

# The Effect of Passing School Bond Measures on Student Achievement: Morale and Capital Spending

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There is a large literature on the effects of capital spending and facility quality on student achievement. However, the literature has not reached a clear consensus with some papers finding large positive effects and others finding none [5, 7, 6, 2]. Despite the lack of consensus, we continue to invest heavily in public school facilities. California, the state that is the focus of this paper, spent over \$6 billion in capital spending in the 2013-2014 school year. The United States as a whole spending \$939 per student on capital during the 2013-2014 school year [12].

There is also a large literature on school climate and morale [1]. Including many articles on school climate contributing to academic performance [14]. As far as I am aware, no studies have looked at school morale effects from school bond measures.

In this paper I use a dynamic regression discontinuity design to measure the effect of passing school bonds on student test scores. School district bonds in California are used to finance capital projects with construction being the main increase in spending. In addition to testing the effect of the added capital spending, I look at test scores the year of the election, before most spending would begin, to look for morale effects on test scores caused by the passage of school bond measures.

Several mechanisms for how capital spending could effect student achievement have been put forth by the literature including improved lighting, indoor air quality, climate control, building quality, noise levels, as well as science laboratories and libraries [11, 15]. It may also be the case that increases in capital spending help students in other ways outside of what would be measured in test scores, such as improving safety or athletics.

I am aware of three papers that have previously used school bonds as a source of variation in capital spending. The first paper by Cellini, Ferreira, and Rothstein also looked in California [3]. They found sizable and immediate increases in house prices after the passage of a school bond, but found only a limited effect on test scores. They looked at only third and fourth grade test scores, with third grade having the longest series of scores. For third grade they used a combination of tests from 1998 to 2007 including the California Achievement Tests from 2003 to 2007. They found very small improvements in third grade test scores six years after the bond passage. The second paper by Hong and Zimmer found initial negative effects for the first two years followed by positive effects on fourth and seventh grade student proficiency levels four to eight years after a bond is passed [8]. It may be the case that capital spending is targeted more at raising proficiency rates as recent paper by Michael Conlin and Paul Thompson found a similar pattern after a school construction subsidy program in Ohio [4]. Finally, a study by Martorell, Stange, and McFarlin used a similar design to study the effect of school bonds in Texas [10]. This study found no effect on test scores. None of these papers looked at test scores the year of the election.

In this paper I use a dataset that covers more years of test scores than that used in Cellini, Ferreira, and Rothstein and that has more grades. Also, by using a longer dataset I avoid needing to merge results from different tests.

I find a large increase in per student capital spending during the three years after a bond measure passes, which is almost completely explained by increased spending on construction. I find no evidence that would indicate that the increased capital spending for construction benefited student test scores in the long-term. I do, however, find an immediate increase in test scores during the year that the bond passed. Because this effect happens before most of the increase in spending and because it fades so quickly, it seems to indicate that there is some morale response to bond measures outside the increase in spending. This effect does not appear to be caused by compositional changes to the student body. The effect seems to take some time to kick in as I do not see a significant effect for elections that took place just before the tests and see a larger effect for elections that took place in the summer and fall, when there would have been almost a whole school year between the election and the tests.

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