

Annotated Bibliography: Exploring the impact of school bonds

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Introduction

The list of resources that follows is a collection of 15 studies that provide information on the impacts of school capital bond passage, capital investment, and school construction and renovation on student, teacher, and community outcomes. The literature search was not a systematic review. We created a list of relevant search terms to search broadly across academic databases. We applied these search terms to a light Google search to pick up any grey literature. The research studies included here are considered to be methodologically rigorous but may still have some limitations. Studies that we classified as rigorous used quasi-experimental approaches, including interrupted time series, regression discontinuity design, instrumental variables, and difference-in-differences. We did not find any randomized control trials.

The references are listed in alphabetical order, not necessarily in order of relevance. The research conducted is not comprehensive; other relevant references and resources may exist. For each reference, we provide an abstract, excerpt, or summary written by the study's author or publisher as well as information about the study's methodology.

Research references

Cellini, S. R., Ferreira, F., & Rothstein, J. (2010). The value of school facility investments: Evidence from a dynamic regression discontinuity design. *Quarterly Journal of Economics*, 125(1), 215–261. <https://doi.org/10.1162/qjec.2010.125.1.215>

Summary: In this study, the researchers sought to gain more understanding of the economic return of public infrastructure spending by estimating the impact of school facility investments on housing markets, student achievement, and district composition in California school districts. The results revealed that passing a referendum brings immediate, sizable increases in home prices. The researchers estimated that homebuyers are willing to pay \$1.50 or more for each \$1.00 of capital spending. Positive effects on third-grade reading and mathematics scores appear by the sixth year after bond passage. However, the research found that the increase in test scores only explains a small

share of the increase in housing prices, meaning the researchers could not conclude that the effect of bond passage on home prices was driven by student achievement.

Conlin, M., & Thompson, P. N. (2017). Impacts of new school facility construction: An analysis of a state-financed capital subsidy program in Ohio. *Economics of Education Review*, 59, 13–28.

<https://doi.org/10.1016/j.econedurev.2017.05.002>

From the abstract: “This paper analyzes Ohio’s capital subsidy program which distributed over \$10B for school construction in 231 school districts between 1997 and 2011. Using an instrumental variables estimation, we find the percentage of students meeting test score proficiency thresholds decrease in math and reading in the first couple years after the capital expenditures and then increase in subsequent years. These results are consistent with short-term disruptions in student learning followed by long-term benefits from the capital expenditures. We also consider mechanisms by which capital expenditures affect achievement and find some evidence that changes in capital expenditures are correlated with changes in operating expenditures, suggesting that some of these effects may be attributable to operating expenditures. We find similar effects of these capital investments on the housing market. While in the short-term these construction projects decrease home prices, the housing market does benefit in the long-term from improvements to the capital stock.”

Goncalves, F. (2015). The effects of school construction on student and district outcomes: Evidence from a state-funded program in Ohio. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2686828>

From the abstract: “I study an ongoing state-subsidized program of rebuilding and renovating Ohio’s K-12 public schools and investigate the effect of improved facility quality on student and school district outcomes. The completion of a project increases public school enrollment and district property values. Test scores do not measurably improve upon completion and suffer significant reductions during construction. The implied willingness to pay for a project is lower than total costs but greater than the cost borne by district residents. While the program led to a narrowing in expenditures across district wealth, I find little evidence that it reduced disparities in student outcomes.”

Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: An update. *Educational Evaluation and Policy Analysis*, 19(2), 141–164.

<https://doi.org/10.2307/1164207>

From the abstract: “The relationship between school resources and student achievement has been controversial, in large part because it calls into question a variety of traditional policy approaches. This article reviews the available educational production literature, updating previous summaries. The close to 400 studies of student achievement demonstrate that there is not a strong or consistent relationship between student performance and school resources, at least after variations in family inputs are taken into account. These results are also reconciled with meta-analytic approaches and with other investigations on how school resources affect labor market outcomes. Simple resource policies hold little hope for improving student outcomes.”

Hashim, A. K., Strunk, K. O., & Marsh, J. A. (2018). The new school advantage? Examining the effects of strategic new school openings on student achievement. *Economics of Education Review*, 62, 254–266. <https://doi.org/10.1016/j.econedurev.2017.12.002>

From the abstract: “This paper examines the effects of strategic new school openings (SNSOs) on student achievement at brand new (“relief”) campuses built to alleviate overcrowding at neighboring “feeder” campuses in the Los Angeles Unified School District (LAUSD). We focus on a subset of schools involved in LAUSD’s Public School Choice Initiative (PSCI), which aimed to increase high quality school options by awarding management of newly-constructed relief schools to diverse operators based on innovative and evidence-based school plans and autonomies from district policies. ... We find that relief school openings had negative start-up effects on student achievement, but led to improved achievement in subsequent years of PSCI.”

Hong, K., & Zimmer, R. (2016). Does investing in school capital infrastructure improve student achievement? *Economics of Education Review*, 53, 143–158. <https://doi.org/10.1016/j.econedurev.2016.05.007>

From the abstract: “Within the research community, there is a vigorous debate over whether additional educational expenditures will lead to improved performance of schools. Some of the debate is an outgrowth of the lack of causal knowledge of the impacts of expenditures on student outcomes. To help fill this void, we examine the causal impact of capital expenditures on school district proficiency rates in Michigan. ... Our results provide some evidence that capital expenditures can have positive effects on student proficiency levels.”

Hong, K. (2017). School bond referendum, capital expenditure, and student achievement. *The B.E. Journal of Economic Analysis & Policy*, 17(4). <https://doi.org/10.1515/bejeap-2016-0341>

Summary: In this paper, Hong estimates the average effect of capital expenditure on student achievement by comparing school districts in Michigan that have similar preferences for educational investment. The School Bond Qualification and Loan Program in Michigan was created in 1955 to help districts build facilities as a result of a growth in the student population and the program continues to assist districts fund school construction. The researcher analyzed Michigan bond election data from 1996 to 2009 that was matched with reading proficiency rates at the district level of fourth and seventh graders. The study found that capital expenditure subsidized by a passed bond does not have a significant effect on student achievement. Based on the analysis, the paper concludes that infrastructure investment is a less effective approach to improving student achievement compared to other school efforts, such as class size reduction programs.

Jackson, C. K., & Mackevicius, C. (2021). *The distribution of school spending impacts* (Working Paper 28517). National Bureau of Economic Research. <https://doi.org/10.3386/w28517>

Summary: In this paper from the National Bureau of Economic Research, the researchers analyze 31 studies that look at the causal effects of public K–12 school spending on student outcomes in the United States. Across these studies, 28 found positive impacts of policies that increased school spending on student outcomes, and the authors concluded that the credible evidence they looked at shows that spending does matter for student educational attainment and test scores. However, the researchers also looked specifically at capital spending increases and found that the outcomes of large, one-time spending increases take 5 to 7 years to appear in measures of student outcomes. The effects of this type of spending were half as large as the effects of other forms of spending, such as increases that are sustained over multiple years. The researchers concluded that policies that increase per-pupil spending by \$1,000 for at least 4 years will see positive impacts on test scores over 91% of the time.

Jones, J. T., & W. Zimmer, R. (2001). Examining the impact of capital on academic achievement. *Economics of Education Review*, 20(6), 577–588. [https://doi.org/10.1016/S0272-7757\(00\)00043-1](https://doi.org/10.1016/S0272-7757(00)00043-1)

From the abstract: “While a growing body of literature on education production looks at the impact school inputs have on academic achievement, virtually no research is examining the impact capital is having on academic achievement. In this study, we take an initial step towards that end. By using school districts’ level of bond indebtedness as a proxy for capital, we find evidence that capital stock does affect academic achievement. In light of these findings along with the general lack of research on capital inputs, we conclude that capital expenditures should be given greater attention in future research.”

Lafortune, J., & Schönholzer, D. (2022). The impact of school facility investments on students and homeowners: Evidence from Los Angeles. *American Economic Journal: Applied Economics*, 14(3), 254–289. <https://doi.org/10.1257/app.20200467>

From the abstract: “We study school facility investments using administrative records from Los Angeles. Exploiting quasi-random variation in the timing of new facility openings and using a residential assignment instrument, we find positive impacts on test scores, attendance, and house prices. Effects are not driven by changes in class size, peers, teachers, or principals, but some evidence points toward increased facility quality. We evaluate program efficiency using implied future earnings and housing capitalization. For each dollar spent, the program generated \$1.62 in household value, with about 24 percent coming directly through test score gains and 76 percent from capitalization of non-test-score amenities.”

Martorell, P., Stange, K., & McFarlin, I. (2016). Investing in schools: Capital spending, facility conditions, and student achievement. *Journal of Public Economics*, 140, 13–29.

<https://doi.org/10.1016/j.jpubeco.2016.05.002>

From the abstract: “Public investments in repairs, modernization, and construction of schools cost billions. However, little is known about the nature of school facility investments, whether it actually changes the physical condition of public schools, and the subsequent causal impacts on student achievement. We study the achievement effects of nearly 1,400 capital campaigns initiated and financed by local school districts, comparing districts where school capital bonds were either narrowly approved or defeated by district voters. Overall, we find little evidence that school capital campaigns improve student achievement. Our event-study analyses focusing on students that attend targeted schools and therefore exposed to major campus renovations also generate very precise zero estimates of achievement effects. Thus, locally financed school capital campaigns – the predominant method through which facility investments are made may represent a limited tool for realizing substantial gains in student achievement or closing achievement gaps.”

Neilson, C. A., & Zimmerman, S. D. (2014). The effect of school construction on test scores, school enrollment, and home prices. *Journal of Public Economics*, 120, 18–31.

<https://doi.org/10.1016/j.jpubeco.2014.08.002>

From the abstract: “This paper provides new evidence on the effect of elementary and middle school construction projects on home prices, academic achievement, and school enrollment. Combining the staggered implementation of a comprehensive school construction project in a poor urban district with panel data on student test scores and neighborhoods of residence, we find that, by six years after building occupancy, school construction increases reading scores by 0.15 standard deviations relative to the year before building occupancy. We do not observe similar effects for math scores. School construction raised home prices in affected neighborhoods by roughly 10%, and led to increased public school enrollment.”

Rauscher, E. (2020). Delayed benefits: Effects of California school district bond elections on achievement by socioeconomic status. *Sociology of Education*, 93(2), 110–131.

<https://www.jstor.org/stable/48588944>

Summary: The researchers respond to contradictory evidence on the relationship between education funding and student achievement by looking at the impact of one type of revenue source: bond funds for capital investment. Data from California school districts showed that there was increased achievement among students from families with low socio-economic status (SES) in a district that passed a bond, but there was no evidence of achievement gains among students from high-SES families. The benefits seen in the population of students from low-SES families arose 6 years after the bond election. In addition, there are larger effects that arise in low-income districts and in small districts because a larger proportion of students benefit from capital investments.

Welsh, W., Coghlan, E., Fuller, B., & Dauter, L. (2012). *New schools, overcrowding relief, and achievement gains in Los Angeles – Strong returns from a \$19.5 billion investment*. Policy brief. PACE. [ED534560.pdf](#)

Summary: This policy brief looked at the impacts of the Los Angeles Unified School District's \$19 billion investment in 130 new facilities, which were built over the preceding decade. Researchers from UC Berkeley estimated the achievement effects of the project and found that significant gains are identifiable for elementary school students who switched from an old school facility to a newly constructed one. Students who switched to the new schools showed improvements that were equivalent to 35 additional days of instruction each year compared to the average student in the district. The researchers also found that the achievement gains across students were not significantly different for students moving to less costly new schools compared to more expensive schools. The most significant achievement gains were seen among students who moved from the most severely overcrowded schools in the district.

Schlaffer, J., & Burge, G. (2023). The asymmetric effects of school facilities on academic achievement: Evidence from Texas bond votes. *The Social Science Journal*, 60(2), 235–253. <https://www.tandfonline.com/doi/10.1080/03623319.2020.1735853>

Summary: In this paper, the researchers examine variation in levels of capital funding in Texas school districts to offer new evidence on the asymmetric effects of investments in educational facilities on academic achievement. The study compared test performances of 4 million third- to eighth-grade students before and after they were exposed to narrowly passed or failed school bonds. The results revealed that additional school facilities increase average achievement by a small margin. Even students who did not attend a district's newly built school showed increased achievement, which the researchers note is a valuable point for local policy makers to consider when talking to residents about the importance of infrastructure investment. However, the asymmetric effects of school bond passage appear when comparing pre- and post-exposure test performance. Students whose test scores originally were low saw significant gains in achievement after school bond passage, but students who were high scorers experienced a negative impact.

Environmental and facility quality impact studies

The six resources that follow include descriptive (non-causal) studies that examine the impact that school facility quality has on student outcomes, including test scores and proficiency rates, and teacher retention.

Buckley, J., Schneider, M., & Shang, Y. (2005). Fix it and they might stay: School facility quality and teacher retention in Washington, D.C. *Teachers College Record*, 107(5), 1107–1123.

<https://doi.org/10.1111/j.1467-9620.2005.00506.x>

From the abstract: “The attrition of both new and experienced teachers is a challenge for schools and school administrators throughout the United States, particularly in large urban districts. Because of the importance of this issue, there is a large empirical literature that investigates why teachers quit and how they might be induced to stay. Here we build upon this literature by suggesting another important factor in the teacher decision to stay or leave: the quality of school facilities. We investigate the importance of facility quality using data from a survey of K–12 public school teachers in Washington, D.C. We find in our sample that facility quality is an important predictor of the decision of teachers to leave their current position, even after controlling for other contributing factors.”

Bowers, A. J., & Urick, A. (2011). Does high school facility quality affect student achievement? A two-level hierarchical linear model. *Journal of Education Finance*, 37(1), 72–94.

<https://www.jstor.org/stable/23018141>

Summary: The purpose of the study is to identify the effects of facility quality in high schools on student achievement. The researchers used a large, nationally representative U.S. database of student achievement and school facility quality—specifically looking at the effect of facility disrepair on student growth in math test scores in the final 2 years of high school. The study found no evidence that facility disrepair has a direct effect on student mathematics achievement. The researchers propose that there may be a mediating factor, such as educators’ perceptions of facility quality. They also acknowledge that their findings are limited to mathematics achievement and do not indicate whether there is an effect on reading achievement or overall achievement.

Branham, D. (2004). The wise man builds his house upon the rock: The effects of inadequate school building infrastructure on student attendance. *Social Science Quarterly (Wiley-Blackwell)*, 85(5), 1112–1128. <https://doi.org/10.1111/j.0038-4941.2004.00266.x>

Summary: This study hypothesizes that the conditions of school infrastructure have notable impacts on student performance in school. Using data from 226 schools in the Houston Independent School District, the researchers found that schools that are in structural ruin, that rely on temporary buildings instead of permanent structures, and that have inadequate custodial services create an environment in which students are less likely to attend school and more likely to drop out compared to students in schools without these issues.

Brooks, E., & Weiler, S. C. (2018). The relationship between the condition of Colorado elementary school facilities and student achievement. *Journal of Education Finance*, 43(4), 397–416.

<https://www.jstor.org/stable/45093703>

Summary: This correlational study aimed to measure the relationship between the overall school facility condition for traditional Colorado elementary schools, measured by Colorado's Facilities Conditions Index, and student achievement as measured by the Colorado Student Assessment Program. However, the researchers found little to no relationship between student achievement and school facility conditions. In their analyses, the researchers found socio-economic status to be the greatest predictor of student achievement.

Filardo, M., Vincent, J. M., & Sullivan, K. (2019). How crumbling school facilities perpetuate inequality. *The Phi Delta Kappan*, 100(8), 27–31. <https://www.jstor.org/stable/26677390>

From the abstract: "The average public school building was built around 1968 — more than 50 years ago — and the National Center for Education Statistics reports that half of all public schools in the United States need at least one major facility repair. Mary Filardo, Jeffrey Vincent, and Kevin Sullivan explain how poorly maintained school buildings have a negative effect on both student and teacher performance and health. Because local districts are responsible for funding their own building maintenance and upgrades, poor communities lack the resources to keep facilities in adequate shape, much less to modernize them, and needed repairs may be made using the same operating funds used to pay teachers and purchase instructional materials. The authors express hope that interest in infrastructure improvements at the federal level will enable schools to receive the funding they need."

Gunter, T., & Shao, J. (2016). Synthesizing the Effect of Building Condition Quality on Academic Performance. *Education Finance and Policy*, 11(1), 97–123. https://doi.org/10.1162/EDFP_a_00181

From the abstract: "Since the late 1970s, researchers have examined the relationship between school building condition and student performance. Though many literature reviews have claimed that a relationship exists, no meta-analysis has quantitatively examined this literature. The purpose of this review was to synthesize the existing literature on the relationship between building condition and student performance. Means for the semi-partial ($= 0.10$) and bivariate ($= 0.12$) correlations were relatively small but significantly different, supporting the claim that school building condition is related to student performance. Furthermore, results revealed that the magnitude of the correlation varied as a function of a number of moderator variables. For instance, the building condition feature measured, instrument type, subject area measured, and grade level affect the association between school building condition and student performance. Our findings offer useful information for educational leaders, policy makers, and researchers."