

Technical Appendix

# California School District Revenue and Student Poverty

## Moving Toward a Weighted Pupil Funding Formula

Heather Rose and Margaret Weston

Supported with funding from The Silver Giving Foundation and the Stuart Foundation

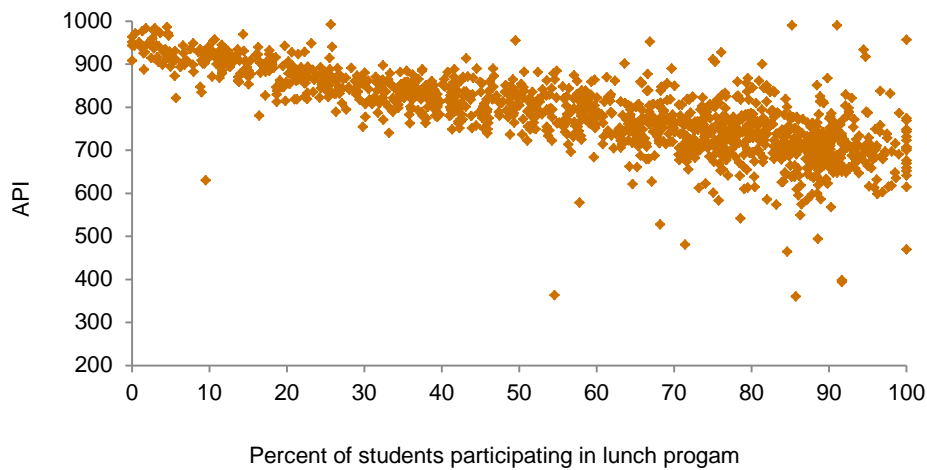
# Introduction

This appendix provides additional tables and figures in support of the accompanying report. The first section focuses on the academic achievement of disadvantaged students. The second section depicts the relationship between various funding categories and disadvantaged students in elementary and high school districts. The third section replicates the analysis of the governor’s proposals using an alternative measure of student disadvantage. The final section presents regression results.

## Student Achievement

The first set of figures shows the relationship between school API and student disadvantage in middle and high schools. School API is negatively related to the percent of students economically disadvantaged.

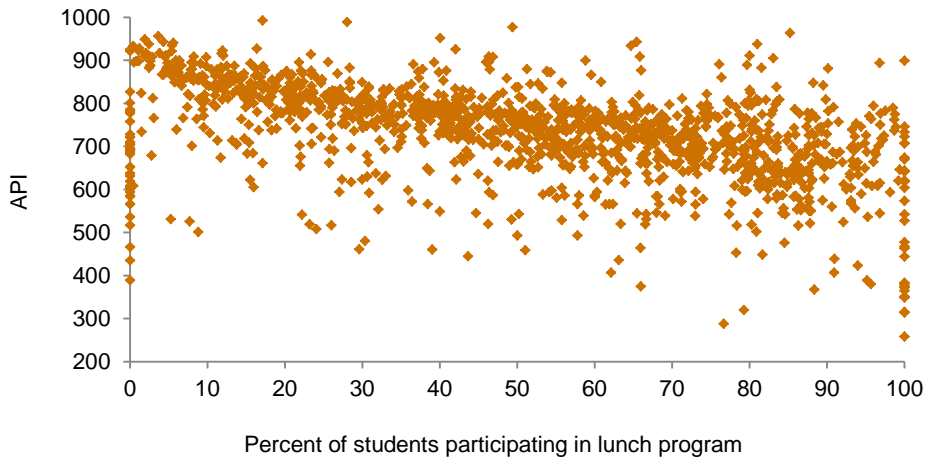
**FIGURE A1**  
Middle school API by percent of economically disadvantaged students



SOURCE: California Department of Education, 2010–11 API files.

NOTE: Figure includes 1,336 middle schools. Alternative and special education schools are excluded, as are 12 schools without a valid subsidized lunch count and 35 without a valid API.

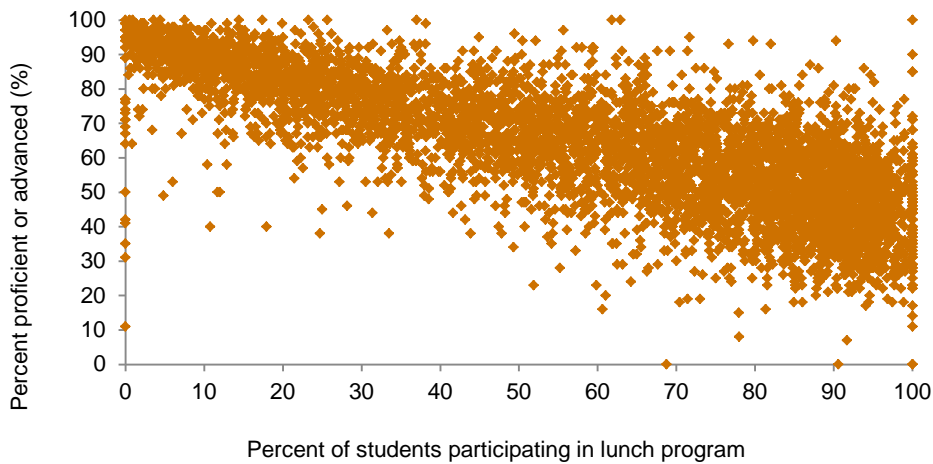
**FIGURE A2**  
High school API by percent of economically disadvantaged students



SOURCE: California Department of Education, 2010–11 API files.  
NOTE: Figure includes 1,410 high schools. Alternative and special education schools are excluded, as are 63 schools without a valid subsidized lunch count and 112 schools without a valid API.

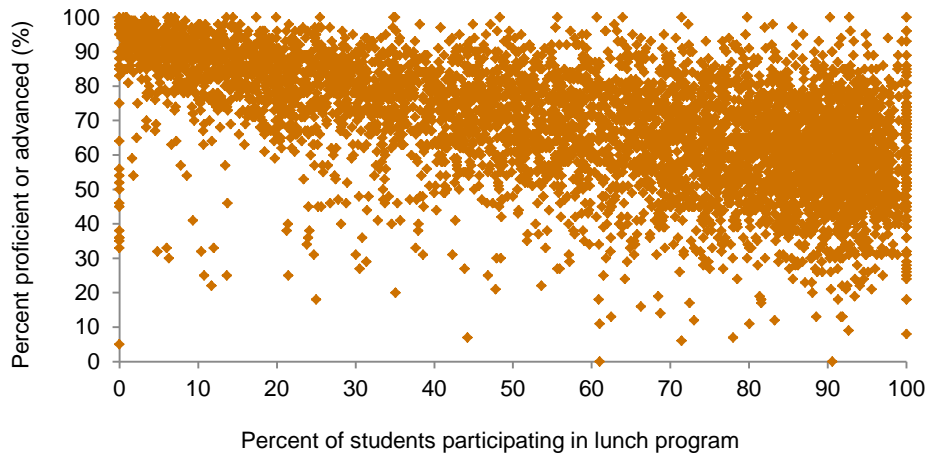
A similar relationship exists between proficiency levels and student disadvantage. The following set of figures displays the percent of students in fourth grade who score proficient or advanced on the English language arts and mathematics California Standards Tests.

**FIGURE A3**  
Grade 4 English language arts proficiency by percent of economically disadvantaged students



SOURCE: California Department of Education, 2011 STAR Test Results.  
NOTE: Figure includes 5,367 schools.

**FIGURE A4**  
Grade 4 mathematics proficiency by percent of economically disadvantaged students



SOURCE: California Department of Education, 2011 STAR Test Results.  
NOTE: Figure includes 5,363 schools.

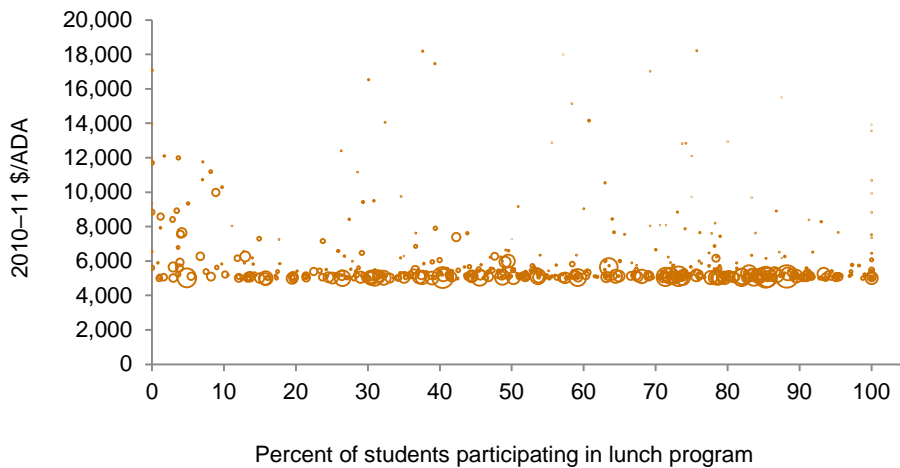
## Funding and Student Disadvantage

In the accompanying report, we show the relationship between four sources of funding and student disadvantage for unified districts. This section replicates the figures and tables for elementary and high school districts.

### Elementary Districts

As in the case of unified districts, revenue limit funds (including excess taxes) in elementary districts are negatively related to student poverty.

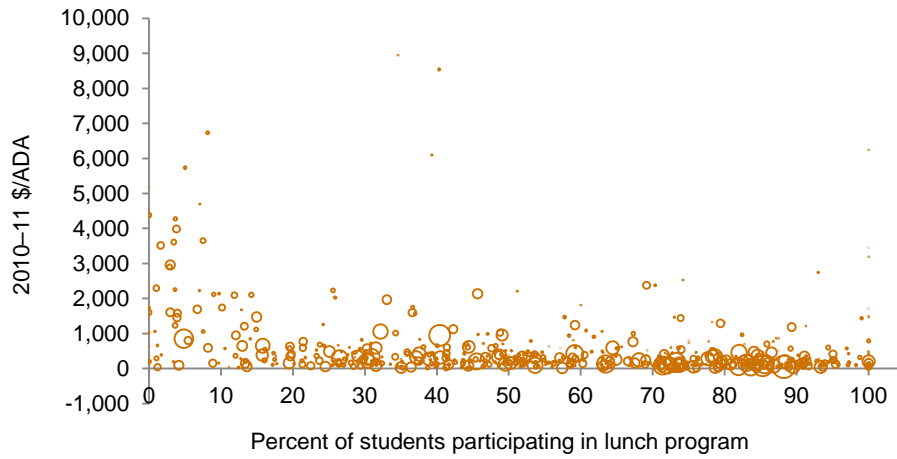
**FIGURE A5**  
Revenue limit funds per pupil, 2010–11



SOURCE: PPIC School Finance Model (2013).  
NOTE: Figure excludes nine districts serving 838 ADA with more than \$20,000 per pupil.

Other local funds are also negatively related to student disadvantage.

**FIGURE A6**  
Other local funds per pupil, 2010–11

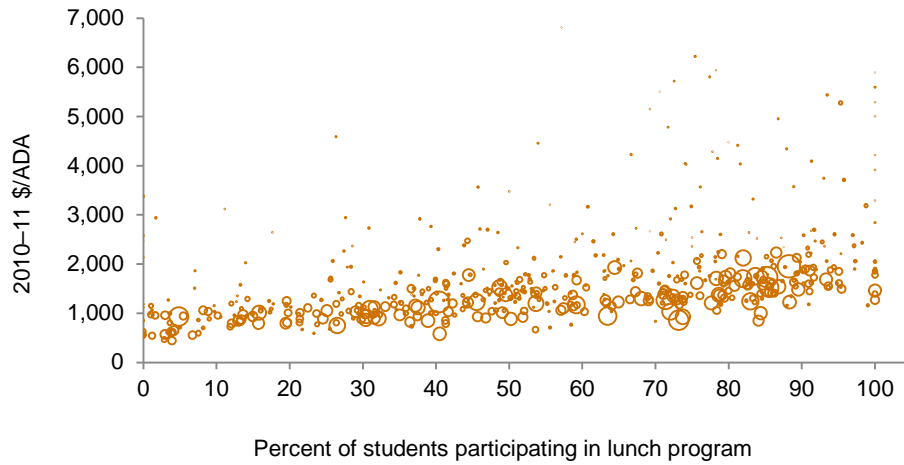


SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes four districts serving 482 ADA with more than \$10,000 per pupil.

State categorical funds are positively related to student disadvantage in elementary districts.

**FIGURE A7**  
State categorical fund per pupil, 2010–11

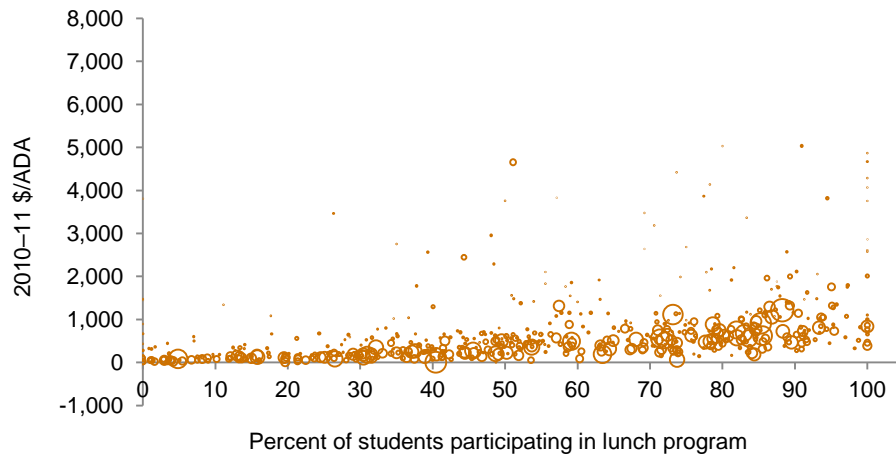


SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes nine districts serving 173 ADA with more than \$7,000 per pupil.

Federal funds are also positively related to student disadvantage.

**FIGURE A8**  
Federal funds per pupil, 2010–11

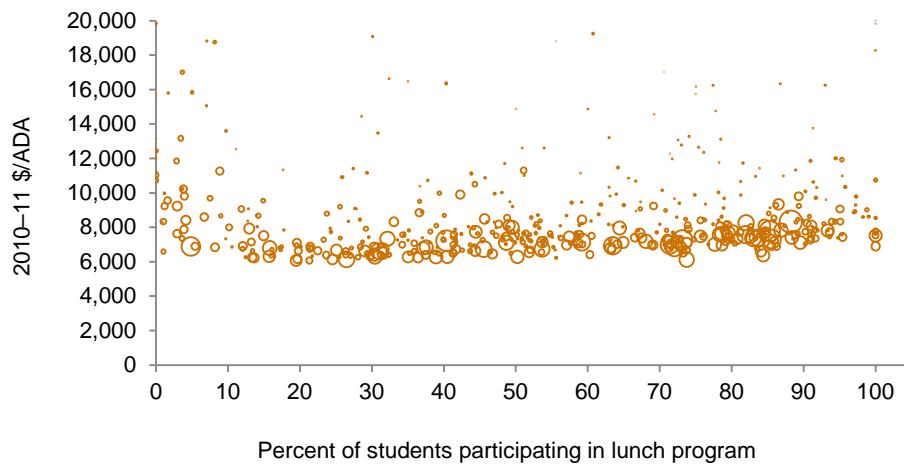


SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes one district serving 8 students with more than \$8,000 per pupil.

When all sources of funding are taken together, there is no statistically significant relationship between funding and student poverty.

**FIGURE A9**  
Total funding per pupil, 2010–11

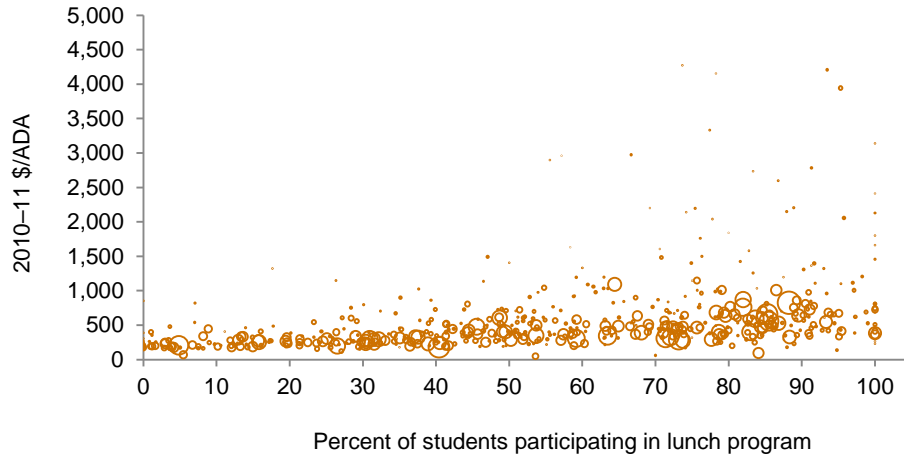


SOURCE: PPIC School Finance Model (2013).

NOTES: Figure excludes 33 districts serving 1,943 ADA with more than \$20,000 per pupil.

As in the case of unified districts, the state categorical programs excluded from the governor's proposal are positively related to student disadvantage.

**FIGURE A10**  
Excluded state programs from governor's proposal, 2010–11



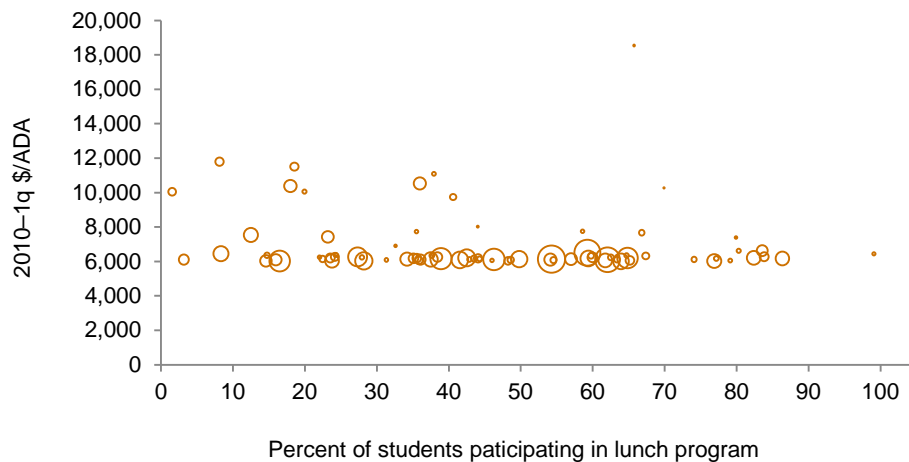
SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes 33 districts serving 1,943 ADA with more than \$20,000 per pupil.

### High school districts

There are 82 high school districts in California. The following figures show the relationship between funding in various categories and student disadvantage.

**FIGURE A11**  
Revenue limit funds by student disadvantage

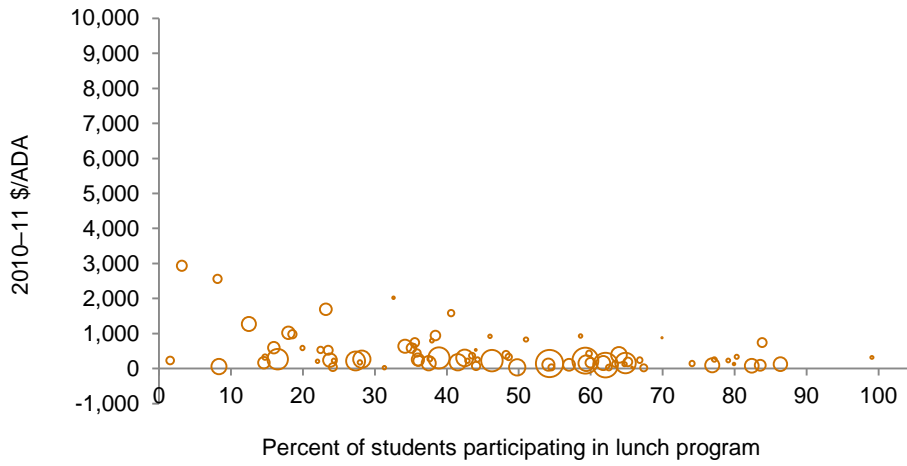


SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes one district serving 961 students with more than \$20,000 per pupil.

As with elementary and unified districts, local funds are negatively related to student disadvantage.

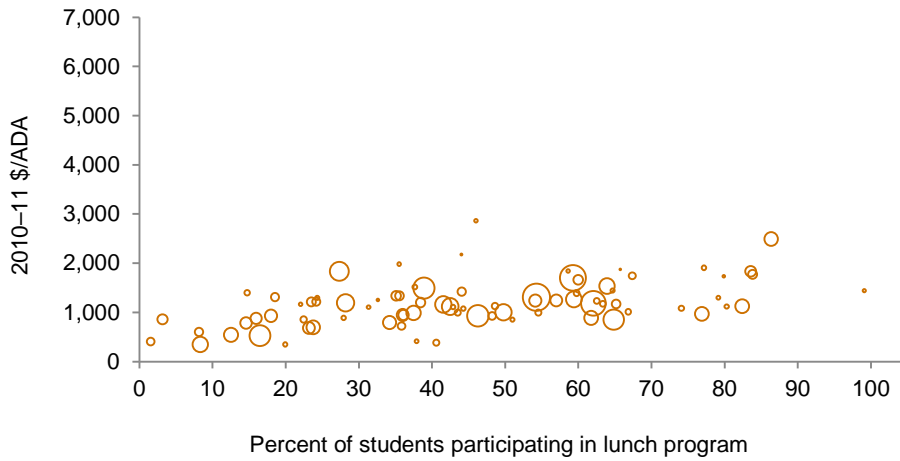
**FIGURE A12**  
Other local funds by student disadvantage



SOURCE: PPIC School Finance Model (2013).

State categorical aid is positively related to student poverty.

**FIGURE A13**  
State categorical funds by student disadvantage



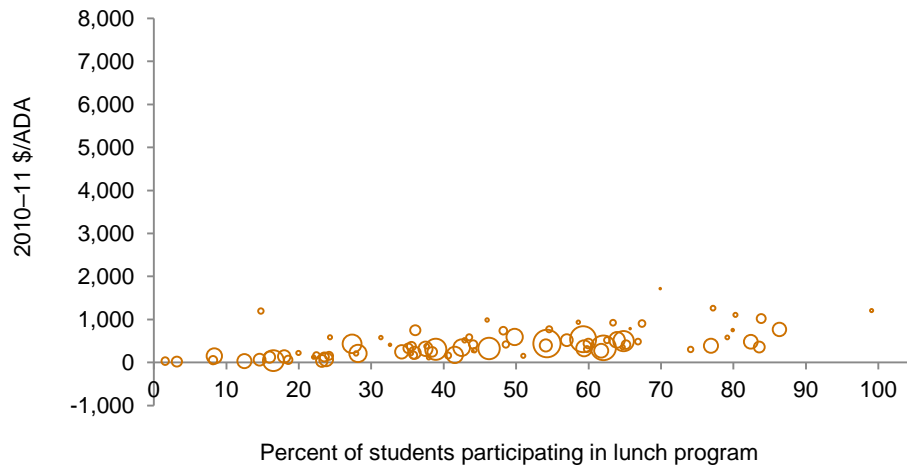
SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes one district serving 90 students with more than \$7,000 per pupil.



Districts with more disadvantaged students receive more federal funds per pupil.

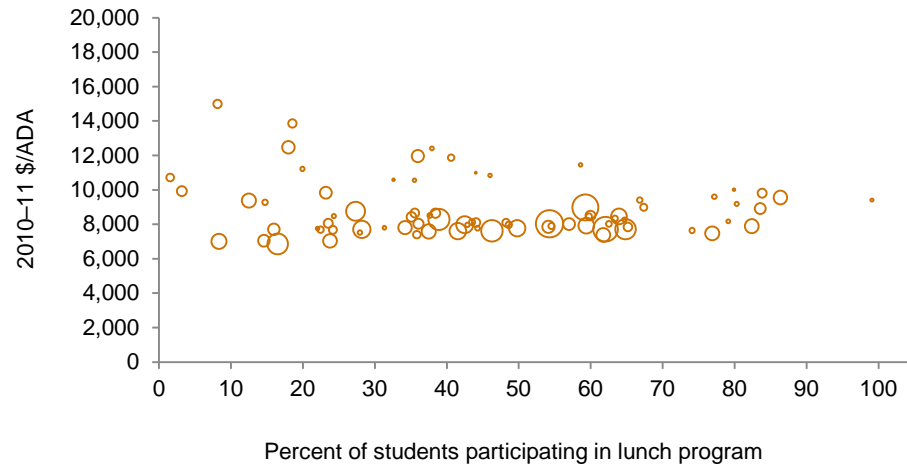
**FIGURE A14**  
Federal funds by student disadvantage



SOURCE: PPIC School Finance Model (2013).

As is the case with elementary districts, there is no statistically significant relationship between total funding and student disadvantage.

**FIGURE A15**  
Total funding by student disadvantage

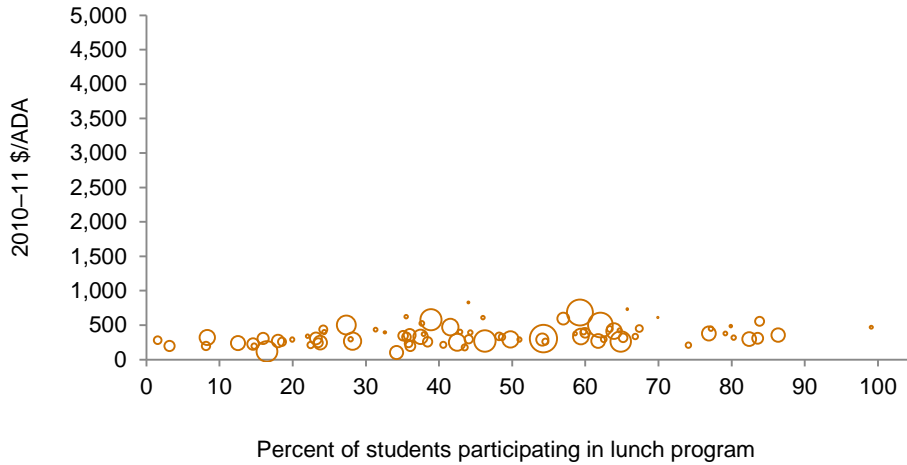


SOURCE: PPIC School Finance Model (2013).

NOTE: Figure excludes three districts serving 1,206 ADA with more than \$20,000 per pupil.

As is the case with unified districts, the state categorical programs excluded from the governor’s proposal are positively related to student disadvantage.

**FIGURE A16**  
**Excluded state programs from governor’s proposal by student disadvantage**



SOURCE: PPIC School Finance Model (2013).  
 NOTE: Figure excludes three districts serving 1,206 ADA with more than \$20,000 per pupil.

### Modeling Proposal with Alternative Measure of Disadvantage

In this section, we replicate some of the tables and figures from the accompanying report using an alternative measure of student disadvantage. In the accompanying report, we limited our measure of disadvantage to students participating in the free or reduced price lunch program. Governor Brown’s definition also includes English learners and foster youth who are not on the subsidized lunch program. The Department of Finance estimates that 75 percent of English learners also participate in the subsidized lunch program. In this section, we create a new measure of student disadvantage equal to the sum of the percent of students who participate in the subsidized lunch program and 25 percent of English learners.

Table A1 provides the disaggregated implicit weight for unified districts using this new measure of student disadvantage. Although the estimates change slightly when using the alternative measure, the overall trends do not.

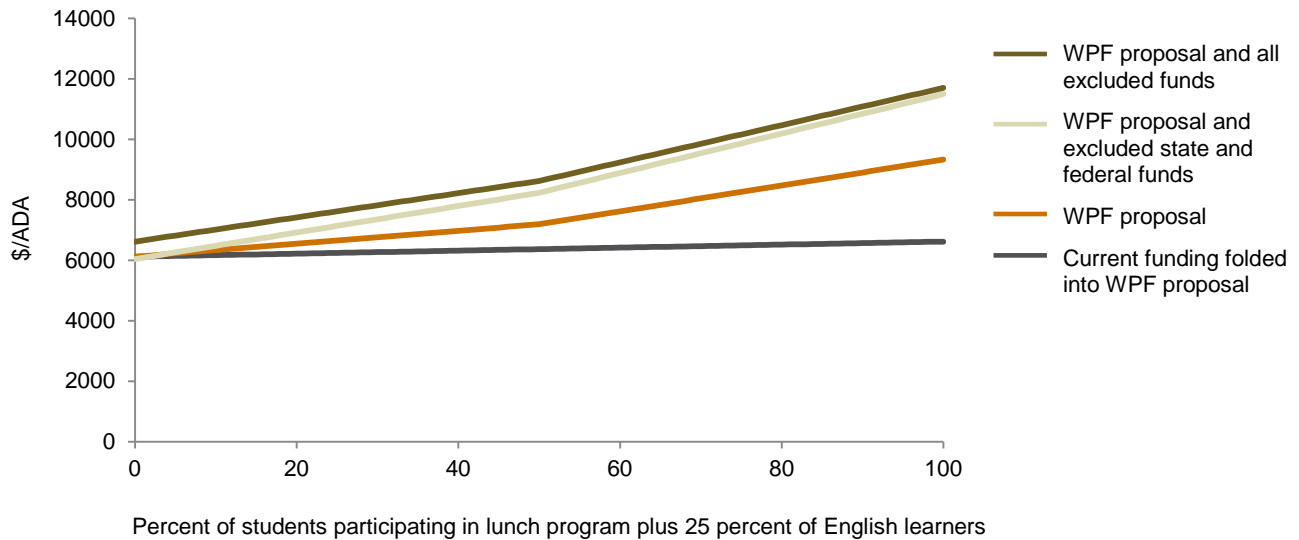
**TABLE A1**  
**Disaggregating the implicit weight for unified districts with base funding of \$6,521 per pupil**

Funding category	Additional funding per disadvantaged students (\$)	Additional funding as a percent of total base (%)
Total	2,217	34
Revenue limits	-324	-5
Local funds	-318	-5
State Categorical Funds	1,650	25
Federal Funds	1,208	19

SOURCE: Author’s calculations based on PPIC School Finance Model (2013).  
 NOTES: Individual weights may not sum to the total weight due to rounding. All relationships are statistically significant at the 0.05 level.

Figure A17 compares funding under the January 2013 proposed formula to current total funding in the subset of programs that would be folded into the governor’s new weighte pupil funding proposal. The grey line plots the average relationship between student disadvantage (defined here as percent receiving subsidized lunches and 25 percent of English learners) and current revenue in the current set of programs that would be consolidated. Unified districts with no disadvantaged students currently receive an average of \$6,109 per pupil and districts with 100 percent disadvantaged pupils receive about \$464 more per pupil, on average, suggesting an implicit weight of 8 percent. The orange line shows revenue per pupil under the governor’s proposal. The tan line adds federal funding and excluded state categorical programs. The dark brown line adds in other local funding as well. These excluded revenues are positively related to student disadvantage: districts in which no students are disadvantaged receive \$458 per pupil and districts in which all students are disadvantaged receive \$1,754 per pupil. Taking all sources of revenue into account, districts in which all students are disadvantaged would receive \$11,500 per pupil, approximately 75 percent more than in districts with no disadvantaged students.

**FIGURE A17**  
**Modeling Governor Brown’s 2013 proposal**



SOURCES: PPIC School Finance Model (2013); Governor’s Budget Proposal Summary, 2013–14.

NOTES: “Brown’s proposal” excludes the following: special education, after-school education and safety (Prop 49), Quality Education Investment Act, TIIBG, home-to-school transportation, lottery, mandates, state meals, federal funds, and local funds. The proposal includes two regional programs excluded from ROCPS and the teacher credentialing block grant.

## Regression Results

Table A2 provides the OLS-regression results for all districts as well as for elementary, high school, and unified districts separately. Each row represents a separate regression. The dependent variable in each regression is the district per-pupil revenue in the specified category. Table A2 shows the revenue categories used in the accompanying report, while Table A3 includes large state categorical programs, followed by local parcel taxes and the federal Title I program. The independent variable in each regression is the proportion of students in the district who participate in the subsidized lunch program, and the dependent variable is funds per pupil. Each regression is weighted by district ADA.<sup>1</sup>

The constant in each regression can be interpreted as the average amount of revenue per pupil in a district with 0 percent of students in the subsidized lunch program; thus the amount generated by each non-disadvantaged student. The coefficient in each regression represents the additional per-pupil revenue in going from a district with 0 percent of students in the subsidized lunch program to a district with 100 percent of students in the program. Therefore, the slope can be interpreted as the additional revenue each disadvantaged student generates, on average. For example, consider the row with total revenue per pupil. A district with half its students in the subsidized lunch program would be expected to receive \$7,061 for each of its students, plus an additional \$1,437 for half of its students, leading to an overall total revenue per pupil of \$7,780. It's as if each non-disadvantaged student generates \$7,061 and each disadvantaged student generates \$8,498, for an average of \$7,780 per pupil.

To check for nonlinearities, we plotted the residuals against the fitted values for each regression and found no obvious cases of concern. We also included dummy variables at the 50 percent threshold of subsidized lunches to allow the slope to change and see if current funding follows some sort of concentration factor; it does not.

**TABLE A2**  
Regression output for large categories of district revenue, by district type

Program	All districts		Elementary		High school		Unified	
	Constant	Coefficient	Constant	Coefficient	Constant	Coefficient	Constant	Coefficient
Revenue limits	5,888*** (104)	-719*** (150)	5,605*** (122)	-612*** (168)	7,181*** (395)	-1,493** (661)	5,612*** (115)	-354** (168)
Revenue limits (no excess taxes)	5,450*** (40)	-124** (63)	5,089*** (20)	69** (30)	6,082*** (240)	286** (124)	5,324*** (25)	25 (48)
Local revenue	688*** (71)	-570*** (144)	982*** (99)	-1,004*** (137)	771*** (193)	-968*** (344)	575*** (98)	-372* (195)
State categoricals	583*** (85)	1,541*** (306)	732*** (35)	1,003*** (75)	667*** (144)	1,095*** (307)	507*** (121)	1,783*** (403)
Federal funds	-97** (44)	1,184*** (159)	-71** (31)	938*** (69)	29 (42)	723*** (93)	-128** (62)	1,316*** (202)
Total revenue	7,061*** (200)	1,437** (579)	7,248*** (171)	326 (253)	8,648*** (550)	-643 (985)	6,567*** (268)	2,372** (752)
Governor's programs in WPF	6,423*** (107)	43 (180)	6,190*** (118)	-98 (164)	7,650*** (417)	-518 (737)	6,118*** (120)	498** (212)
Excluded funds from WPF	684*** (144)	1,390** (481)	1,065*** (109)	423** (169)	1,040*** (204)	9 (378)	497** (207)	1,871*** (632)

SOURCE: PPIC School Finance Model (2013).

NOTE: Robust standard errors are in parentheses. \* represents pvalue<0.1 \*\*<0.05 \*\*\*<0.01.

<sup>1</sup> For data sources and the ADA measures used in the PPIC School Finance Model and this report, see the model's accompanying Instruction Manual for the PPIC School Finance Model (2013).

**TABLE A3**

Regression output for individual state categorical programs and selected other revenues, by district type

Program	All districts		Elementary		High school		Unified	
	Constant	Coefficient	Constant	Coefficient	Constant	Coefficient	Constant	Coefficient
Adult education	56.24*** (20.39)	101.26* (60.13)			159.87** (91.13)	156.55 (224.14)	25.11 (24.64)	181.98** (72.48)
ASES (Prop 49)	-39.80*** (5.35)	211.40*** (14.96)	-50.17*** (8.11)	253.19*** (19.32)	-2.11 (2.31)	13.45* (7.94)	-29.53*** (6.88)	199.24*** (19.48)
CSR 9	24.47*** (2.66)	-18.63*** (5.21)			49.36*** (14.36)	-11.57 (31.27)	24.05*** (12.96)	-17.77*** (6.61)
CSR K-3	175.36*** (13.48)	97.89*** (22.94)	370.73*** (17.98)	-36.73 (30.92)			175.78*** (8.88)	91.35*** (20.50)
EIA	-18.14*** (5.41)	333.74*** (11.96)	-16.55** (8.12)	359.51*** (15.24)	19.19*** (6.76)	186.97*** (15.98)	-16.67** (7.62)	330.03*** (16.66)
Home-to-school (regular only)	25.56*** (4.09)	48.75*** (7.86)	35.94*** (6.28)	32.11*** (11.15)	29.45*** (10.52)	14.84 (24.25)	22.84*** (5.71)	55.89*** (10.99)
Instructional materials	55.07*** (0.49)	6.38*** (1.16)	52.30*** (1.05)	7.29*** (1.42)	57.99*** (0.81)	3.95** (1.78)	55.15*** (0.60)	6.91*** (1.42)
Grade 6-12 counseling	33.20*** (1.66)	-7.17*** (2.58)	11.54*** (1.15)	-0.02 (2.07)	60.21*** (0.99)	4.16** (2.08)	30.00*** (0.56)	-0.55 (0.90)
QEIA	-53.12*** (11.12)	199.61*** (35.29)	-27.40*** (7.96)	106.80*** (22.77)	-12.93 (20.80)	132.42 (86.11)	-75.52*** (15.66)	250.29*** (44.67)
ROCP	39.34*** (9.40)	-6.42 (22.91)			37.37 (30.52)	137.12* (74.82)	39.66*** (13.23)	-4.38 (32.54)
Special education	719.22*** (18.70)	82.41 (66.15)	757.19*** (9.85)	-46.50*** (13.92)	772.21*** (19.81)	-78.70** (35.06)	694.04*** (26.89)	149.43* (87.21)
Summer schools	30.78*** (4.44)	47.62*** (13.15)	15.87*** (2.05)	24.75*** (4.96)	39.67*** (11.66)	133.01*** (30.53)	23.11*** (5.36)	63.57*** (16.67)
School & library improvement	51.52*** (2.66)	25.67*** (4.54)	78.82*** (3.14)	15.71*** (4.94)	26.11*** (4.08)	-24.18*** (7.14)	55.58*** (2.63)	19.37*** (5.19)
TIIBG	-27.45 (55.18)	321.35 (205.84)	24.20** (10.30)	56.17** (25.16)	58.13** (23.67)	-17.03 (30.71)	-63.41 (81.04)	451.32 (276.47)
Parcel taxes	201.14*** (34.49)	-268.90*** (49.85)	301.44*** (59.65)	-391.65*** (82.41)	290.76** (136.73)	-494.05** (243.44)	152.05*** (42.07)	-195.04*** (60.24)
Title I	-165.87*** (56.15)	1,012.20*** (208.79)	-117.37*** (25.69)	702.80*** (63.98)	-36.80 (26.76)	569.47*** (66.23)	-210.18*** (79.83)	1,172*** (272.41)

SOURCE: PPIC School Finance Model (2013).

NOTE: Robust standard errors are in parentheses. \* represents pvalue<0.1 \*\*<0.05 \*\*\*<0.0.



**PPIC**

PUBLIC POLICY  
INSTITUTE OF CALIFORNIA

The Public Policy Institute of California is dedicated to informing and improving public policy in California through independent, objective, nonpartisan research on major economic, social, and political issues. The institute's goal is to raise public awareness and to give elected representatives and other decisionmakers a more informed basis for developing policies and programs.

The institute's research focuses on the underlying forces shaping California's future, cutting across a wide range of public policy concerns, including economic development, education, environment and resources, governance, population, public finance, and social and health policy.

PPIC is a private operating foundation. It does not take or support positions on any ballot measures or on any local, state, or federal legislation, nor does it endorse, support, or oppose any political parties or candidates for public office. PPIC was established in 1994 with an endowment from William R. Hewlett.

Mark Baldassare is President and Chief Executive Officer of PPIC.

Gary K. Hart is Chair of the Board of Directors.

Short sections of text, not to exceed three paragraphs, may be quoted without written permission provided that full attribution is given to the source and the above copyright notice is included.

Research publications reflect the views of the authors and do not necessarily reflect the views of the staff, officers, or Board of Directors of the Public Policy Institute of California.

Copyright © 2013 Public Policy Institute of California  
All rights reserved.  
San Francisco, CA

PUBLIC POLICY INSTITUTE OF CALIFORNIA  
500 Washington Street, Suite 600  
San Francisco, California 94111  
phone: 415.291.4400  
fax: 415.291.4401  
[www.ppic.org](http://www.ppic.org)

PPIC SACRAMENTO CENTER  
Senator Office Building  
1121 L Street, Suite 801  
Sacramento, California 95814  
phone: 916.440.1120  
fax: 916.440.1121