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How Much Does Public School Facility Funding Depend on Property Wealth?

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Running Title: **School Facility Funding and Property Wealth**

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Abstract

We examine how funding for public school facilities varies with school district property wealth and household income. Using data on school facility (i.e., capital) funding in California from fiscal years 1986-87 to 2015-16, we find that funding for school construction and modernization varies widely across districts. Disparities in funding are driven primarily by inter-district differences in property wealth with the highest property wealth districts raising significantly more funding for school facilities. Assessed value per-pupil in California is also negatively correlated with the share of disadvantaged students and students of color. As a result, school facility funding tends to be substantially lower in districts with the highest concentrations of disadvantaged students and students of color.

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<A> Introduction

Court-ordered school finance reforms have fundamentally altered state and local public finance in the United States. The argument at the center of many school finance reform cases is that disparities in local property wealth across school districts should not result in disparities in revenue per-pupil. This argument goes back to the first successful court-ordered school finance reform case: *Serrano v. Priest* (1971). In this case, the California (CA) Supreme Court ruled that education was a fundamental right and school district wealth was a suspect classification because school districts with lower assessed property value per-pupil had to levy higher tax rates to have the same spending per-pupil. As a result, the court found that differences in revenue per-pupil due to differences in assessed value per-pupil violated the equal protection clause of the state constitution.[1] *Serrano,* however, focused exclusively on disparities in *current operational* school funding. As with most other school finance reform cases, the *Serrano* decision did not address disparities in school *facility* (or *capital*) funding.[2]

Most states fund school facilities primarily with revenue raised from local general obligation bonds that are repaid with property tax increases that remain in effect until the bonds are repaid. In 2018 alone, school districts across the United States issued more than $62 billion in long-term debt to fund new school construction and modernization projects (U.S. Census Annual Survey of School System Finances). Reliance on the local property tax to fund school facilities naturally raises the question of how school facility funding varies with household income and school district property wealth.

[1] For a detailed discussion of school finance reform in California and the causes and consequences of *Serrano v. Priest* see Sonstelie, Brunner and Ardon (2000).
[2] In a small number of states including Arizona, New Jersey and Ohio, courts have ruled that the reliance on the local property tax to fund school facilities was unconstitutional because it led to wide disparities in the condition of school facilities across districts. See Thompson (1989) and Mason and Arsen (2010) for a discussion of the role of courts in addressing inequities in school facility funding.

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While there exists an extensive literature on the adequacy and equity of current school funding, to date, very little attention has been paid to how district income and property wealth affect the distribution of school facility funding.[3] The purpose of this paper is to present some of the first systematic evidence on how district property wealth and income affect the distribution of school facility funding across school districts.[4] Our analysis is based on detailed administrative data on school facility funding from 1986-87 through 2015-16 for the state of California.

California provides an interesting and important case study for several reasons. First, similar to most other states, California relies primarily on local general obligation bonds and state aid to fund school facility investments. Thus, our findings may provide insights into how disparities in school district income and property wealth affect the distribution of facility funding in other states. Second, as shown in Figure 1, there is a strong positive correlation, with a correlation (corr.) of 0.56, between school district assessed value per-pupil (horizontal axis) and local general obligation bond revenue per-pupil in California (vertical axis).[5] Moreover, not only is property wealth positively correlated with G.O. bond revenue, but, as shown in Figure 2, local tax effort to fund these capital outlays is negatively correlated with property wealth (corr. -0.36). Thus, districts with higher property wealth in California tend to raise significantly more revenue for school facility investments and do so by levying lower tax rates than districts with lower property wealth.[6] These correlations suggest that disparities in school district property wealth, which led to large disparities in current spending prior to 1971 and precipitated the overhaul of

[3] See for example, Murray, Evans and Schwab (1998), Hoxby (1998, 2001) and Corcoran and Evans (2015).
[4] There exists a small literature that examines the distribution of school facility funding within and across states but none focus on the role income and property wealth play in the distribution of facility funding. See Duncombe and Wang (2009), Glenn et al. (2009) and Biasi, Lafortune and Schönholzer (2021).
[5] The G.O. bond data represent the sum of all local G.O. bonds issued by a school district for the fiscal years 2007 to 2016. The assessed value data is from 2017 and represents the total assessed value of property within a school district.
[6] Data on local school district property tax rates to finance G.O. bond issues are from 2017 and were hand collected by contacting the assessor's office in each county in California.

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California's system of current school finance, may continue to persist in California's system of school facility funding.

We find that funding for school construction and modernization varies widely across districts. For example, in unified districts, the difference between the 90th and the 10th percentiles of facility revenue per pupil ($20,365 and $3,915, respectively) over the ten-year period from 2007-2016 is over $16,000 per pupil. Thus, a district in the 90th percentile of total facility revenue per-pupil receives, on average, 420 percent more funding than a district in the 10th percentile. Part of this variation is due to differences in enrollment growth: districts with higher enrollment growth rates tend to have higher facility revenue per-pupil. However, a much larger share of the variation is related to differences in property wealth: districts with higher assessed value per-pupil raise substantially more revenue through local general obligation bond issues and, consequently, tend to have substantially higher total revenue per-pupil. Assessed value per-pupil in California is also negatively correlated with the share of disadvantaged students and students of color. As a result, school facility funding tends to be substantially lower in districts with the highest concentrations of disadvantaged students and students of color.

Overall, our analysis reveals large school facility funding differences across districts related to property wealth and a state aid program that does little to dampen inequality except at the very bottom of the wealth distribution. As a result, California's system of school facility finance is relatively regressive.

<A> Conceptual Framework

What explains the level and distribution of school facility funding across school districts? Variation in school facility investments is driven primarily by two factors: 1) variation in the

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preferred level of school facility quality, as determined by preferences and local budget constraints, and 2) variation in the difference between this preferred level of capital and the current stock of capital. Variation in the preferred level of school facility quality is driven primarily by district property wealth, district household income, and the preferences of residents for school facility investments and education quality more generally (Biasi, Lafortune, and Schönholzer 2021; Duncombe and Wang 2009; Glenn et. al. 2009). Property wealth and the composition of the property tax base affects the marginal price of school facility spending for local school districts. Specifically, the marginal price (tax price) of school spending, represents the additional property tax burden borne by a homeowner when spending per-pupil increases by one dollar. It is equal to the assessed value of a voter's home divided by the district's total assessed value per-pupil. Note that the marginal price of school spending depends critically on the composition of a districts' property tax base. In particular, the larger the share of nonresidential property in a district, the less residents must pay to raise each dollar in revenue.[7] Consequently, nonresidential property effectively acts as a "subsidy" and lowers the tax price associated with school spending faced by voters.

While household income and property wealth are two distinct concepts, they are often conflated, with high income districts and districts with high property wealth often simply referred to interchangeably as "high wealth" or "wealthy" districts. However, while a district's household income and property wealth tend to be positively correlated, primarily because there is a positive correlation between the assessed value of residential property and household income, the composition of the property tax base can cause deviations between these two measures of

[7] Also note that regardless of the share of nonresidential property, districts with a larger property tax base (either due a significant amount of nonresidential property or simply due to high assessed values of residential properties) would need to levy a lower property tax rate to fund the same level of school facility investments per pupil.

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"wealth." For example, residents of an urban district whose property tax base is comprised largely of commercial and industrial properties can be low-income but live in a district with a high assessed value per pupil (i.e., a low-income, high-wealth district).

In terms of voter preferences for school facility investment, a number of studies have found that support for school infrastructure bonds (G.O. bonds) is positively related to the share of the population with a college degree (e.g., Zimmer et al. 2011; Bowers and Chen 2015). Other studies have found a negative relationship between support for school infrastructure bonds and the share of individuals 65 years and older in a community, the share of voters that identify as conservative or are registered republicans, and the share of homeowners (see Balsdon, Brunner and Rueben 2003; Brunner, Robbins and Simonsen 2018).[8]

Variation in the difference between the preferred level of school facility quality and the current level is driven primarily by previous school facility investments, as well as current and future expectations of enrollment growth (Balsdon, Brunner and Rueben 2003). Intuitively, districts with an older capital stock or those facing rising enrollments will likely have the largest gaps between the current level of school facility quality and the preferred level. Importantly, variation in the timing of school facility investments and variation in enrollment growth across districts naturally lead to disparities in school facility spending that may be unrelated to district income or property wealth.

Finally, as noted by Biasi, Lafortune, and Schönholzer (2021), the level and distribution of school facility investments is also affected by state-specific fiscal rules including whether a state: 1) requires voter approval for school districts to issue bonds; 2) requires a supermajority to

[8] The literature on the demand for school facility investments and preferences for facility investments focuses on the determinants of support for local school district bond referenda. See Bowers and Chen (2015) and Brunner, Robbins and Simonsen (2018) for a review of this literature.

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approve bonds; 3) has a local tax and expenditure limitation; 4) imposes debt capacity limits on local school districts; 5) provides matching aid, lump sum aid or no aid for school infrastructure investments; and 6) supports local school facility investments with state-level G.O. bonds or through some other mechanism such as the general fund. California is generally comparable to numerous other states along these dimensions. Specifically, California is one of 47 states that requires voter approval to issue bonds and one of ten states that requires a supermajority to approve local G.O. bonds.[9] California is also one of 22 states with a property tax limit and one of 40 states with a local government debt limit.[10] Finally, California is one of 27 states that provides aid for school facility investments via a matching program, and is one of 13 states where state aid is financed via state bond issues.

Furthermore, despite some of California's unique institutional features, most notably the restrictions that Proposition 13 puts on the growth of the assessed value of property, as Figure 3 reveals, California's pattern of school facility spending has been largely consistent with the rest of the United States.[11] Specifically, Figure 3 compares per-pupil K-12 school facility spending in California with spending in the rest of the U.S. between 1990 and 2015. Prior to 2003, school facility spending in California lagged slightly behind the rest of the nation and then rose above the national average and remained above the national average until the Great Recession in 2008.[12] Since the Great Recession, school facility spending in California has mirrored the

[9] Voter approval was lowered to 55 percent in 2000. Prior to this, voter approval was 66.6 percent.
[10] California, elementary and secondary school districts can only issue debt up to 1.25 percent of assessed value, and unified school districts can only issue debt up to 2.5 percent of assessed value.
[11] Proposition 13 limited the sum of all local property tax rates in a jurisdiction to 1% of assessed value and restricted annual increases in the assessed value of property to a maximum of 2% per year. It also prohibited the reassessment of property until the property changed ownership or underwent new construction at which point the property is reassessed at full market value. Consequently, the market value and assessed value of property can diverge significantly in California depending on how long someone has lived in their home.
[12] We discuss in more detail the reasons behind the growth of school facility spending in California in the next section.

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downward trend witnessed in the rest of the nation and has remained close to the national average.

<A> California Context

Similar to most other states, California's system of school facility finance is a cost-sharing partnership between the state and local school districts (Brunner 2006; Vincent 2012). The state provides support for new school construction and modernization projects through the School Facility Program (SFP), which was established in 1998 and funded with state G.O. bond revenue from Proposition 1A, a $9.2 billion state bond initiative approved by voters in November of 1998.[13] The two major programs under the SFP are the New Construction and Modernization programs. Both programs operate on a first-come, first-served basis and combined, make up 78 percent of all state aid for school facilities.[14] The SFP's New Construction Program provides state funds, on a 50/50 state-local cost sharing basis, for eligible costs of approved projects that add capacity to a school district. The SFP's Modernization Program provides state funds on a 60/40 state-local sharing basis for eligible costs associated with approved projects that involve improvements to enhance the physical environment of existing school facilities (such as air conditioning, plumbing, lighting, and electrical systems). To qualify for modernization funding, a school building must be at least 25 years old or, in the case of a portable classroom, at least 20 years old.[15]

[13] Prior to 1998 the State provided support for school facility investments to local school districts through the Lease-Purchase Program of 1976.
[14] The other programs within the SFP include the Critically Overcrowded Schools (COS) program, the Joint-Use Projects program, and the Charter School Facilities program. See Brunner and Vincent (2018) for a more detailed discussion of these programs.
[15] School districts unable to contribute some or all of the local matching funds required for new school construction and modernization projects may apply to the Office of Public School Construction (OPSC) for financial hardship status. If financial hardship status is granted, districts can receive up to 100 percent state funding for eligible new school construction and modernization projects. A very small number of districts qualify for this hardship aid.

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These state school facility programs are funded with revenue raised through voter-approved statewide general obligation bonds. The top panel of Table 1 summarizes the history of statewide school bond initiatives.[16] Since 2001, voters have approved $46.92 billion (measured in constant 2016 dollars) in statewide bonds for K-12 school facilities. This represents over 51% of the total statewide bond revenue raised since the inception of the state school facility program in 1949. Table 1 also illustrates the irregular nature of statewide school facility bond issues. For example, during the five-year period between 2001 and 2005, voters approved over $31 billion (real 2016 dollars) in statewide bonds. In contrast, over the five-year period between 2011 and 2015 no statewide bonds were made available and over the ten-year period between 2006 and 2015 only $8.9 billion in statewide bonds were made available.

Local school districts fund their share of any modernization or new school construction projects primarily with revenue raised through local general obligation bond elections. The bonds are repaid with property tax revenue raised from a special tax assessment on all property located within a school district that remains in effect until the bonds are fully repaid. The bottom panel of Table 1 documents the number of local school bond initiatives held in California since 1986 and the amount of revenue raised through those elections.[17] Between 1986 and 2016, California school districts held a total of 2,156 local general obligation bond initiatives. Of those, 1,532 (71 percent) have been approved by voters. Measured in constant 2016 dollars, these local initiatives have raised over $152.7 billion for school construction and modernization projects. Prior to the passage of Proposition 39 in 2000, local school bond initiatives required approval of

[16] The revenue figures in column 6 are adjusted for inflation using the Producer Price Materials and Components for Construction Index and are reported in constant 2016 dollars.

[17] Due to Proposition 13, school districts were prohibited from issuing local G.O. bonds to finance school facilities from 1978-1986. Proposition 13 capped property tax rates at 1% of assessed value and prohibited property tax overrides. In 1986, California voters passed Proposition 46, which reestablished the authority of local school districts to issue general obligation bonds, subject to the approval of two-thirds of the voters within a district.

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66.7 percent of voters. Proposition 39 lowered that vote threshold to 55 percent. As Table 1 makes clear, since the passage of Proposition 39, both the passage rate of local school bond initiatives and the amount approved have increased significantly.

In addition to voter-approved local G.O. bond revenue, school districts have access to several other smaller sources of revenue for new school construction and modernization projects, the largest of which is developer fees.[18] Specifically, school districts are authorized to impose developer fees on new industrial, commercial, or residential development. Such fees are designed to partially mitigate the costs of building new schools or renovating existing schools to accommodate enrollment growth associated with new developments.

Table 2 summarizes the three largest sources of revenue and total revenue in terms of average revenue per-pupil.[19] The per-pupil revenue figures reported in Table 2 represent the sum of all revenue raised between 1999 and 2007 (top panel) and 2008 and 2016 (bottom panel), divided by the average enrollment over the period. The revenue figures are reported (in constant 2016 dollars) separately for unified, elementary, and high school districts. In both time periods, local G.O. bond revenue tended to comprise the largest source of revenue available to school districts for school facility investments. For example, among unified districts, local G.O. bond revenue accounted for 61 percent of all revenue between 2008 and 2016. Table 2 also reveals that revenue per-pupil available for school facility investments has declined since 2007 for all three types of school districts. These declines are primarily due to declines in statewide bond revenue (consistent with Table 1) and developer fees associated with the Great Recession. Local

[18] California school districts also have other options to raise local funds for school facility investments, but they have generated only a small amount of revenue for school facility investment over time. See Brunner (2006) for a detailed discussion of these other revenue sources.

[19] We discuss the source of the data on school facility revenues in the next section.

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G.O. bond revenue per-pupil, on the other hand, was relatively stable across the two time periods.

To provide further context on the evolution of school facility investments in California over time, Figure 4 documents the historical trend in per-pupil K-12 school facility spending from 1980 to 2016.[20] Spending levels are adjusted for inflation and reported in constant 2016 dollars using the producer price index. As the figure makes clear, school facility spending has fluctuated significantly over time. Part of this fluctuation is due to changes in economic and demographic conditions, such as the Great Recession and periods of declining and expanding enrollment. Political events and fluctuations in the availability of statewide bond revenue have also contributed to the variability of school facility funding.

The continuous rise in school facility spending that occurred between 1984 and the mid-1990's was primarily due to four factors. First, enrollment began to rise in the early 1980's, increasing the demand for new school facilities. Second, between 1984 and 1992, voters approved nine statewide bond initiatives that provided an additional $8 billion for school facilities. Third, in 1986, voters approved Proposition 46, which reestablished the authority of local school districts to issue general obligation bonds, subject to the approval of two-thirds of the voters within a district. Finally, also in 1986, the state legislature passed AB 2926, which authorized school districts to directly impose developer fees to finance new school construction.

Figure 4 also illustrates that school facility funding increased sharply between 1996 and 2005. Again, the significant increase in facility spending was driven by several political events: the passage of four statewide bond issues, notably Proposition 1A in 1998, that provided over

[20] Data on school facility spending over time was obtained from annual school finance records prepared by the California Department of Education, Data from 1980-1987 comes from the "Financial Transactions Concerning School Districts in California," while the data from 1987 to 2016 comes from J200 and SACS accounting records prepared by the California Department of Education.

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$30 billion in additional funding for school facilities and most importantly, the passage of Proposition 39 in November 2000, which lowered the vote requirement on local general obligation bonds from 66.7% to 55%. Finally, between 2007 and 2014, school facility spending fell dramatically before leveling out and rising modestly starting in 2015. Part of this decline is attributable to the Great Recession and its impact on both state and local budgets. For example, the housing crisis that accompanied the Great Recession led to a sharp decline in developer fees, which reduced local revenues for school construction. The decline in developer fees was also accompanied by a decline in statewide support for school facility investments. During the 9-year period between 2007 and 2015, not a single statewide bond issue was placed on the ballot, leading to a sharp reduction in state aid for school facilities.[21]

Figure A1 of the Appendix provides a further illustration of the volatility of school facility investments in California over time. Specifically, the figure compares the normalized level of school facility (capital) spending to current (operational) school spending per-pupil in California over the period 1981 to 2016. As the figure makes clear there was a dramatic (9-fold) increase in capital spending per pupil between 1987 and 2006 relative to current spending per pupil followed by a dramatic decline in spending during and after the Great Recession.

<A> Data

Our primary source of data are the California Department of Education School Finance Accounting Records (the J200 and SACS files) for fiscal years 1986-87 to 2015-16. [22] These

[21] While California received a significant amount of federal funds during the Great Recession from the American Recovery and Reinvestment Act of 2009 (ARRA), the vast majority of those funds were earmarked for K-12 education and were used to stabilize current expenditures. As a result, ARRA funds had little impact on the distribution of facility funding during the Great Recession. This is further supported by the fact that the three largest sources of facility revenue, state G.O. bond revenue, local G.O. bond revenue, and developers fees made up approximately 90% of all facility funding both prior to, during, and after the Great Recession.

[22] Henceforth, we refer to fiscal years using the latter year of the fiscal year. For example, we refer to fiscal year 2015-16 as 2016.

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records contain detailed information on school district capital expenditures and the amount and source of revenue (e.g., state aid, local bond revenue, etc.) available to school districts for facility investments. Because school facility investments tend to be lumpy, in our primary analysis we sum facility revenue and expenditures over a ten-year period and adjust all annual revenue and expenditures to real 2016 dollars using the producer price index.

We augment these financial data with data from EdSource and California's Coalition for Adequate School Housing (CASH) on local bond elections from 1986 to 2016. The general obligation bond election data contains information on all school district G.O. bond elections held in California since 1986 and includes information on the share of "yes" votes, whether the bond proposal was approved by voters, and the dollar amount of bonds proposed.

We combine our data on school facility revenue and expenditures with data on: 1) the assessed value of property within each school district; 2) school district median household income in the district; 3) annual district enrollments; and 4) the share of disadvantaged students enrolled in each school district. Data on district property wealth was obtained from Eastshore Consulting LLC and reflects the valuation utilized for calculation of G.O. bond tax rates and bonding capacity limitations in 2017. Data on the median household income of school districts comes from special school district tabulations of the 2010-2014 American Community Survey (ACS) prepared by the U.S. Census Bureau and the National Center for Education Statistics. Data on the share of disadvantage students comes from the California Department of Education and are based on 2015-16 pupil counts.[23]

[23] We measure the percentage of disadvantaged students in a district as the unduplicated pupil count (UPC) of free or reduced-price meal (FRPM), English learner (EL), and foster youth students divided by total enrollment within a district.

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California contains three types of school districts: Unified, Elementary and High School districts.[24] In most of the empirical work that follows, we present separate analyses for these three types of districts for several reasons. First, the costs associated with school facilities for elementary and high school districts vary because of differences in capital requirements due to the prevalence of science labs, sports facilities, etc. in high schools.[25] Second, as noted previously, similar to school districts in most other states, school districts in California are subject to debt limits. Specifically, school districts may issue additional bonds up to their debt capacity level, which is set at 1.25 percent of assessed value for elementary and secondary districts and 2.5 percent for unified districts. Thus, debt limits may place an institutional constraint on the amount of bond revenue low-assessed value districts can raise. As noted by Vincent (2018), these limits may significantly constrain the ability of many small districts, notably elementary districts, from raising funds through general obligation bond issues.

Finally, in some of our analyses, we are interested in how previous investments in school facilities affect current investments. We use the school facility revenue data from the J200 and SACS school finance accounting records to sum all school facility spending within a district from 1987 to 2006, adjusted for depreciation and divided by district enrollment in 2006.[26]

<A> Results

<B> *The Distribution of School Facility Funding*

[24] As the names suggest, Unified school districts contain both elementary schools and high schools, while Elementary districts contain only elementary schools that feed into a High School district that contains only high schools.
[25] Indeed, the State recognizes these differences in the cost of school facilities. Specifically, new school construction grants and modernization grants are significantly higher for high schools than for elementary schools.
[26] We provide more details on this calculation below.

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The revenue averages reported in Table 2 mask wide variations in the distribution of school facility funding across districts. Table 3 illustrates how per-pupil revenue for new school construction and modernization projects is distributed across school districts over the period 2007 to 2016. The percentiles listed in the table are weighted by the number of students in each district. For example, 10 percent of students in unified school districts were enrolled in a district where total revenue per-pupil was less than $3,915. For each type of school district, the first row gives the distribution of local general obligation bond revenue per-pupil. The second row shows how the distribution changes when state aid per-pupil is added to local G.O. bond revenue. Finally, the third row shows the distribution of total revenue per-pupil (local G.O. bond revenue plus state aid plus all other sources of revenue).

For all three types of school districts, total revenue per-pupil at the 75th percentile is more than triple that of the 25th percentile. These large disparities are primarily due to the distribution of local general obligation bond revenue across districts. For example, in unified school districts, local G.O. bond revenue at the 75th percentile is more than 3.5 times that of the 25th percentile.

<B> *What Explains Variation in Facility Funding Across Districts?*

As noted previously, disparities in school facility investments are driven primarily by two factors: variation in the preferred level of school facilities (notably, the ability to pay for additional school facility investments) and variation between this preferred level and the current stock of capital. Thus, we now turn to an examination of how school facility funding varies with observable measures of ability to pay for capital and the differences between the current level of capital and need for more capital investment.

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Table 4 illustrates the distribution of school facility revenue per-pupil when school districts are separated into quintiles of assessed value per-pupil.[27] The quintiles are weighted by student enrollment so that each quintile contains 20 percent of total student enrollment. As Table 4 reveals, there is a strong positive relationship between total revenue per-pupil and district wealth. For example, among unified districts total revenue per-pupil is nearly twice as high among districts in the top quintile of assessed value per-pupil relative to districts in the bottom quintile.

The positive relationship between facility revenue and assessed value per-pupil is driven by the relationship between local G.O. bond revenue and assessed value: local G.O bond revenue increases rather steadily with assessed values. As a result, compared to districts in the first quintile of assessed value per-pupil, local G.O. bond revenue is over three times higher among districts in the top quintile. The strong positive relationship between local bond revenue and assessed values is partially offset by state aid (i.e., State G.O. Bonds), which is highest among districts with the lowest assessed values.[28] Nevertheless, given that most state aid is allocated on a matching grant basis, districts in the top quintile of assessed value receive more state aid on average than districts in the second, third or fourth quintiles.

Table 5 illustrates the distribution of school facility revenue per-pupil when school districts are separated into quintiles based on median household income (top panel) or quintiles of the percentage of the population age 25 or older with a Bachelor's degree or higher. The

[27] In all tables that examine the distribution of school facility funding, per-pupil revenue is measured as the sum of all revenue raised between 2006-07 and 2015-16 (measured in constant 2016 dollars) divided by the average enrollment over the time period. In addition, we omit Los Angeles Unified from this analysis to ensure that our quintiles are not affected by the large size of the district. Results that include Los Angeles Unified are qualitatively similar.

[28] Districts in the lowest quintile of assessed value per-pupil are the districts that are most likely to qualify for hardship status and be eligible for 100 percent of state funding for school construction and modernization projects.

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quintiles are once again weighted by student enrollment. In the interest of brevity we report results only for Unified districts but note that results are similar for elementary and high school districts. Similar to Table 4, there is a strong positive relationship between median household income and revenue per-pupil. For example, among unified school districts, total revenue per-pupil is nearly twice as high among districts in the top quintile compared to districts in the bottom quintile of median household income ($16,948 vs. $9,090).

As shown in the bottom panel of Table 5, the distribution of facility funding by educational attainment is quite similar to the distribution by income. Specifically, there is a strong positive relationship between facility funding and the percent of the population with a college degree that is driven primarily by the distribution of local G.O. bond revenue. This pattern is consistent with prior studies that tend to find a positive correlation between the percent college educated within a school district and G.O. bond passage and bond revenue per-pupil.

Table 6 shows the distribution of school facility revenue per-pupil when school districts are separated into quintiles based on the percentage of disadvantaged students (top panel) and the percent of Black and Hispanic students within a district (bottom panel). As the top panel of Table 6 reveals, there are rather large disparities in revenue per-pupil between districts with the lowest (1^{st} quintile) and highest (5^{th} quintile) concentrations of disadvantaged students. Among unified districts, local G.O bond revenue per-pupil is over $5,000 higher among districts in the 1^{st} quintile compared to districts in the 5^{th} quintile.[29] While state aid tends to offset some of the disparities in local G.O. bond revenue across quintiles, total revenue per-pupil is nevertheless more than $6,000 higher among districts in the 1^{st} quintile compared to districts in the 5^{th} quintile.

[29] This is perhaps not too surprising given the strong negative correlation between median household income and the percentage of disadvantaged students (-0.77).

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As shown in the bottom panel of Table 6, with the exception of the top quintile, there appears to be no systematic relationship between local G.O. bond revenue or total revenue per-pupil and the percentage of Black and Hispanic students. However, districts with the highest percentage of students of color tend to have lower local G.O. bond revenue than districts in other quintiles. As a result, total revenue per-pupil tends to be significantly lower among districts with the highest percentage of students of color.

In Table 7, we turn our attention to measures of the differences between the preferred level of capital and the current level of capital as determined by past capital investments. Differences between the preferred and current level of capital arise primarily for two reasons: 1) capacity constraints due to enrollment growth and 2) modernization/renovation needs due to the aging of the existing capital stock. We proxy for these two measures using enrollment growth (a proxy for capacity constraints) and prior investments in school facilities (a proxy for modernization needs).

For unified school districts, the top panel of Table 7 illustrates how per-pupil facility funding is related to the growth rate of district enrollment when school districts are separated into pupil-weighted quintiles of enrollment growth. School facility funding appears to be positively related to enrollment growth. Districts in the top quintile of enrollment growth averaged $14,569 per-pupil in total capital revenue compared to $9,714 per-pupil for districts in the bottom quintile. Furthermore, all three of the largest sources of revenue for school facilities tend to be higher among districts with the highest enrollment growth.[30]

[30] Among elementary districts, revenue per-pupil also tends to increase with enrollment growth. However, among high school districts, there appears to be little systematic relationship between enrollment growth and revenue per-pupil.

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The bottom panel of Table 7 illustrates how revenue per-pupil is related to the amount districts spent in previous years on school construction and modernization projects. Previous school facility investment is measured as the sum of all school facility spending within a district from 1987 to 2006 adjusted for depreciation and divided by district enrollment in 2006. Specifically, for each school district, the aggregate value of school facility investment over the 20-year period spanning 1987 to 2006 is calculated as:

$$K_{2006} = \sum_{j=0}^{20} I_j * (1-\delta)^{20-j}$$

where K_{2006} denotes the aggregate value of school facility investment as of 2006, I_j denotes school facility investment in year *j* (1987, …, 2006), measured in constant 2016 dollars, and δ is the geometric rate of depreciation.[31]

One would expect districts that invested heavily in school facilities in prior years would have a smaller gap between the current level of capital and the preferred level. However, facility revenue per-pupil is highest among school districts with the largest prior investments in school facilities. This positive relationship is driven primarily by local G.O. bond revenue and developer fees, which are both substantially higher among districts in the fifth quintile of prior investment than among districts in the first or second quintile.

Finally, Table A1 of the Appendix compares school facility revenue among districts located in cities, suburbs, towns and rural areas respectively. Across all three types of school

[31] Holtz-Eakin (1993) reports an estimate of the depreciation rate of non-residential state and local capital of 4.1 percent. We use his depreciation rate to calculate the aggregate value of school facility investment in prior years. Between 1987 and 2006, a number of California's elementary and high school districts were consolidated into unified districts. For those school districts, we used school district consolidation records, obtained from the California Department of Education, to identify the elementary schools and high schools that merged to form a new unified school district. For the years prior to the formation of a unified school district, we measured total capital outlay for that school district as the sum of all capital outlays made by the elementary and high school districts that eventually consolidated to form the unified district.

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districts, total revenue per-pupil tends to be highest among districts located in cities and suburbs. The differences in total revenue are driven primarily by differences in local G.O. bond revenue; with districts located in cities and suburbs having the highest local G.O. bond revenue and districts located in towns and rural areas having the lowest local G.O. bond revenue.

Collectively, the results above suggest that school facility revenue is highest among districts with the highest household incomes and the highest property-wealth per-pupil. Moreover, school facility revenue tends to be lowest among districts with the highest percentage of disadvantaged students and students of color. One possible explanation for these patterns is that property-wealth is positively correlated with household income and negatively correlated with the share of disadvantaged students. If that were the case, then the patterns seen in Tables 4 through 6 could be related (at least to some degree) to differences in ability to pay for school facilities as measured by assessed value per-pupil.

To examine that possibility, Table 8 illustrates how the characteristics of school districts vary when districts are sorted into quintiles of assessed value per-pupil. We focus on all school districts rather than reporting separate results by district type.[32] The pattern of results in Table 8 is rather striking. Enrollment growth is concentrated in lower assessed value districts, while household income, the share of the population with a Bachelor's degree or higher and the share of non-Hispanic white students vary positively with assessed value. In fact, median household income and the share college educated increase continuously across quintiles of assessed value while the share of disadvantaged students, the share of Hispanic students, and enrollment growth decline continuously across quintiles. Districts in the highest quintile of assessed value also tend to have substantially lower percentages of black students than districts in other quintiles.

[32] If one stratifies the sample based on whether a district is a unified, elementary or high school district, the pattern of results for all three types of school districts looks quite similar to the pattern shown in Table 8.

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Overall, the results reported in Table 8 suggest that characteristics of school districts, such as household income, the share of disadvantaged students, and the share of students of color are all correlated with district assessed values. Thus, Table 8 provides one explanation for the general pattern of results found in Tables 4 through 7: because assessed values are positively correlated with household income and negatively correlated with the share of disadvantaged students and students of color, school facility revenue also varies with these other important characteristics of districts.[33]

Tables 4 to 7 suggest that disparities in school facility funding across districts are primarily driven by the distribution of local G.O. bond revenue. Given that local bond revenue is the largest source of revenue available to school districts for facility investments, we now turn to multivariate regression analysis to better understand the relative importance of property wealth, median household income, enrollment growth and other factors in explaining the wide variation in G.O. bond revenue and total revenue across districts. Here we focus on all local G.O. bond revenue and total revenue raised from 1999 to 2016.

Table 9 reports coefficient estimates from regressions designed to explain: 1) the probability of ever having a successful local G.O. bond election; 2) the amount of local G.O. bond revenue raised per-pupil conditional on having a successful election; 3) state aid for school facility investments per-pupil; and 4) total revenue per-pupil. The dependent variable in column 1 is an indicator variable that takes the value of unity (zero otherwise) if a district ever had a successful G.O. bond election between 1999 and 2016. The estimates reported in column 1 are linear probability estimates implying the estimated coefficients can be directly interpreted as

[33] The simple student-weighted correlation between assessed value per-pupil and household income is 0.49, while the correlation between assessed value per-pupil and the share of disadvantaged and nonwhite students is -0.50 and -0.37, respectively.

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marginal effects. The dependent variable in column 2 is the log of local G.O. bond revenue per-pupil, conditional on ever having a successful local bond election, while the dependent variables in columns 3 and 4 are the log of state aid per-pupil and the log of total revenue per-pupil.[34] In all regressions we include the same set of control variables which capture demographic and economic characteristics of school districts that have been found to influence both the probability of having a successful local G.O. bond election and the amount of revenue raised through local bond elections.[35] Those variables are: 1) the log of assessed value per-pupil; 2) the log of median household income; 3) the log of district enrollment; 4) the growth rate of enrollment between 1999 and 2016; 5) the share of students that are Hispanic; 6) the share of students that are Black; 7) the share of the population age 65 or older; 8) the share of homeowners; and 9) an indicator variable for districts located in a rural area.[36] We also include two indicator variables that take the value of unity (zero otherwise) if a district is an elementary or a high school district.

The results in column 1 of Table 9 suggest that the probability of ever having a successful local G.O. bond election is positively related to a district's assessed value per-pupil and enrollment growth. These results further suggest that districts located in rural areas are approximately 18 percentage points less likely to ever have held a successful local bond election. Similarly, elementary districts and, to a lesser extent, high school districts are also less likely to have ever held a successful local bond election relative to unified school districts.

[34] We construct local G.O. bond revenue per-pupil by dividing the sum of all real ($2016) local bond revenue raised between 1999 and 2016 by average district enrollment over the period 1999-2016.

[35] See for example, Balsdon, Brunner, and Rueben (2003), Wang, Duncombe and Yinger (2011) and Zimmer et al. (2011).

[36] Data on the racial/ethnic composition of school districts comes from the California Department of Education. Data on the share of the population age 65 or older and the share of homeowners comes from the 2010-2014 ACS. Data on school district locale classification come from the National Center for Education Statistics.

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Turning to the results reported in column 2, our results suggest that the amount of revenue raised from local G.O. bond elections, conditional on ever having had a successful bond election, is also positively related to assessed value per-pupil and enrollment growth. Furthermore, consistent with column 1, the amount of revenue raised through local G.O. bond elections is lower in elementary and high school districts relative to unified districts. Finally, in contrast to the results reported in column 1, there is a positive and statistically significant relationship between local G.O. bond revenue per-pupil and household income.

In column 3, where the dependent variable is the log of state aid per-pupil, there appears to be no relationship between district assessed value per-pupil and state aid: the estimated coefficient is small in magnitude and statistically insignificant. Thus, the results reported in column 3 suggest that state aid does little to offset disparities in school facility funding that are driven by district property wealth. In contrast, the estimated coefficient on enrollment growth in column 3 is positive, statistically significant, and relatively large in magnitude. Finally, turning to the results in column 4, we find that total revenue per-pupil is also positively related to assessed value per-pupil and enrollment growth. Furthermore, across all four columns the estimated coefficient on district enrollment is positive and statistically significant, implying larger districts are more likely to issue G.O. bonds, raise more revenue per-pupil when they issue bonds and receive more state aid for school facility investments.[37] If we restrict our sample to

[37] To examine whether the strong correlation between our outcomes of interest and assessed value per pupil persist within regions, we also estimated specifications that included a set of 11 regional fixed effects so that our estimates are now identified off of within region variation in assessed values and other covariates. The regions consist of contiguous counties and are described in detail by Betts, Reuben and Danenberg (2000). The inclusion of regional fixed effects had almost no effect on the magnitude or statistical significance of the estimated coefficient on assessed value per pupil, implying our results are not driven by across region variation in property wealth or other factors correlated with property wealth.

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only districts that raised bond revenue, the results are very similar. We present these results in Table A2 in the appendix.[38]

In summary, the results reported in Table 9 suggest that the probability of having a successful bond election, the amount of bond revenue raised (conditional on having a successful bond election) and total revenue per-pupil are all positively related to assessed value per-pupil. Thus, consistent with our previous results, assessed value per-pupil appears to be an important factor explaining disparities in facility revenue across districts.

To more clearly see how assessed value per-pupil, income, and enrollment growth affect the distribution of local bond revenue per-pupil and total revenue per-pupil, Table 10 presents the predicted level of local G.O. bond revenue per-pupil (top panel) and total revenue per-pupil (bottom panel) calculated using the coefficient estimates reported in columns 2 and 4 of Table 9. Specifically, Table 10 shows how moving from the 25th (10th) percentile of a given variable to the 75th (90th) percentile of that variable affects the level of local bond revenue per-pupil and total revenue per-pupil while holding all other variables at their means.

As Table 10 reveals, differences in assessed value across districts have large effects on local bond revenue per-pupil. All else equal, moving from the 25th to the 75th percentile of assessed value per-pupil leads to approximately an $11,000 (or an 88 percent) increase in local bond revenue per-pupil (conditional on districts having had a successful local bond election). Moving from the 10th to the 90th percentile of assessed value has an even more dramatic effect and leads to approximately a $28,000 increase in local bond revenue per-pupil. Differences in income and enrollment growth have much smaller effects on the distribution of local bond

[38] The only significant difference between Table 9 and Table A2 is that the correlation between Share Age 65 and various outcomes is no longer statistically significant.

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revenue per-pupil. For example, moving from the 25th to the 75th percentile of median household income leads to a $1,836 increase in local bond revenue per-pupil.

As shown in the bottom panel of Table 10, the distribution of predicted total revenue shows a similar pattern. While the disparities in total revenue per-pupil due to differences in assessed value are smaller for total revenue, those disparities are still large. All else equal, moving from the 25th to the 75th percentile of assessed value per-pupil leads to approximately a $6,600 increase in total revenue per-pupil while moving from the 10th to the 90th percentile leads to approximately a $15,000 increase in total revenue per-pupil. Similar to the top panel of Table 10, differences in income and enrollment growth have much smaller effects on the distribution of total revenue. Thus, Table 10 makes clear once again, that assessed value per-pupil is a primary driver of inequities in local G.O. bond revenue per-pupil and subsequently of inequities in total facility revenue per-pupil.

<A> Discussion

In 1971, the California Supreme Court ruled that disparities in current operational funding across school districts that were caused by disparities in school district property wealth violated the equal protection clause of the state constitution. In this paper, we find that the same dynamic at the heart of the *Serrano* decision continues to persist in how California funds school facilities. High-wealth, high-income school districts issue more G.O. debt to fund school capital projects while paying a lower tax rate to fund this debt compared to lower-wealth, lower-income school districts. The existing state school facility program does little to reduce these inequities. Moreover, not only is school facility revenue positively correlated with assessed values and

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household income, but we find that it is also negatively correlated with the share of disadvantaged students and students of color.

These inequities in capital funding naturally raise a question that is beyond the scope of this paper: do these disparities in capital funding lead to differences in the quality of education across school districts? The academic literature examining the impact of school capital funding on student outcomes is mixed. While studies have found positive effects on student outcomes from extremely large capital projects (Lafortune and Schönholzer 2019; Hashim, Strunk, and Marsh 2018; Neilson and Zimmerman 2014), studies that examine more common and generalizable school construction and modernization projects find mixed results (Cellini, Ferreira, and Rothstein 2010; Conlin and Thompson 2017; Martorell, Stange, and McFarlin 2016).[39]

There is growing evidence, however, that regardless of the impact of school facility investments on student achievement, these investments are capitalized into housing values providing evidence that they are clearly valued by local residence (Lafortune and Schönholzer 2019; Cellini, Ferreira and Rothstein 2010). In post-*Serrano* California, where school districts are severely limited in their ability to independently raise significant amounts of local revenue to increase current school funding, capital funding may provide a mechanism for school districts to attract households to their district in a way that current education funding would largely play in the absence of state control.

Moreover, school districts that can raise large amounts of capital revenue may use these funds for building maintenance or instructional-related capital projects. In contrast, school

[39] Both Hashim, Strunk, and Marsh (2018) and Conlin and Thompson (2017) find that student achievement initially declines slightly due to the disruption effects of school facility investments as students must switch to a new school but find positive effects on student achievement several years after students move into a newly built or refurbished school.

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districts unable to raise significant capital funds may have to use current spending to fund these maintenance or small-scale capital projects. Thus, school districts that are better able to access capital funds may use these funds to supplement current funding. Consistent with that notion, Vincent and Jain (2015) found that school districts in California serving low-income students tended to spend less on capital outlays per student and more on maintenance and operations per student than districts serving higher-income students. Similarly, Brunner and Schwegman (2017) found that school districts in Georgia use revenue sources that are statutorily dedicated for capital spending to supplement current spending.

As noted by the Legislative Analyst Office of California, one option to address property wealth related disparities in facility funding across districts in California, is to replace statewide G.O. bond revenue with annual per-pupil grants, which would cover a minimum share of a school district's expected facility needs. Indeed, Duncombe and Wang (2009) find that states that use a lump-sum aid program such as per-pupil grants have the lowest within state inequality in capital spending. The state could then adjust this minimum share based on a school district's property wealth. Under such a system, districts with low assessed value per-pupil would receive a larger share of state funding and districts with high assessed value per-pupil would receive a smaller share. Alternatively, if the state chose to continue providing aid from statewide general obligation bonds, the state could alter its matching rates. School districts with low assessed value per-pupil would have high matching rates, while districts with high assessed value per-pupil would have low matching rates. As noted by Duncombe and Wang (2009), 26 states have a school facility program that adjusts for school district property wealth.

More generally, Filardo et al. (2006) argue that one way to reduce both systematic underinvestment in school facilities and inter-district disparities in capital funding is to increase

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the role state governments' play in funding school facility investments. Consistent with that notion, Biasi, Lafortune and Schönholzer (2021) find that disparities in school facility funding between rich and poor school districts tend to be substantially smaller in states where the state plays a larger role in financing school facility investments. Future research should aim to understand the different state funding regimes for school facility capital investment and which regimes lead to more equitable school facility outcomes from district to district (Duncombe and Wang 2009; Jain and Vincent 2016).

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Table 1: State and Local General Obligation Bond Passage, 1986 to 2016

Years	No. proposed	No. passed	Amount proposed	Amount passed	Real amount passed (2016 $)
State K-12 Education General Obligation Bonds					
1949-85	14	12	$3,790	$3,240	$17,989
1986-90	5	5	$4,000	$4,000	$7,832
1991-95	3	2	$3,800	$2,800	$5,069
1996-00	2	2	$8,725	$8,725	$13,681
2001-05	2	2	$21,400	$21,400	$31,016
2006-10	1	1	$7,329	$7,329	$8,908
2011-16	1	1	$7,000	$7,000	$7,000
Total	28	25	$56,044	$54,494	$91,495
Local K-12 Education General Obligation Bonds					
1986-90	124	65	$2,730	$1,334	$2,584
1991-95	291	127	$8,499	$3,603	$6,210
1996-00	444	282	$23,039	$14,127	$21,938
2001-05	355	285	$28,621	$26,091	$37,234
2006-10	379	290	$37,408	$33,825	$38,401
2011-16	563	483	$51,228	$45,608	$46,397
Total	2,156	1,532	$151,525	$124,588	$152,764

Notes: Data on local bond elections from 1986 – 2016 comes from EdSource and the Coalition for Adequate School Housing (CAHS). Real amounts are reported in constant 2016 dollars and adjusted using the producer price index.

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Table 2: Facility Funding Per-Pupil, by Source

Revenue Source	Unified District	Elementary District	High School Districts
	Per-Pupil Revenue 1999-2007		
Local G.O. Bonds	$5,892	$4,568	$9,874
State Aid	$4,839	$4,715	$6,441
Developer Fees	$1,946	$1,754	$2,359
Total	$13,997	$11,802	$20,006
Districts	327	547	82
Average Enrollment	12,854	2,118	6,210
	Per-Pupil Revenue 2008-2016		
Local G.O. Bonds	$6,144	$3,297	$9,367
State Aid	$2,231	$2,321	$2,121
Developer Fees	$631	$570	$708
Total	$10,048	$6,912	$12,942
Districts	340	506	72
Average Enrollment	12,874	2,298	7,587

Notes: Per-pupil facility revenue figures represent the sums of revenues between 1999-2007 or 2008-2016 divided by average enrollment over the time period. Revenues are reported in real 2016 dollars. Increases in the number of unified districts and declines in the number of elementary and high school districts across time periods is due to district consolidation.

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Table 3: Distribution of Facility Funding Per-pupil: 2007 - 2016

	Percentiles*				
Revenue Sources	10	25	50	75	90
Unified District					
Local G.O. Bonds	$563	$3,387	$7,627	$12,712	$14,649
Local G.O. Bonds + State Aid	$1,624	$5,445	$9,624	$17,556	$18,335
Total	$3,915	$6,529	$11,038	$20,218	$20,365
Elementary Districts					
Local G.O. Bonds	$0	$0	$3,105	$6,998	$13,030
Local G.O. Bonds + State Aid	$0	$1,217	$5,450	$10,564	$14,715
Total	$568	$3,592	$6,796	$13,451	$17,855
High School Districts					
Local G.O. Bonds	$0	$2,739	$9,925	$14,211	$26,041
Local G.O. Bonds + State Aid	$2,191	$5,547	$11,632	$18,623	$29,994
Total	$3,673	$8,860	$13,277	$23,108	$30,414

Notes: Per-pupil facility funding figures represent the sums of revenues from 2007-2016 divided by average enrollment over the time period. Percentiles are weighted by average district enrollment between 2007 and 2016. Revenues are adjusted for inflation and reported in real 2016 dollars.

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Table 4: Distribution of Facility Funding Per-pupil by Quintiles of Assessed Value Per-pupil

Revenue Source	First Quintile	Second Quintile	Third Quintile	Fourth Quintile	Fifth Quintile
Unified Districts	Less than $426.4	$426.4 to $600.7	$600.8 to $840.8	$840.9 to $1,286.5	Greater than $1,286.5
Local G.O. Bonds	$3,883	$3,541	$4,559	$7,349	$13,603
State G.O. Bonds	$3,993	$2,493	$1,875	$1,678	$2,531
Developer Fees	$606	$661	$638	$606	$1,045
Total	$9,728	$7,984	$8,077	$11,115	$18,168
Elementary Districts	Less than $441.4	$441.4 to $754.9	$755.0 to $1,003.8	$1,003.9 to $1,626.2	Greater than $1,626.2
Local G.O. Bonds	$1,268	$2,000	$3,209	$3,837	$6,335
State G.O. Bonds	$3,802	$5,009	$2,871	$2,019	$1,968
Developer Fees	$423	$459	$642	$653	$1,010
Total	$5,683	$8,359	$7,847	$7,485	$10,150
High School Districts	Less than $1,186.7	$1,186.7 to $1,394.1	$1,394.2 to $1,986.6	$1,986.7 to $2,993.8	Greater than $2,993.8
Local G.O. Bonds	$6,384	$5,159	$8,068	$8,220	$17,843
State G.O. Bonds	$3,111	$3,027	$3,236	$1,605	$2,622
Developer Fees	$714	$1,058	$699	$1,284	$923
Total	$11,094	$9,574	$12,931	$11,632	$23,080

Notes: Per-pupil facility funding figures represent the sums of revenues from 2007-2016 divided by average enrollment over the time period. Assessed value per -pupil is for 2017 and is reported in 1,000s of dollars. Quintiles are weighted by average district enrollment over the time period. Revenues are adjusted for inflation and reported in real 2016 dollars.

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Table 5: Distribution of Facility Funding Per Pupil by Quintiles of Median Household Income and Percent College Educated

Revenue Sources	First Quintile	Second Quintile	Third Quintile	Fourth Quintile	Fifth Quintile
			Median Household Income		
Unified Districts	Less than $48,545	$48,545 to $55,775	$55,776 to $65,569	$65,570 to $81,614	Greater than $81,614
Local G.O. Bonds	$4,275	$4,701	$8,282	$8,868	$11,197
State G.O. Bonds	$3,475	$2,499	$1,622	$2,095	$2,471
Developer Fees	$524	$627	$740	$940	$1,466
Total	$9,090	$9,117	$11,841	$13,673	$16,948
			Percent Population 25 or Older with a Bachelor's Degree or Higher		
Unified Districts	Less than 14.4%	14.4% to 23%	23.1% to 31%	31.1% to 41%	Greater than 41%
Local G.O. Bonds	$3,401	$4,788	$6,709	$9,301	$13,804
State G.O. Bonds	$3,512	$2,395	$2,488	$1,966	$2,217
Developer Fees	$585	$593	$802	$1,255	$1,037
Total	$8,577	$8,746	$11,087	$14,701	$18,545

Notes: Per-pupil facility funding figur**es** represent the sums of revenues from 2007-2016 divided by the average enrollment over the time period. Data on district median income and the percent of the population age 25 or older with a bachelor's degree or higher come from the 2010-2014 ACS. Quintiles are weighted by average district enrollment over the time period. Revenues are adjusted for inflation and reported in real 2016 dollars.

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Table 6: Distribution of Facility Funding Per Pupil by Quintiles of Percent Disadvantaged and Percent Black and Hispanic Students

Revenue Sources	First Quintile	Second Quintile	Third Quintile	Fourth Quintile	Fifth Quintile
			Share of Disadvantaged Students		
Unified Districts	Less than 41.0%	41.0% to 58.2%	58.3% to 68.9%	69.0% to 82.3%	Greater than 82.3%
Local G.O. Bonds	$9,796	$7,770	$5,861	$7,213	$4,312
State G.O. Bonds	$2,316	$2,671	$1,953	$3,136	$3,080
Developer Fees	$1,251	$897	$708	$585	$534
Total	$15,531	$12,323	$9,619	$11,883	$9,064
			Percent of Black and Hispanic Students		
Unified Districts	Less than 36%	36% to 53%	54% to 66%	67% to 81%	Greater than 81%
Local G.O. Bonds	$7,582	$7,509	$7,068	$8,764	$4,154
State G.O. Bonds	$2,728	$2,359	$1,976	$3,673	$2,384
Developer Fees	$910	$884	$773	$764	$571
Total	$12,801	$12,196	$11,052	$13,989	$8,132

Notes: Per-pupil facility funding figures represent the sums of revenues from 2007-2016 divided by the average enrollment over the time period. Data on the percentage of disadvantaged students and the percentage of black and Hispanic students is from 2016. Percentage of disadvantaged students represent unduplicated pupil count of free or reduced-price lunch, English Language Learner, and foster students in 2016 divided by district enrollment Quintiles are weighted by average district enrollment between 2007 and 2016. Revenues are adjusted for inflation and reported in real 2016 dollars.

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Table 7: Distribution of Facility Funding Per-pupil by Quintiles of Enrollment Growth and Prior Facility Investments

Revenue Sources	First Quintile	Second Quintile	Third Quintile	Fourth Quintile	Fifth Quintile
			Enrollment Growth		
Unified Districts	Less than -9.4%	-9.4% to -4.6%	-4.5% to -0.1%	0% to 6.5%	Greater than 6.5%
Local G.O. Bonds	$6,356	$8,720	$5,483	$6,474	$8,580
State G.O. Bonds	$2,148	$2,186	$3,768	$1,858	$3,000
Developer Fees	$552	$722	$709	$716	$1,089
Total	$9,714	$12,345	$11,224	$10,659	$14,569
			Prior Facility Investments		
Unified Districts	Less than $5,032.4	$5,032.4 to $6962.4	$6,962.5 to $9,666.9	$9,667.0 to $12,317.4	Greater than $12,317.4
Local G.O. Bonds	$4,991	$5,757	$4,552	$8,934	$11,483
State G.O. Bonds	$2,784	$3,407	$2,474	$2,668	$1,860
Developer Fees	$517	$617	$717	$726	$1,229
Total	$9,222	$10,569	$9,239	$14,195	$15,613

Notes: Per-pupil facility funding figures represent the sums of revenues from 2007-2016 divided by average enrollment over the time period. Enrollment growth is measured as percent change in district enrollment between 2007 and 2016. Prior facility investment is measured as the sum of real district capital expenditures between 1987 and 2006, adjusted for depreciation and divided by 2006 district enrollment. Quintiles are weighted by average district enrollment between 2007 and 2016. Revenues are adjusted for inflation and reported in real 2016 dollars.

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Table 8: Characteristics of Districts by Quintiles of Assessed Value Per-pupil

Characteristic	First Quintile Less than $472	Second Quintile $472 to $674	Third Quintile $675 to $1,024	Fourth Quintile $1,025 to $1,446	Fifth Quintile Greater than $1,446
Median Income	$45,301	$53,799	$59,595	$64,535	$73,628
Percent College Educated	13.30%	18.60%	24.00%	26.20%	36.79%
Percent Disadvantaged Students	75.51%	67.29%	59.52%	57.12%	45.41%
Percent Non-Hispanic White	24.20%	28.46%	39.51%	37.94%	51.67%
Percent Hispanic	63.21%	54.30%	45.11%	43.50%	31.19%
Percent Black	3.84%	4.46%	2.58%	2.88%	1.79%
Enrollment Growth	4.20%	1.89%	0.00%	-1.88%	-5.22%
City	0.16	0.16	0.15	0.22	0.15
Suburb	0.32	0.34	0.36	0.35	0.31
Town	0.24	0.23	0.15	0.11	0.13
Rural	0.28	0.27	0.34	0.32	0.41

Notes: Assessed value per pupil is for 2017 and is reported in 1,000s of dollars. Quintiles are weighted by district enrollment. Enrollment growth is measured as percentage change in district enrollment between 2006 and 2016. Urbanicity designation comes from the NCES local code. City, Suburb, Towns, and Rural are indicator variables for whether a school district is located in a primary city, a suburb of a primary city, a town outside a primary city, or a Census designated rural area, respectively.

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Table 9: Facility Funding Regression Estimates

	(1) Probability of Successful Bond Election	(2) Local G.O. Bond Revenue Per Pupil	(3) State Aid Per Pupil	(4) Total Revenue Per Pupil
Assessed Value Per Pupil	0.109**	0.722***	-0.011	0.458***
	(0.021)	(0.066)	(0.167)	(0.132)
Median Income	-0.002	0.257**	0.325	0.081
	(0.055)	(0.126)	(0.440)	(0.270)
Enrollment	0.108***	0.057*	0.627***	0.374***
	(0.012)	(0.030)	(0.099)	(0.063)
Enrollment Growth	0.129***	0.273***	0.838***	0.625***
	(0.036)	(0.090)	(0.320)	(0.157)
Share Hispanic Student	0.062	0.029	0.233	-0.248
	(0.058)	(0.132)	(0.509)	(0.354)
Share Black Students	-0.114	1.716***	-1.703	-0.413
	(0.179)	(0.479)	(1.690)	(1.066)
Share Age 65 or Older	-0.492*	-0.775	-5.666**	-5.146***
	(0.281)	(0.912)	(2.313)	(1.774)
Share Homeowners	0.099	-0.639**	1.339	1.274
	(0.124)	(0.290)	(1.030)	(0.783)
Rural District	-0.176***	0.028	0.157	0.010
	(0.044)	(0.099)	(0.318)	(0.133)
Elementary District	-0.108***	-0.353***	-0.139	-0.236**
	(0.029)	(0.073)	(0.210)	(0.103)
High School District	-0.087*	-0.175*	-0.021	0.012
	(0.050)	(0.103)	(0.384)	(0.173)
Observations	905	624	905	905
R-squared	0.439	0.463	0.224	0.311

Notes: Dependent variable in column 1 is an indicator that takes the value of unity if a district had a successful local bond election between 1999 and 2016. Dependent variable in columns 2 is the log of local bond revenue per-pupil between 1990 and 2016, conditional on having a successful local bond election. The dependent variable in columns 3 and 4 are the log of state aid per-pupil and the log of total revenue per-pupil between 1999 and 2016. Assessed value per-pupil, median income, and enrollment are measured in logs. Enrollment is measured as average district enrollment between 1999 and 2016. Enrollment growth represents percent change in enrollment between 1999 and 2016. Robust standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$. * $p<0.10$.

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Table 10: Predicted Facility Funding Per-pupil

	Predicted Revenue 10th Percentile	Predicted Revenue 25th Percentile	Predicted Revenue 75th Percentile	Predicted Revenue 90th Percentile	75th - 25th	90th - 10th
			Local G.O. Bond Per Pupil			
Assessed Value per Pupil	$6,028	$8,655	$19,984	$34,361	$11,329	$28,333
Income	$10,306	$10,892	$12,507	$13,286	$1,615	$2,980
Enrollment Growth	$10,365	$10,908	$12,278	$13,123	$1,370	$2,758
			Total Revenue Per Pupil			
Assessed Value per Pupil	$7,519	$9,459	$16,088	$22,692	$6,629	$15,173
Income	$10,376	$10,559	$11,030	$11,242	$471	$866
Enrollment Growth	$8,246	$9,266	$12,146	$14,143	$2,880	$5,897

Notes: Table presents predicted local G.O. bond revenue per-pupil (top panel) and predicted total revenue per-pupil (bottom panel) based on regression estimates reported in Table 9. When predicting revenue percentiles, we hold all other variables (other than the variable listed in column 1) constant at their mean values.

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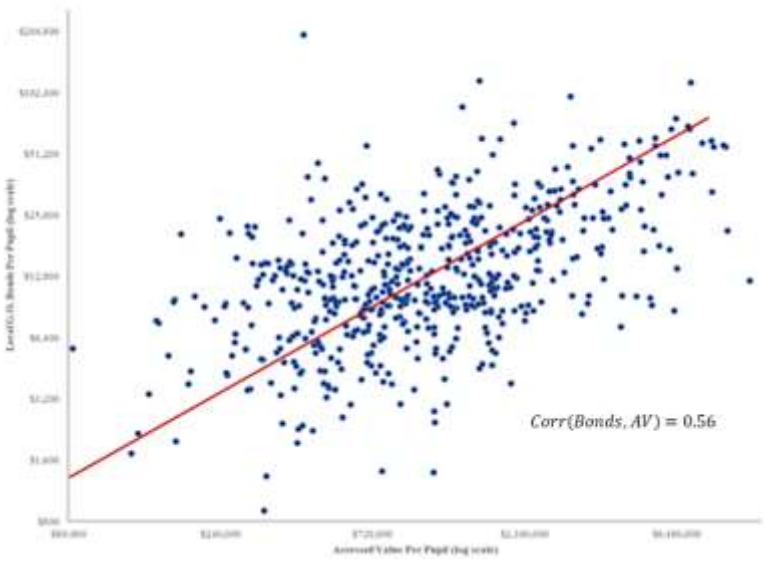
Figure 1: Assessed Value Per-Pupil and Local G.O. Bond Revenue Per-Pupil



Notes: Local G.O. bond revenue per-pupil represents total local bond revenue over the period 2007-2016 divided by average district enrollment over the same period. Districts assessed value per-pupil is for fiscal year 2017 is measured in logs.

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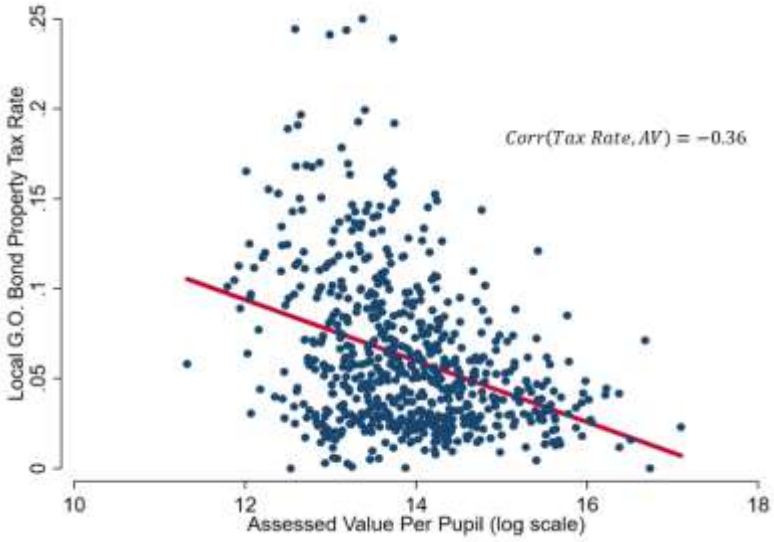
Figure 2: Assessed Value Per-Pupil and School Bond Property Tax Mill Rates



Notes: G.O Bond Tax Rate represents local school district tax rates for G.O. bond election property tax overrides in effect as of 2017-18. Districts assessed value per-pupil is for fiscal year 2017.

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Figure 3: Per-pupil K-12 School Facility Spending: CA versus U.S., 1990 – 2014

Notes: Data on capital expenditures comes from the National Center for Education Statistics (NCES) F33 Finance files. Annual facility spending is measured as the sum of total state and local capital expenditures. Spending levels are adjusted for inflation, with 2016 as the base year.

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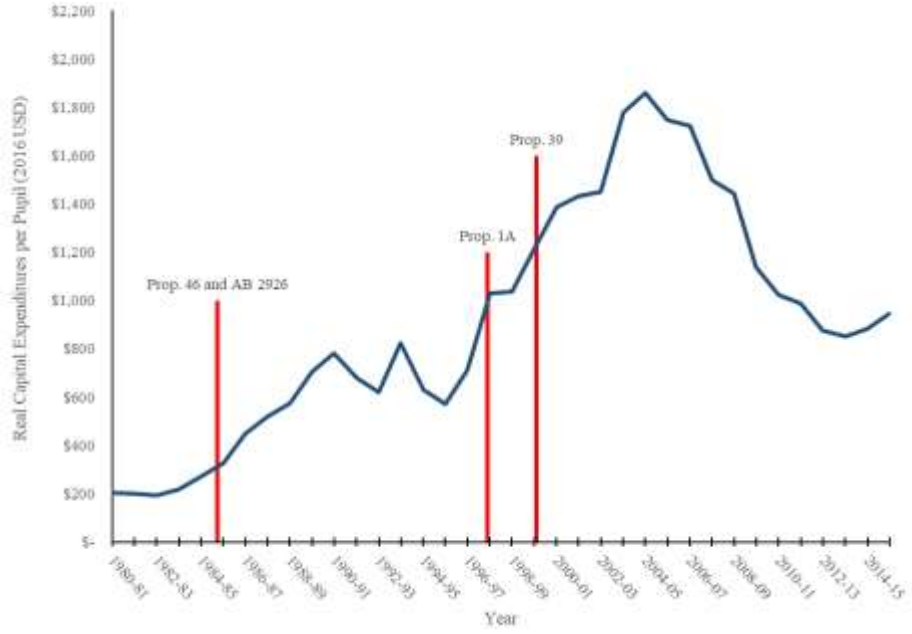
Figure 4: California Per-Pupil K-12 Facility Spending, 1981-2016



Notes: Data on school facility spending comes from the California Department of Education J200 and SACS school district accounting records. Expenditure figures are measured in constant 2016 dollars and represent total capital expenditure of K-12 school facilities in a given year.

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Appendix

Table A1: Distribution of Revenue Per Pupil by Locality

Revenue Source	City	Suburb	Town	Rural
Unified Districts	Less than $47,086.70	Less than $115,008.80	Less than $94,327.30	Less than $63,403.50
Local G.O. Bonds	$10,265	$7,545	$5,018	$5,029
State G.O. Bonds	$2,272	$2,136	$2,741	$3,609
Developer Fees	$825	$793	$1,058	$530
Total	$15,005	$11,858	$10,246	$9,811
Elementary Districts	Less than $46,216,70	Less than $113,484.40	Less than $63,053.30	Less than $88,250.90
Local G.O. Bonds	$6,572	$7,474	$3,081	$1,334
State G.O. Bonds	$1,442	$2,057	$3,495	$3,492
Developer Fees	$753	$683	$672	$766
Total	$9,604	$11,594	$8,353	$5,995
High School Districts	Less than $49,557.30	Less than $80,698.30	Less than $28,080.70	Less than $25,953.70
Local G.O. Bonds	$11,827	$14,453	$6,769	$6,757
State G.O. Bonds	$2,912	$2,101	$3,220	$3,126
Developer Fees	$1,102	$909	$836	$808
Total	$16,837	$19,485	$11,310	$10,741

Notes: Per-pupil facility funding figures represent the sum of revenues from 2007 to 2016 divided by average enrollment over the time period. Revenue figures are reported separately for districts located in principal cities, suburbs of cities, towns, and rural areas, respectively. Revenue figures are adjusted for inflations and reported in real 2016 dollars.

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Table A2: Regression Estimates Limiting Sample to Districts with G.O. Bond Revenue

	(1) Probability of Successful Bond Election	(2) Local G.O. Bond Revenue Per-Pupil	(3) State Aid Per-Pupil	(4) Total Revenue Per-Pupil
Assessed Value Per-Pupil	0.109***	0.722***	0.0518	0.455***
	(0.0211)	(0.0664)	(0.173)	(0.0525)
Median Income	-0.00243	0.257**	-0.300	0.0394
	(0.0550)	(0.126)	(0.449)	(0.108)
Enrollment	0.108***	0.0566*	0.368***	0.0530**
	(0.0124)	(0.0303)	(0.102)	(0.0242)
Enrollment Growth	0.129***	0.273***	0.985***	0.656***
	(0.0363)	(0.0896)	(0.254)	(0.0727)
Share Hispanic Students	0.0620	0.0288	0.164	0.0382
	(0.0584)	(0.132)	(0.507)	(0.113)
Share Black Students	-0.114	1.716***	-0.0464	1.152***
	(0.179)	(0.479)	(1.274)	(0.378)
Share Age 65 or Older	-0.492*	-0.775	0.349	-0.622
	(0.281)	(0.912)	(2.436)	(0.755)
Share Homeowners	0.0993	-0.639**	1.188	-0.0210
	(0.124)	(0.290)	(0.931)	(0.245)
Rural District	-0.176***	0.0282	-0.0318	0.0826
	(0.0439)	(0.0987)	(0.340)	(0.0805)
Elementary District	-0.108***	-0.353***	0.0854	-0.243***
	(0.0287)	(0.0730)	(0.175)	(0.0539)
High School District	-0.0869*	-0.175*	-0.238	-0.123
	(0.0495)	(0.103)	(0.393)	(0.0794)
Observations	905	624	624	624
R-squared	0.439	0.463	0.112	0.38

Notes: Table presents estimates based on specifications identical to those reported in Table 9 except we restrict the sample to districts that issued G.O. bonds between 1999 and 2016 when the dependent variable is state aid per-pupil or total revenue per-pupil. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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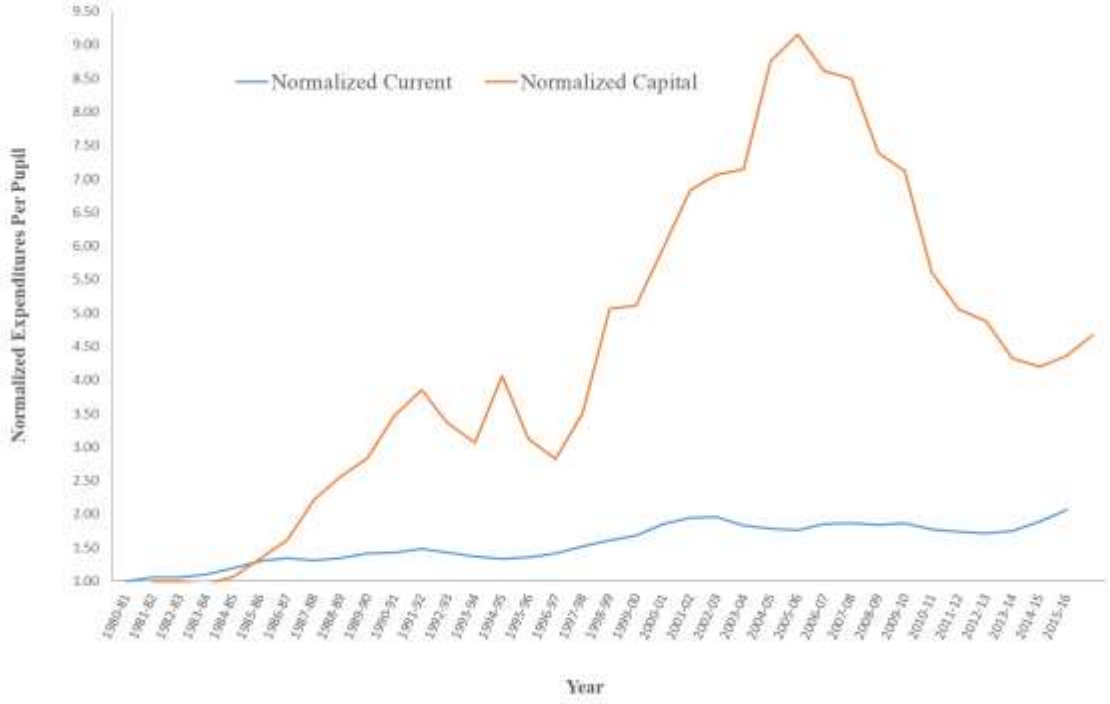
Figure A1: Normalized K-12 Current versus Capital Spending in California, 1981 – 2016.



Notes: Data on current and capital expenditures from 1980-81 through 2015-16 comes from the California Department of Education J200 and SACS school district accounting records. Expenditure figures are measured in constant 2016 dollars and represent total current and capital expenditures in a given year. Expenditure levels are normalized so that expenditures equal one in 1980-81.