0.728***	[0.708, 0.749]
1-yr enrollment change (log)	0.872***	[0.850, 0.895]
3-yr enrollment change (log)	1.003	[0.970, 1.036]
enrollment /own peak since 2011	0.707***	[0.677, 0.739]
school open $<$ 3 years	1.163***	[1.138, 1.189]
middle (vs elementary)	1.160***	[1.128, 1.193]
high (vs elementary)	0.955**	[0.913, 1.000]
multi-level (vs elementary)	1.036**	[1.000, 1.074]
charter	1.411***	[1.337, 1.488]
suburban (vs urban)	0.956*	[0.910, 1.003]
town (vs urban)	1.064***	[1.016, 1.114]
rural (vs urban)	1.068**	[1.009, 1.130]
log km to nearest same-level school	0.701***	[0.667, 0.736]
County births		
county births: next K cohort vs. 5 yrs earlier (log)	0.951**	[0.913, 0.990]
county births: 3-yr change in latest cohorts (log)	0.963**	[0.928, 0.999]
District		
log district enrollment	0.574***	[0.461, 0.714]
3-yr district enrollment change (log)	0.943***	[0.908, 0.980]
district share of children outside TPS	1.114***	[1.069, 1.161]
3-yr change in non-TPS share	1.038*	[0.999, 1.080]
district closure rate, previous year	1.050***	[1.026, 1.074]
log # open schools in district	1.536***	[1.225, 1.925]
share of district schools that are charter	0.932**	[0.875, 0.993]
District finances (F-33, prior fiscal year)		
federal share of revenue (FY t)	1.151***	[1.096, 1.209]
state share of revenue (FY t)	1.148***	[1.084, 1.216]
current spending/pupil rel. to state median	0.954*	[0.908, 1.002]
1-yr change in federal revenue, % of revenue	0.934***	[0.892, 0.978]
1-yr change in total revenue (%)	1.015	[0.975, 1.056]
cash (other funds) /current spending	0.992	[0.941, 1.045]
long-term debt /current spending	1.031	[0.983, 1.082]
capital outlay /total spending	1.263***	[1.217, 1.311]

Notes: Estimated on 2013–14 to 2023–24 with year and state fixed effects. Standard errors are clustered by district. Indicator variables are relative to elementary schools and urban locale. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Traditional Public Schools by State: Historical and 2024–25 Closure Rates and the 2025–26 Closure-Pressure Index

State	Schools 2024–25	Avg. closure rate 2014–15 to 2024–25 (%)	Closure rate 2024–25 (%)	Mean predicted probability 2025–26 (%)	Expected closures 2025–26	Share of schools in national top decile (%)
West Virginia	621	1.28	2.54	1.75	10.8	27.7
Arkansas	946	1.59	0.84	1.50	14.1	23.0
Iowa	1253	1.13	1.04	1.48	18.6	19.4
Mississippi	840	2.02	1.65	1.30	10.9	23.3
Rhode Island	250	1.06	0.80	1.23	3.1	21.3
Ohio	2968	1.34	0.70	1.19	35.2	17.1
Wyoming	308	1.06	0.65	1.13	3.5	20.2
Louisiana	1113	1.37	0.89	1.11	12.3	19.2
Maine	548	1.34	0.72	1.08	5.9	15.3
South Dakota	633	1.05	1.10	1.06	6.7	14.5
North Dakota	476	1.15	1.05	1.03	4.9	12.2
South Carolina	1096	0.95	1.00	0.99	10.8	16.3
Indiana	1683	1.00	0.24	0.91	15.3	13.6
Texas	7386	0.69	0.95	0.86	63.7	12.6
Pennsylvania	2655	0.98	0.26	0.86	22.9	12.6
Minnesota	1441	1.10	0.90	0.84	12.1	15.0
Michigan	2539	1.16	0.94	0.83	21.0	13.4
Kentucky	1162	0.73	0.17	0.82	9.5	14.8
Nebraska	953	1.06	1.36	0.81	7.8	10.3
Colorado	1436	1.02	0.55	0.79	11.3	11.1
Wisconsin	1804	1.02	1.15	0.76	13.7	14.1
Massachusetts	1607	0.94	0.80	0.75	12.0	8.1
Connecticut	945	0.80	1.16	0.73	6.9	10.2
Georgia	2181	0.77	0.64	0.72	15.7	11.3
Tennessee	1638	1.08	0.24	0.72	11.9	12.0
Utah	825	0.58	0.97	0.70	5.8	8.2
Kansas	1266	0.79	0.78	0.70	8.9	8.8
Alaska	410	0.45	2.16	0.69	2.8	6.8
Alabama	1321	0.82	0.38	0.66	8.7	7.0
New Hampshire	444	0.70	2.23	0.62	2.8	9.9
Oklahoma	1690	0.99	0.30	0.60	10.1	9.2
New Mexico	708	0.65	0.42	0.59	4.2	9.1
Missouri	2081	0.53	1.00	0.55	11.4	7.7
Vermont	288	0.68	0.69	0.53	1.5	2.8
North Carolina	2346	0.62	0.85	0.51	11.9	6.6
Illinois	3627	0.69	0.39	0.51	18.5	6.0
New York	4252	0.56	0.70	0.45	19.3	5.2
Virginia	1802	0.41	0.77	0.44	7.9	5.1
Oregon	1099	0.55	0.45	0.44	4.8	5.4
Idaho	614	0.37	1.33	0.43	2.6	5.7
Maryland	1258	0.49	0.40	0.42	5.3	4.4
New Jersey	2235	0.58	0.49	0.38	8.5	4.5
Florida	2793	0.80	0.32	0.37	10.3	8.9
Delaware	179	0.46	0.00	0.36	0.7	3.9
Washington	2014	0.52	0.40	0.35	7.1	4.3
Arizona	1375	0.71	0.00	0.35	4.8	7.1
California	7619	0.59	0.28	0.31	23.9	5.6
Montana	821	0.18	0.37	0.26	2.2	1.3
District of Columbia	111	1.32	0.00	0.11	0.1	15.1
Nevada	572	0.11	0.00	0.09	0.5	1.3
Hawaii	256	0.06	0.00	0.06	0.1	0.3

Notes: Traditional public schools only, sorted by the mean predicted closure probability. The top risk decile is defined over all public schools (traditional and charter).

Table A4: Sensitivity of the Closure Model to New and Very Small Schools

Sample	Schools scored	AUC (6 years)	Closures in top decile (%)	Expected closures (all / TPS)	Mean prob. TPS (%)	Rank corr. with baseline	Five highest states (TPS)
All schools (baseline)	87,496	0.82–0.88	53–63	693 / 546	0.68	1.00	WV, AR, IA, MS, RI
At least 3 years of history	85,784	0.83–0.87	52–59	645 / 525	0.66	0.98	RI, WV, AR, IA, ME
At least 25 students	86,103	0.82–0.86	53–58	652 / 519	0.66	0.95	RI, AR, WV, MS, IA
Both restrictions	84,496	0.83–0.86	53–60	578 / 467	0.60	0.91	AR, WV, IA, RI, LA

Notes: Each row uses a restricted sample. The gradient-boosting model is re-estimated on that sample. The six annual out-of-sample tests of Table 2 are repeated. Schools open in 2024–25 that satisfy the restriction are rescored. "At least 3 years of history" excludes schools open fewer than three years or without three years of enrollment history. "At least 25 students" excludes schools with fewer than 25 students in 2024–25. The rank correlation is the Spearman correlation between state mean predicted probabilities (traditional public schools) in the restricted and baseline samples.

Table A5: Real Changes in District Finances, Fiscal Years 2020 to 2024, by Enrollment Change 2019–20 to 2024–25

Enrollment change	Districts	Students 2024–25 (mill.)	F-33 enroll.	Median real change, FY2020 to FY2024 (%)							Spending per pupil maintained (% of districts)
				Total revenue	Revenue per pupil	Current spending	Current spending per pupil	State revenue	Local revenue	Federal revenue	
Steep decline ($\leq -10\%$)	1,997	7.9	-10.9	+0.6	+13.7	-1.6	+10.9	-6.5	-1.6	+56.0	90
Moderate decline (-10 to -5%)	2,435	12.3	-5.9	+1.9	+8.2	+0.1	+6.3	-3.3	-0.6	+59.7	80
Small decline (-5 to 0%)	2,357	12.3	-2.2	+3.4	+5.8	+1.7	+4.0	0.0	-0.9	+57.2	71
Growing	2,283	11.0	+3.5	+8.6	+3.6	+6.3	+1.9	+6.2	+3.4	+54.2	60
All districts	9,072	43.4	-3.9	+3.6	+7.5	+1.8	+5.3	-0.6	-0.1	+56.8	75

Notes: Districts in Table 1 (traditional districts with at least 500 students in 2019–20 and F-33 records in fiscal years 2023 and 2024) that also have F-33 records in fiscal year 2020. This requirement leaves 9,072 of the 9,076 districts. Medians across districts (district-weighted). The last column is the percent of districts whose real current spending per pupil was unchanged or higher. Amounts deflated to fiscal year 2024 dollars with the CPI-U. Enrollment groups use CCD enrollment change from 2019–20 to 2024–25. The finance interval ends one year earlier. Per-pupil amounts use F-33 fall enrollment. Federal revenue in fiscal year 2024 still includes pandemic relief.

Sources: Common Core of Data (NCES). Annual Survey of School System Finances (U.S. Census Bureau). Bureau of Labor Statistics. Author's calculations.

Table A6: Closure Rates in 2024–25 by District Enrollment Change and Change in Real Spending per Pupil

Enrollment change 2019–20 to 2023–24	Real current spending per pupil, FY2020–FY2024	Districts	Schools open 2023–24	Closed 2024–25	Closure rate (%)
Steep decline ($\leq -10\%$)	Fell	94	506	6	1.19
Steep decline ($\leq -10\%$)	Maintained or increased	1,254	11,217	130	1.16
Moderate decline (-10 to -5%)	Fell	424	2,795	48	1.72
Moderate decline (-10 to -5%)	Maintained or increased	2,027	19,518	146	0.75
Small decline (-5 to 0%)	Fell	778	4,704	29	0.62
Small decline (-5 to 0%)	Maintained or increased	2,085	19,562	84	0.43
Growing	Fell	1,003	6,026	31	0.51
Growing	Maintained or increased	1,404	10,992	32	0.29
All districts	Fell	2,299	14,031	114	0.81
All districts	Maintained or increased	6,770	61,289	392	0.64

Notes: Regular, non-virtual public schools (traditional and charter) open in 2023–24 in the districts of Table A5. Both district measures are dated before the closure outcome. The enrollment window therefore ends in 2023–24, one year earlier than in Table A5. Under this window, 93 percent of steeply declining districts maintained or increased real current spending per pupil, compared with 90 percent in Table A5. "Maintained or increased" means the real change in current spending per pupil was zero or positive.
Sources: Common Core of Data (NCES). Annual Survey of School System Finances (U.S. Census Bureau). Bureau of Labor Statistics. Author's calculations.

Table A7: Out-of-Sample Performance of the Three-Year Closure Model by Holdout Cohort

				AUC		Top risk decile (gradient boosting)		
Schools open in	Closure window	Closed within 3 years	Base rate (%)	Enrollment only	Gradient boosting	Share of closures (%)	Predicted / observed rate (%)	Expected / observed closures
2017-18	2018-19 to 2020-21	2,082	2.37	0.762	0.837	49	14.4 / 11.7	2,051 / 2,082
2018-19	2019-20 to 2021-22	1,869	2.12	0.756	0.834	49	14.6 / 10.5	2,160 / 1,869
2019-20	2020-21 to 2022-23	1,612	1.83	0.741	0.830	50	14.9 / 9.2	2,226 / 1,612
2020-21	2021-22 to 2023-24	1,608	1.83	0.737	0.824	48	17.2 / 8.7	2,753 / 1,608
2021-22	2022-23 to 2024-25	1,861	2.12	0.759	0.840	52	16.8 / 10.9	2,734 / 1,861

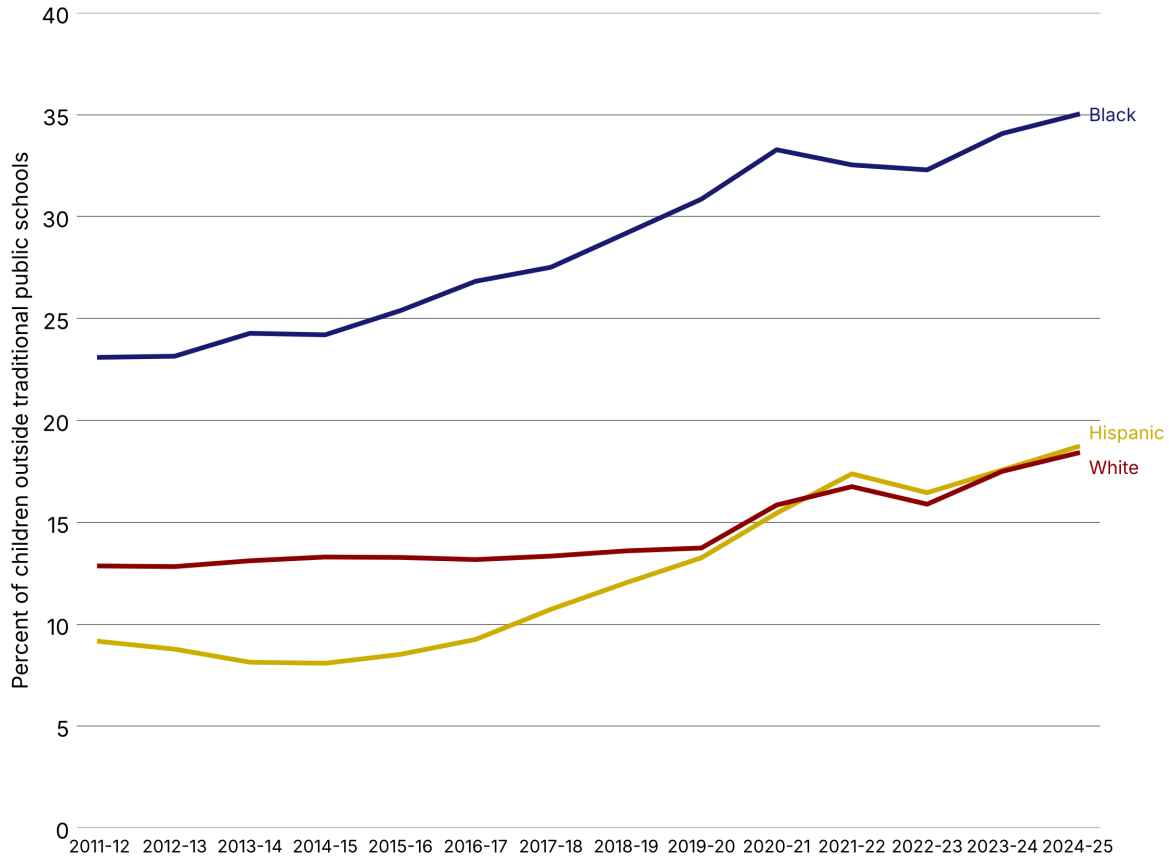
Notes: The outcome equals one if a school open in the cohort year is listed as permanently closed in any of the following three years. For each cohort the models are estimated on cohorts three or more years earlier, whose windows are fully observed by the cohort year. Columns as in Table 2.
Sources: see Table 2.

Table A8: Traditional Public Schools by State: Predicted Closure Probability within One Year (2025–26) and within Three Years (by 2027–28), and Historical Three-Year Closure Rate

State	Schools 2024–25	Mean predicted probability of closure in 2025–26 (%)	Mean predicted probability of closure by 2027–28 (%)	Expected closures by 2027–28	Historical three-year closure rate (%)	Predicted minus historical (pct. points)
Arkansas	946	1.50	4.55	43.0	4.21	+0.34
Mississippi	840	1.30	4.29	36.0	5.57	-1.29
West Virginia	621	1.75	4.28	26.6	3.62	+0.66
Maine	548	1.08	3.74	20.5	4.25	-0.50
Rhode Island	250	1.23	3.71	9.3	3.18	+0.52
Iowa	1,253	1.48	3.39	42.4	3.10	+0.29
Louisiana	1,113	1.11	3.21	35.8	2.76	+0.45
Indiana	1,683	0.91	3.18	53.5	2.61	+0.57
South Carolina	1,096	0.99	3.15	34.5	2.33	+0.82
Pennsylvania	2,655	0.86	3.15	83.6	2.98	+0.17
Texas	7,386	0.86	3.10	229.0	1.80	+1.30
North Dakota	476	1.03	3.09	14.7	3.44	-0.35
Ohio	2,968	1.19	3.01	89.4	2.77	+0.24
Colorado	1,436	0.79	2.81	40.4	2.58	+0.23
Minnesota	1,441	0.84	2.69	38.7	2.66	+0.02
Wyoming	308	1.13	2.68	8.2	3.11	-0.44
Tennessee	1,638	0.72	2.55	41.7	2.48	+0.07
Massachusetts	1,607	0.75	2.54	40.9	2.55	0.00
Kentucky	1,162	0.82	2.50	29.1	2.09	+0.42
South Dakota	633	1.06	2.43	15.4	2.38	+0.05
Michigan	2,539	0.83	2.43	61.7	2.43	0.00
Georgia	2,181	0.72	2.38	51.9	1.98	+0.40
Oklahoma	1,690	0.60	2.27	38.4	2.58	-0.31
Connecticut	945	0.73	2.24	21.2	2.35	-0.12
Kansas	1,266	0.70	2.20	27.9	2.06	+0.15
Nebraska	953	0.81	2.16	20.6	2.63	-0.47
Wisconsin	1,804	0.76	2.15	38.7	2.02	+0.13
Utah	825	0.70	2.07	17.1	1.69	+0.38
Alabama	1,321	0.66	2.06	27.2	2.08	-0.02
North Carolina	2,346	0.51	1.96	46.0	1.64	+0.32
Vermont	288	0.53	1.84	5.3	1.69	+0.15
New Hampshire	444	0.62	1.79	8.0	1.28	+0.51
Florida	2,793	0.37	1.66	46.4	1.05	+0.61
New Mexico	708	0.59	1.54	10.9	1.53	+0.01
Delaware	179	0.36	1.52	2.7	0.91	+0.61
Illinois	3,627	0.51	1.41	51.0	1.71	-0.30
Missouri	2,081	0.55	1.40	29.2	1.21	+0.19
Oregon	1,099	0.44	1.35	14.9	1.21	+0.14
New York	4,252	0.45	1.33	56.6	1.51	-0.18
Maryland	1,258	0.42	1.25	15.8	1.14	+0.12
New Jersey	2,235	0.38	1.24	27.7	1.43	-0.19
Arizona	1,375	0.35	1.16	15.9	0.98	+0.18
Washington	2,014	0.35	1.13	22.8	1.36	-0.23
Alaska	410	0.69	1.12	4.6	0.92	+0.20
Virginia	1,802	0.44	1.07	19.3	1.01	+0.06
California	7,619	0.31	1.04	79.0	0.90	+0.13
Idaho	614	0.43	0.98	6.0	0.73	+0.24
Montana	821	0.26	0.66	5.4	0.51	+0.15
Nevada	572	0.09	0.28	1.6	0.08	+0.20
District of Columbia	111	0.11	0.24	0.3	0.10	+0.13
Hawaii	256	0.06	0.18	0.5	0.00	+0.18

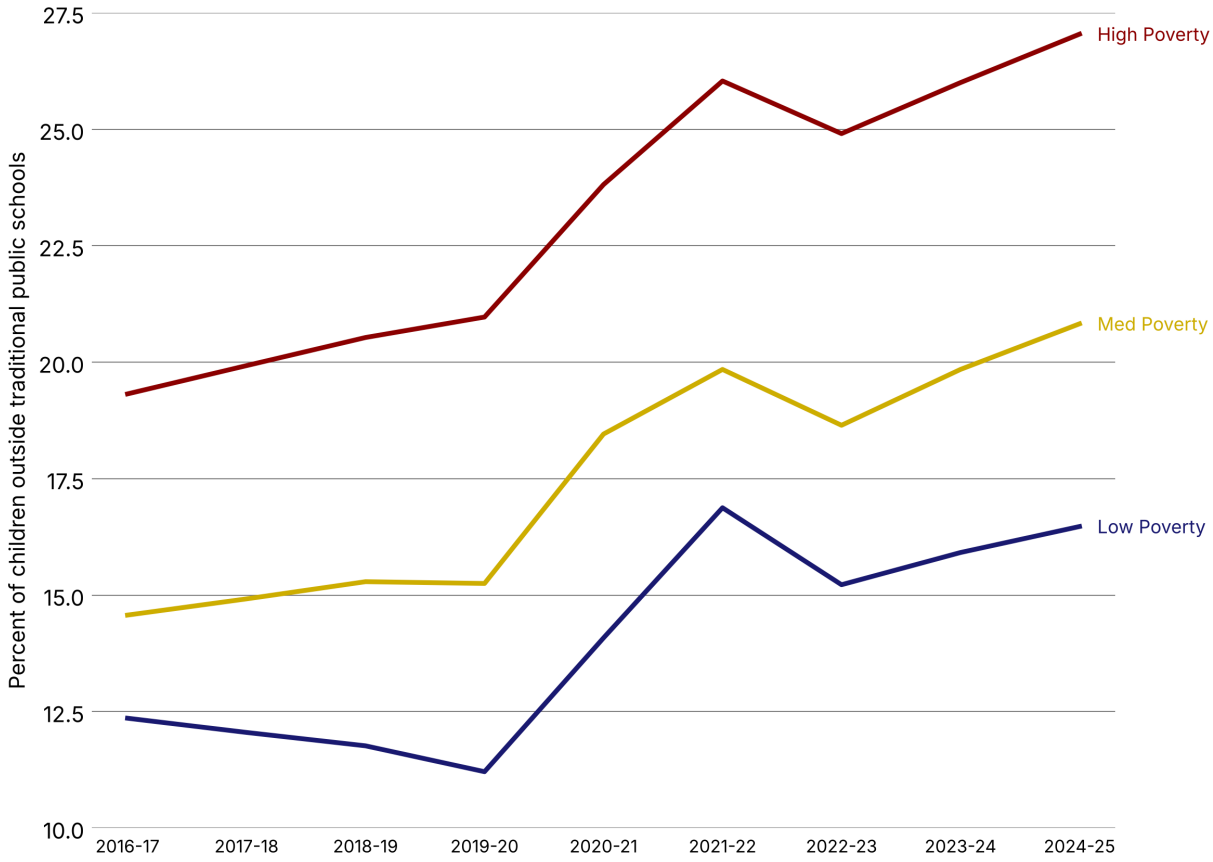
Notes: Traditional public schools open in 2024–25, sorted by the three-year probability. The one-year column repeats Table A3. The Spearman rank correlation between the two state series is 0.94. The historical three-year closure rate is the share of the state's traditional public schools open in a cohort year that closed within three years, pooled over cohorts 2013–14 to 2021–22. The last column is the three-year probability minus the historical rate. Figure 5 maps the three-year probability (Panel A) and this difference (Panel B).

Figure A1: Share of Children Outside Traditional Public Schools in Districts Serving Predominantly Black, Hispanic, or White Students, 2011–12 to 2024–25



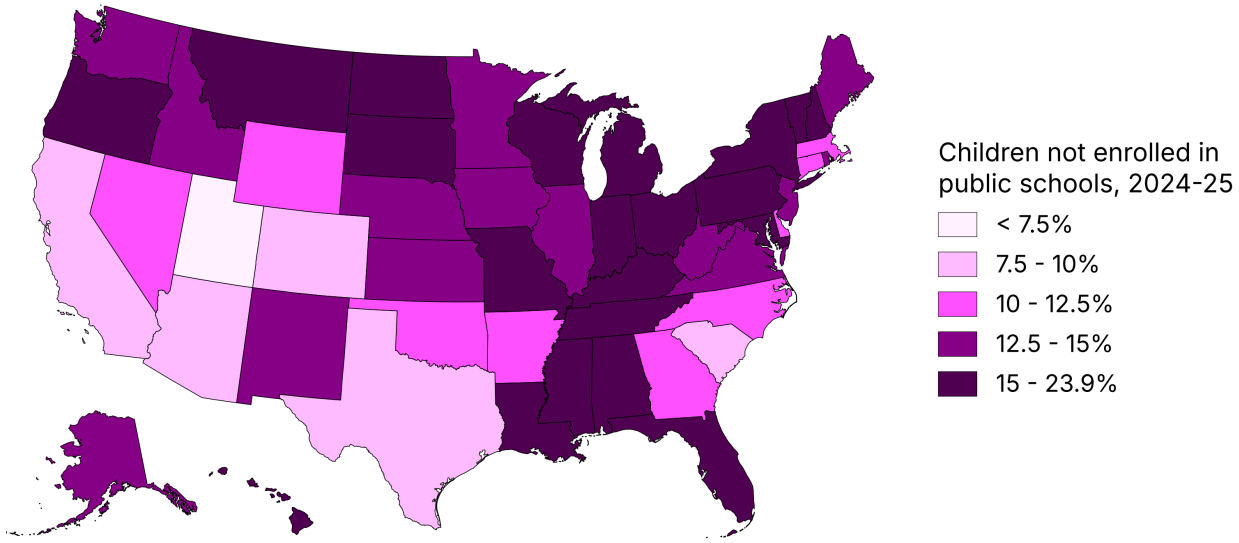
Notes: Districts in which one group accounted for at least 90 percent of 2016–17 public enrollment. Percent of the district child population not enrolled in a traditional public school. *Sources:* Common Core of Data (NCES). SAIPE (U.S. Census Bureau). Author's calculations.

Figure A2: Share of Children Outside Traditional Public Schools, by District Poverty Level, 2016–17 to 2024–25



Notes: Districts are split into terciles of the 2016–19 average child poverty rate (cutoffs 11.47 and 19.22 percent).
Sources: Common Core of Data (NCES). SAIPE (U.S. Census Bureau). Author's calculations.

Figure A3: Share of School-Age Children Not Enrolled in Public Schools, by State, 2024–25



Notes: State child population (ages 5–17, SAIPE 2024) less public K–12 enrollment, as a percent of the child population. The measure combines private school enrollment and children not found in any record. State-level private school counts are available only through 2023–24. The 2023–24 split is in Council et al. (2025). Negative values are set to zero. *Sources:* Common Core of Data (NCES). SAIPE (U.S. Census Bureau). Author's calculations.

Figure A4: Traditional Public Schools by State: Average Closure Rate 2014–15 to 2024–25, Observed Closure Rate 2024–25, and Predicted Closure Probability 2025–26

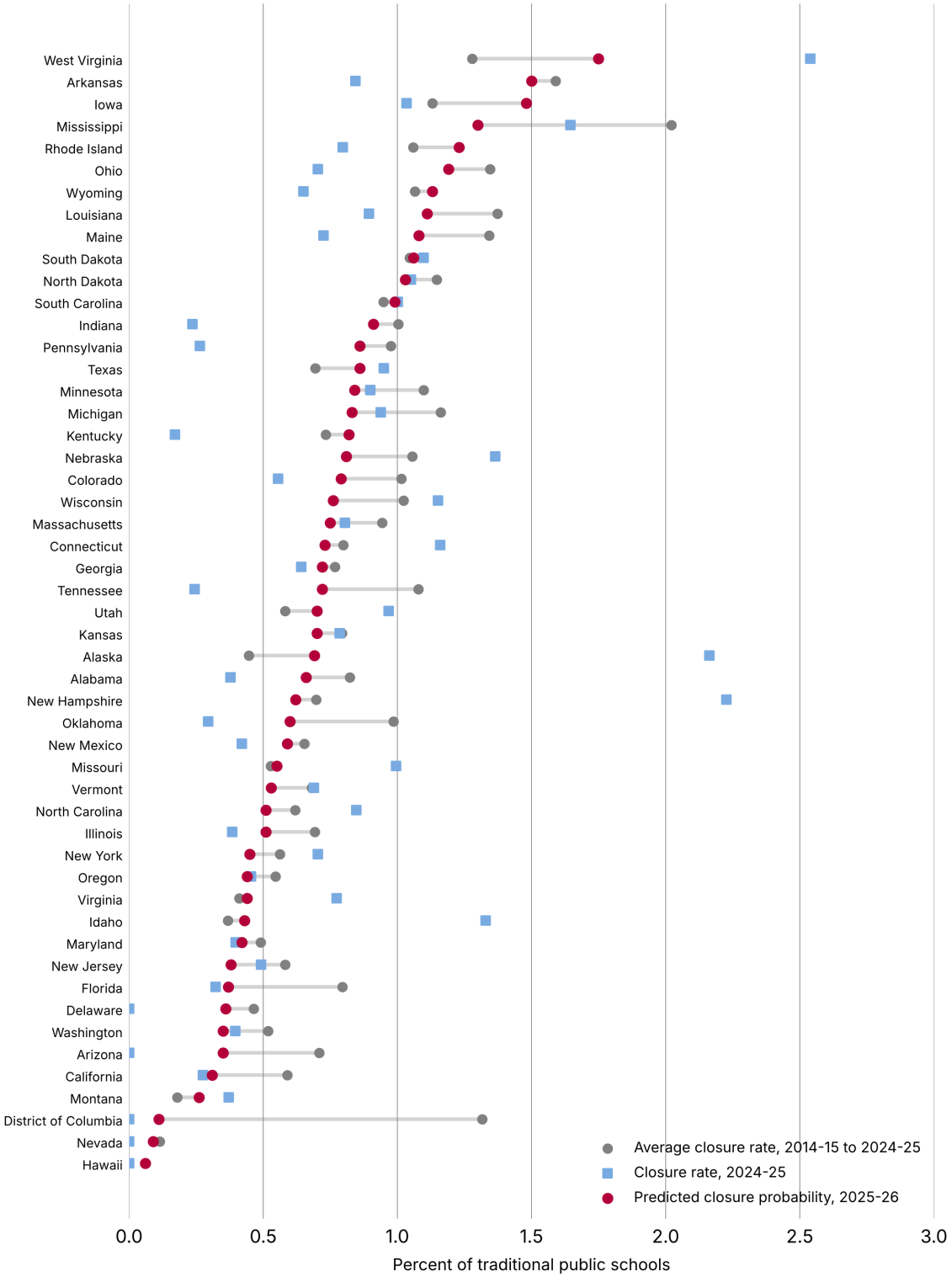
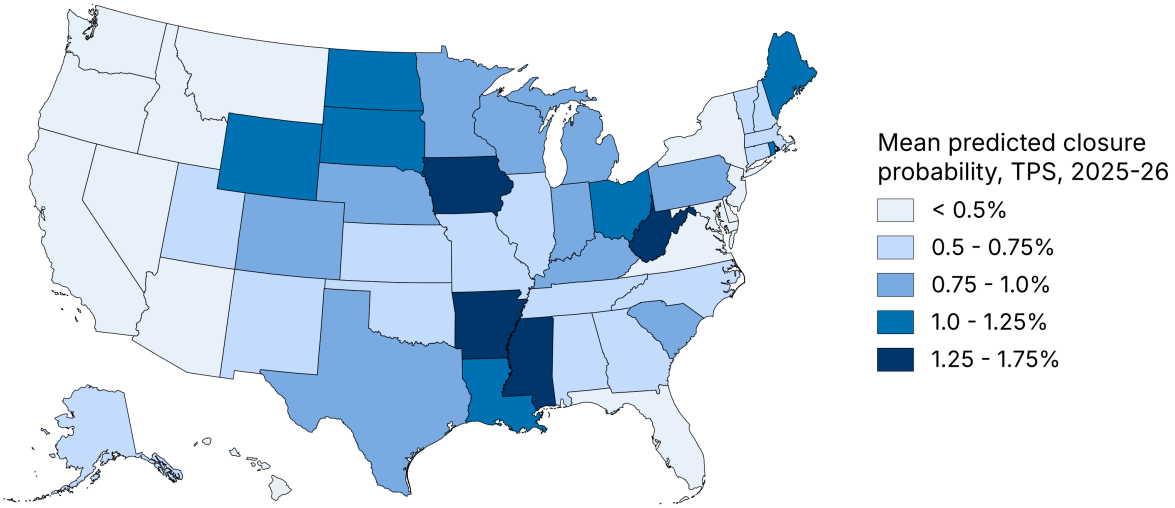
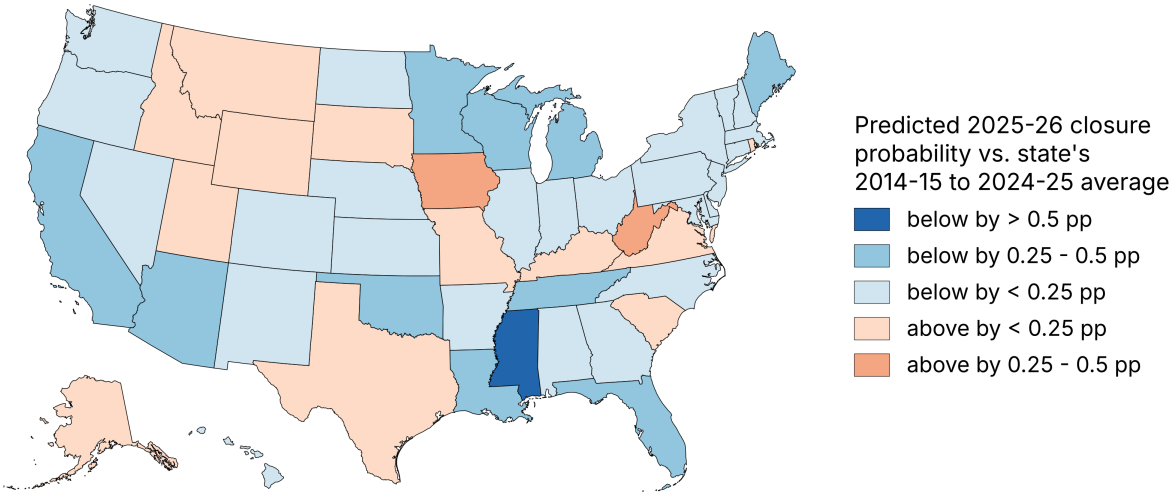


Figure A5: Closure Pressure on Traditional Public Schools by State, 2025–26: One-Year Index and Change from Each State's Own History

Panel A: Mean Predicted Closure Probability in 2025–26 (One-Year Closure-Pressure Index)



Panel B: Predicted 2025–26 Probability Minus the State's Own Average Closure Rate, 2014–15 to 2024–25



Notes: Traditional public schools only. Panel A averages the one-year gradient-boosting model's predicted closure probabilities over schools open in 2024–25. Panel B subtracts each state's own average annual closure rate over 2014–15 to 2024–25. Figure A4 shows the underlying values with the observed 2024–25 rate. *Source:* Common Core of Data (NCES). Author's calculations.