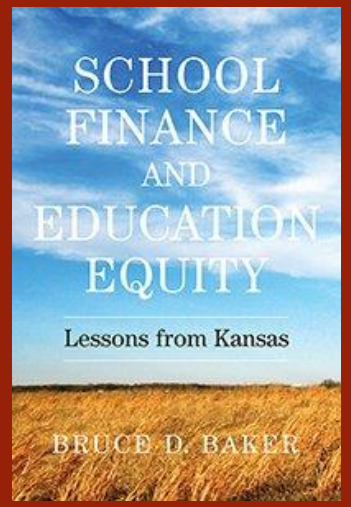
Toward Standard Conceptions & Measures in School Finance

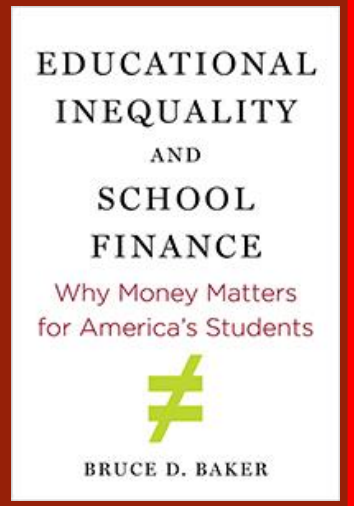
Plenary Session

National Education Finance Academy

Bruce D. Baker

Rutgers University





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Topics

- Measuring School Finance (& the SFID)
  - Linking conceptual framing to empirical models
  - Findings
  - Causes
- Toward Common Conceptions & Measures
  - Equal Opportunity to Achieve Common Outcomes
  - Methods & models for evaluating spending & revenue variation
- Notes on Racial Disparities
- School Finance Indicators Database
  - Data and tools for research, policy advocacy and teaching

But First
Some School Finance Facts!

Trends in School Funding & Schooling Resources

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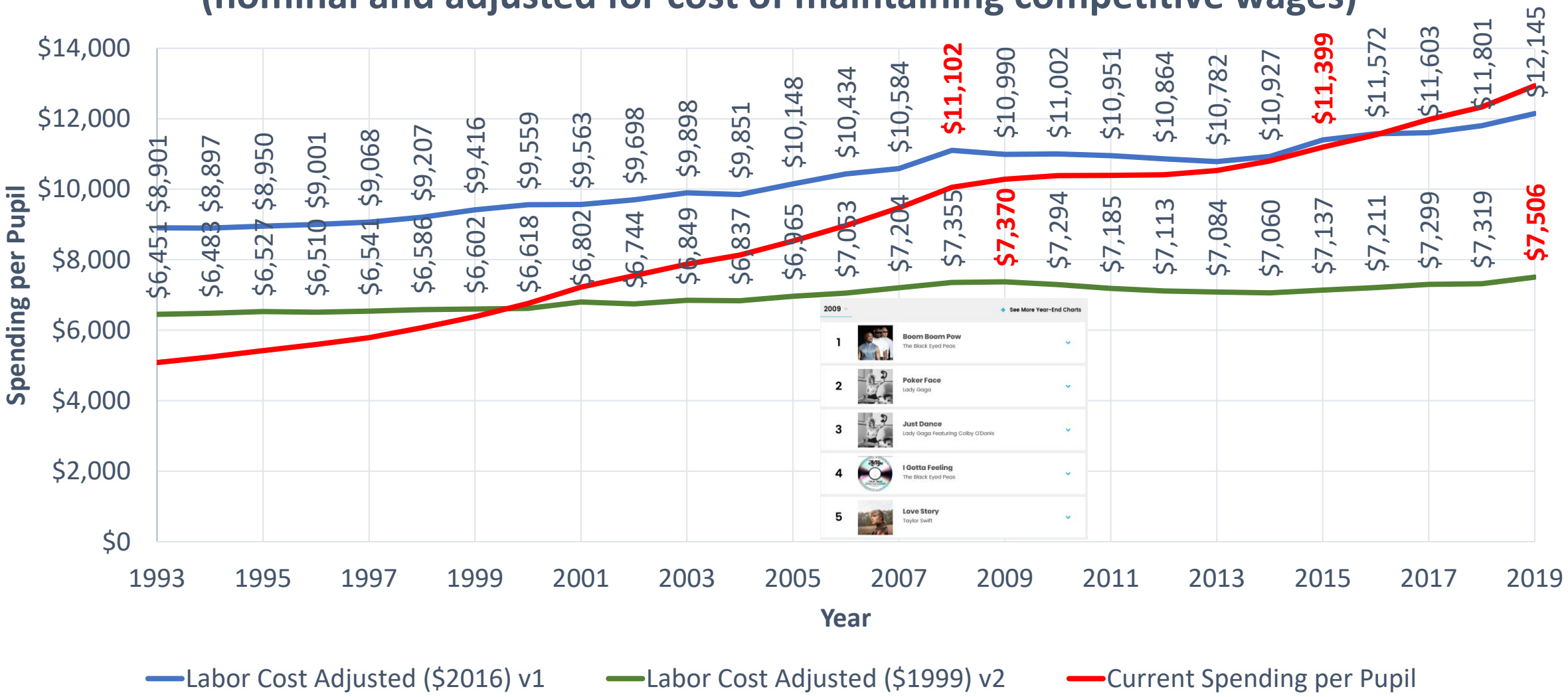
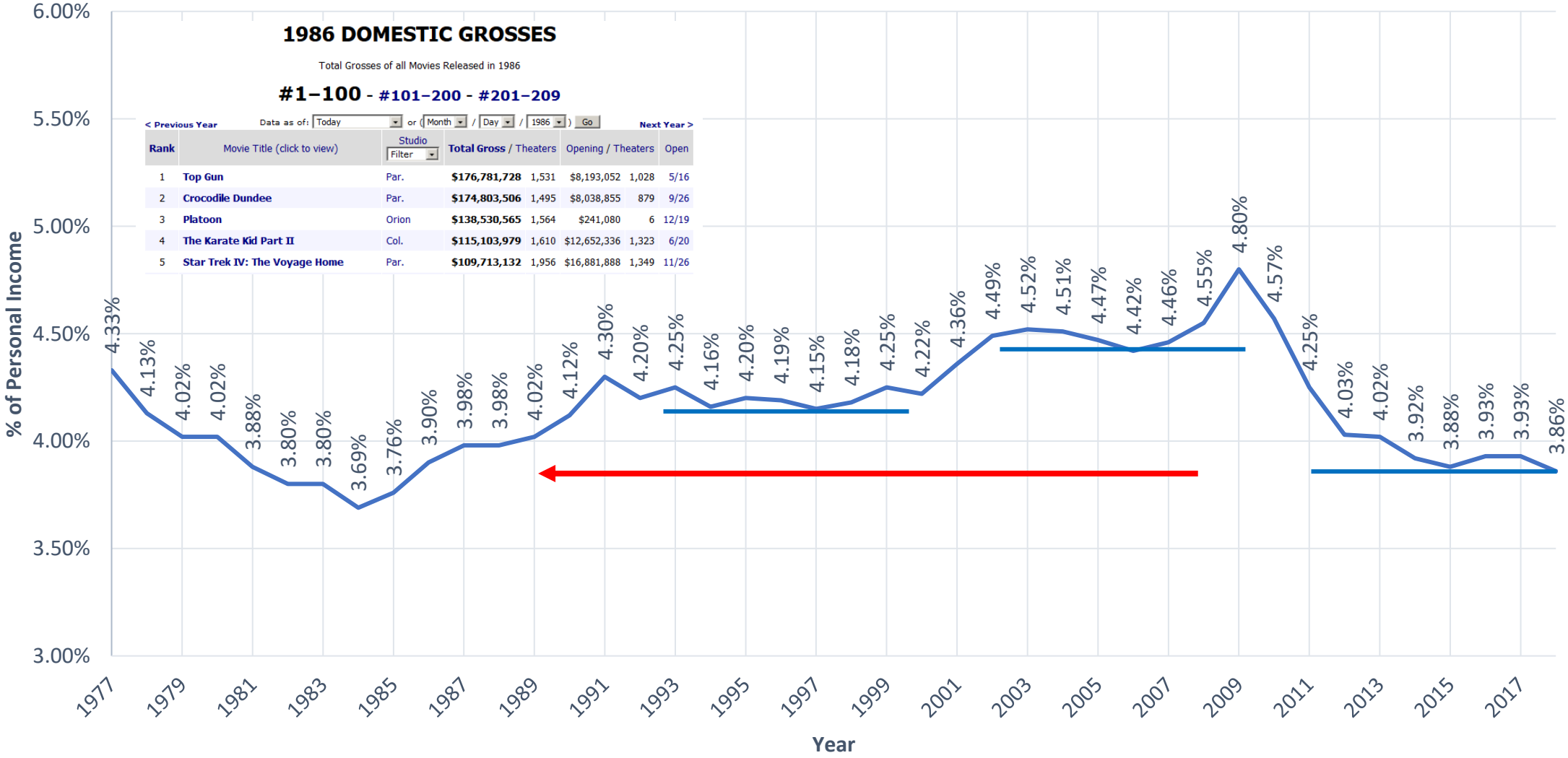
Current Spending per Pupil over Time
(nominal and adjusted for cost of maintaining competitive wages)



Data source: http://schoolfinancedata.org/download-data/ (District Level Panel)

Education Spending Effort over Time
(E027) Elem Educ-Direct Exp



State & Local Government Finance Data Query System. http://www.taxpolicycenter.org/slf-dqs/pages.cfm. The Urban Institute-Brookings Institution Tax Policy Center. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances, Government Finances, Volume 4, and Census of Governments (Years). Date of Access: (03-Sep-19 11:55 AM)

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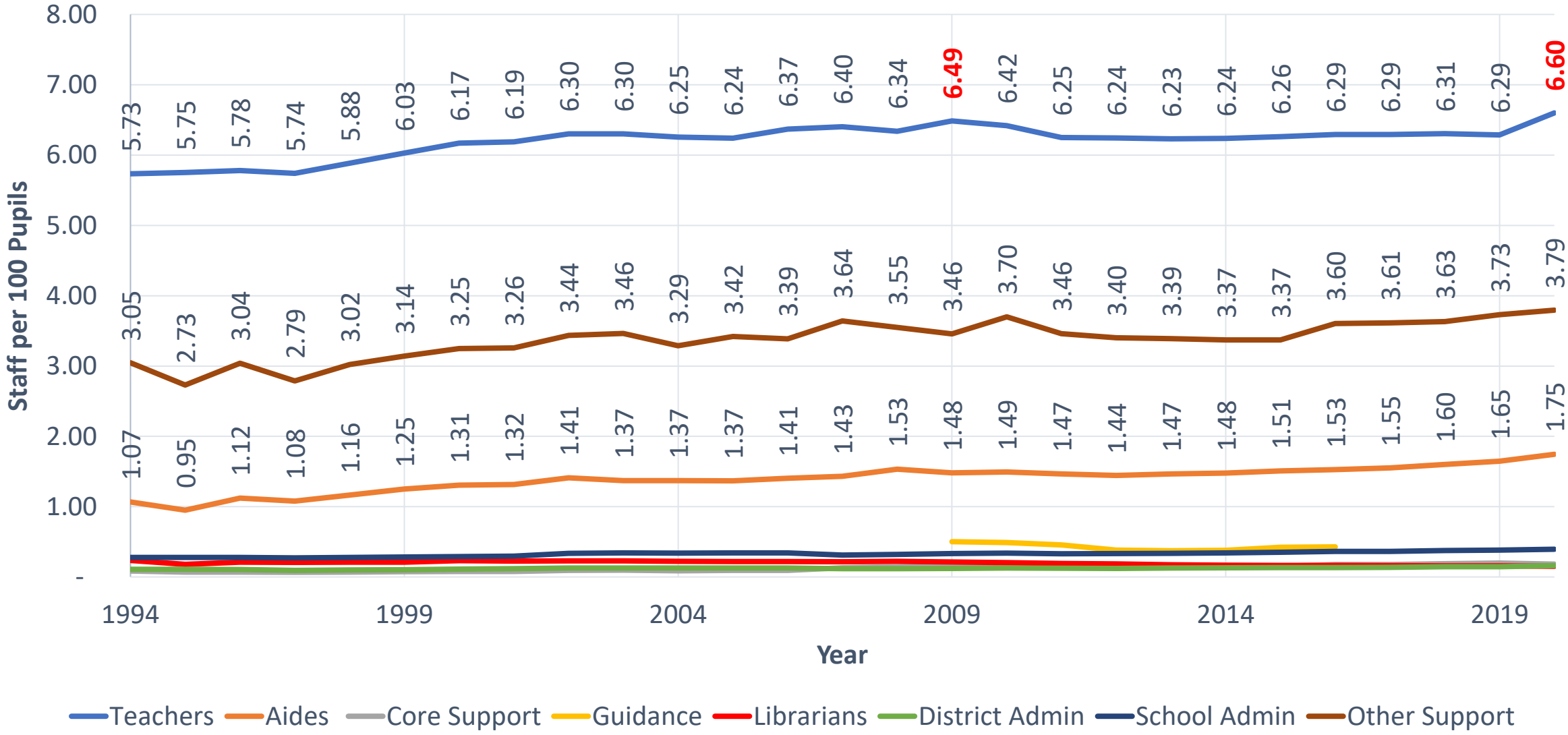
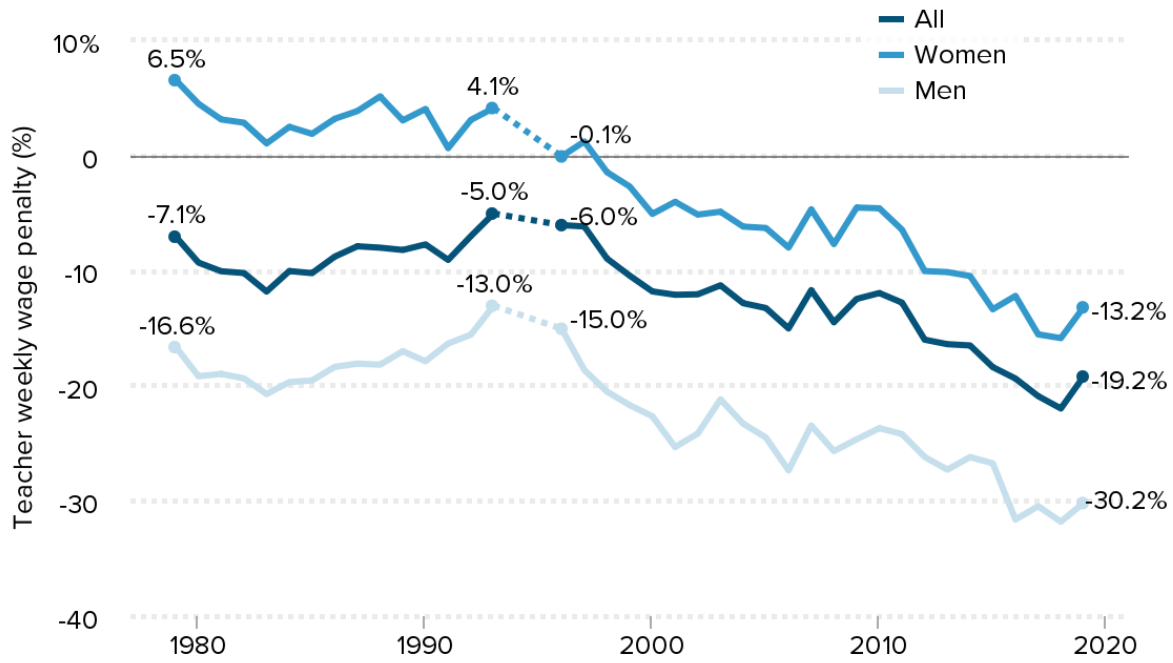
Staffing per 100 Pupils



Data source: http://schoolfinancedata.org/download-data/ (District Level Panel)

Teachers earn 19.2% less than comparable college graduates

Teacher weekly wage penalty (or premium) for all teachers and by gender, 1979–2019

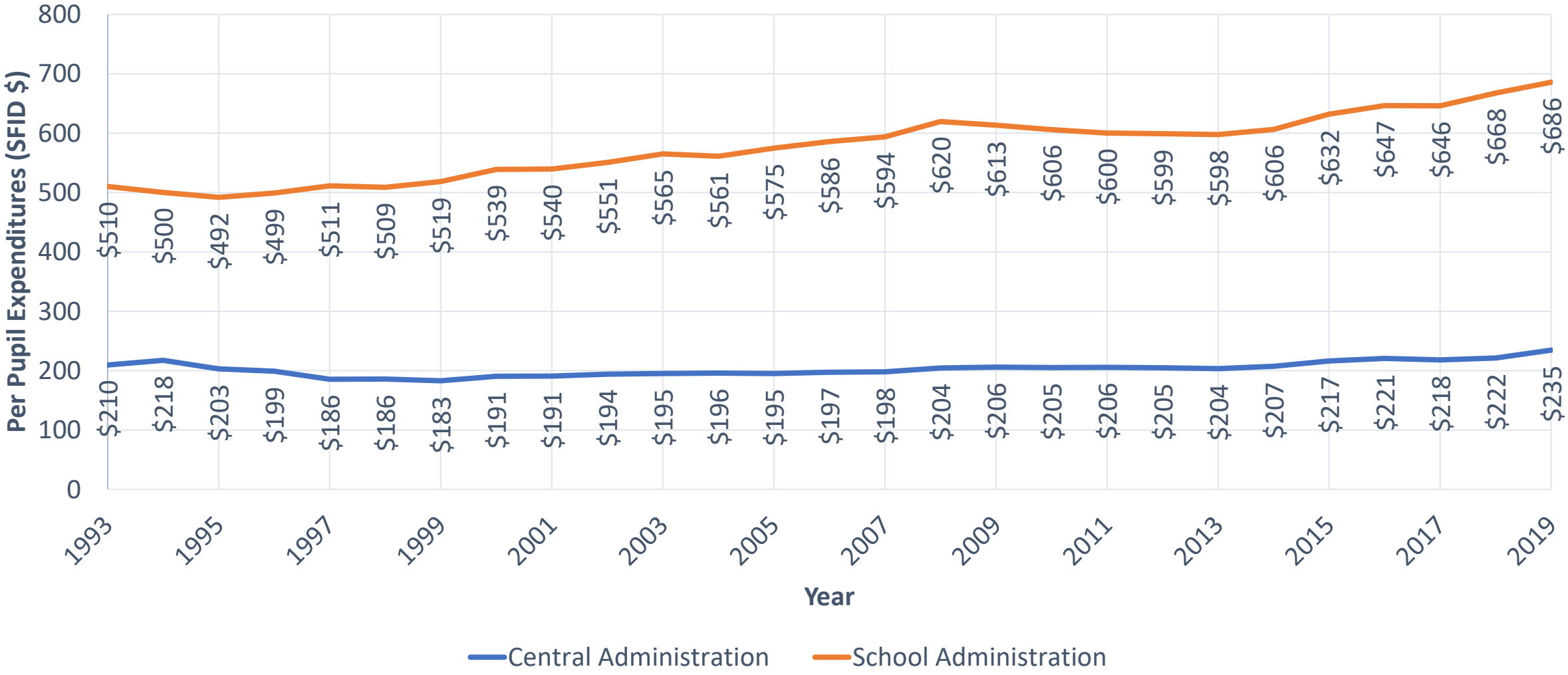


Notes: Figure shows regression-adjusted weekly wage penalties (or premiums): how much less (or more), in percentage terms, elementary, middle, and secondary public school teachers earn in weekly wages than their college-educated, nonteaching peers. Data points for 1994 and 1995 are unavailable and represented by dotted lines. See *Allegretto and Mishel 2019*, especially Appendix A, for more details.

Source: Authors' analysis of Current Population Survey Outgoing Rotation Group data accessed via the EPI Current Population Survey Extracts, Version 1.0.2 (EPI 2020).

Economic Policy Institute

District & School Administrative Expenditures
Adjusted for Competitive Wages over Time, Expressed in 2016$
National Average of All Districts, Weighted for Enrollment



Data Source: http://schoolfinancedata.org/wp-content/uploads/2019/03/DistrictIndicatorsDatabase_Stata_2019.zip

Wages & Benefits over Time (Constant 2016$)

Data Source: http://schoolfinancedata.org/wp-content/uploads/2019/03/DistrictIndicatorsDatabase_Stata_2019.zip

Evaluating State School Finance Systems

Indicators of School Funding Equity and Adequacy

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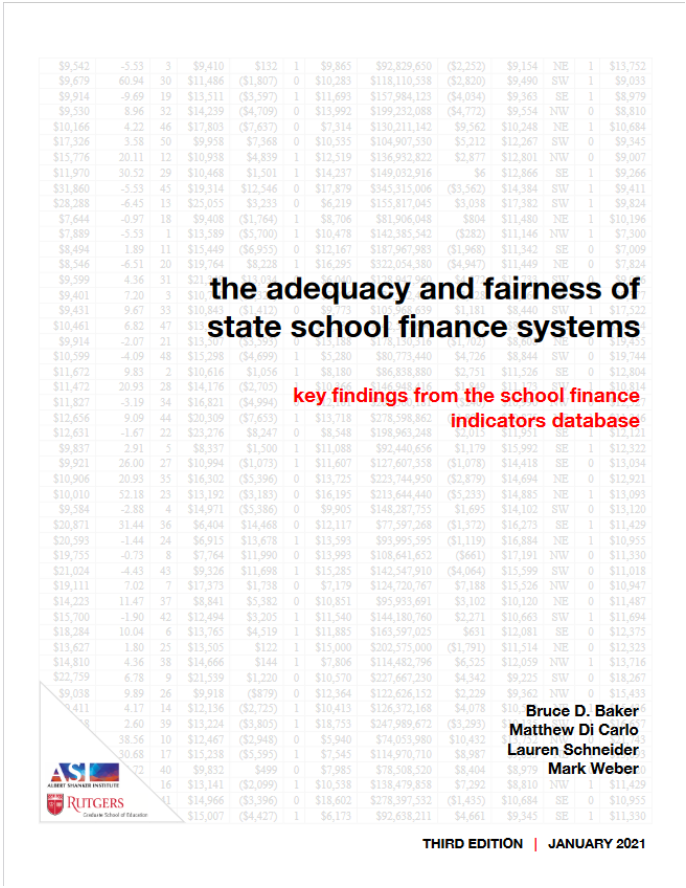
Goals of School Finance Systems

- The goal of state school finance systems is to provide all children, regardless of where they live or attend school, ***equal opportunity to achieve common, adequate outcome goals***
- Providing equal educational opportunity toward common goals costs different amounts in different settings, and across children (individually and collectively) by needs and contexts
  - State accountability systems (for whatever they're worth) set common goals… rate, rank and evaluate schools (and children) on whether they meet those goals
  - A fair system requires funding sufficient to provide equal opportunity to meet these goals (which are often used for articulating constitutional rights).

Indicators of State School Finance Systems

- **Educational Effort**
  - Education spending share of aggregate personal income
  - Education spending share of gross domestic product (state)
- Spending (revenue & key resource) Progressiveness
  - Ratio of resources (per pupil) available in higher versus lower poverty settings (basically a regression slope)
    - Descriptive regression model of “what is” (in terms of resource distribution)
    - Method can be used between and/or within districts
  - Per Pupil Spending, State & Local Revenue, Staffing Ratios
- **Relative Adequacy / Equal Opportunity**
  - Ratio of current spending to spending predicted to be needed (based on education cost model) to achieve national mean outcomes in reading and math.
    - By including outcome measures, allows estimation of “what should be” for comparison with “what is”



Modeling “progressivity” vs. “adequacy”

- **Progressivity**
  - Expenditure regression of “what is” in terms of current distribution of expenditures, with respect to “poverty” controlling for other factors that strongly influence expenditure variation:

Spending = f([Poverty, Disability, ELL][Scale, Sparsity][Input Prices])

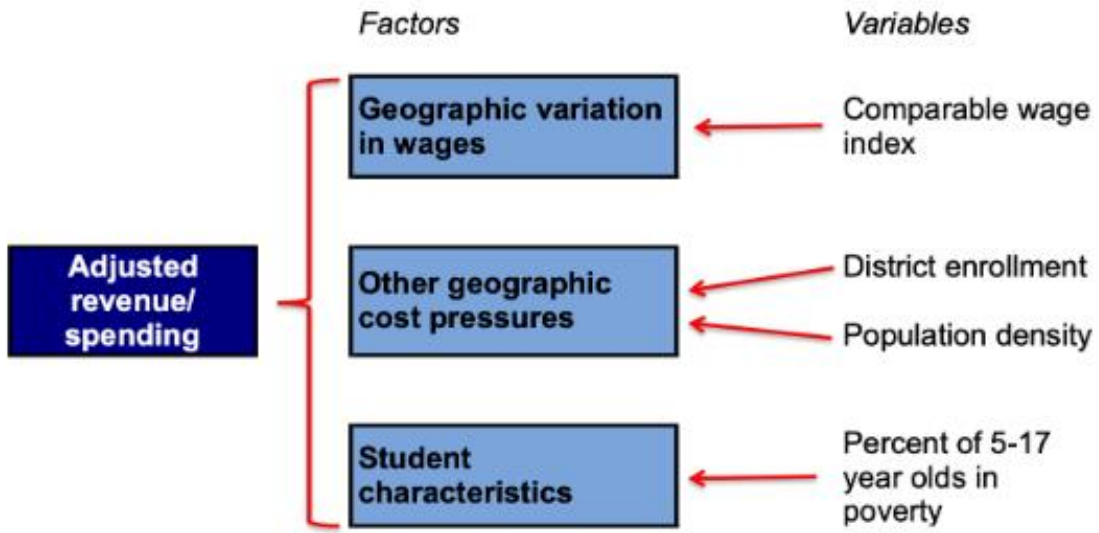
- **Equal Opportunity (& Adequacy)**
  - Expenditure regression (as “cost function”) holding “outcomes” constant, and controlling for factors that influence “efficiency” of spending
  - That is, what levels of spending are associated with achieving a given outcome target (“what should be”), given average efficiency characteristics, controlling for a variety of factors that influence costs

Spending = f(OUTCOMES [Poverty, Disability, ELL][Scale, Sparsity][Input Prices] INEFFICIENCY)

  - How does actual spending compare to these predictions for each district?

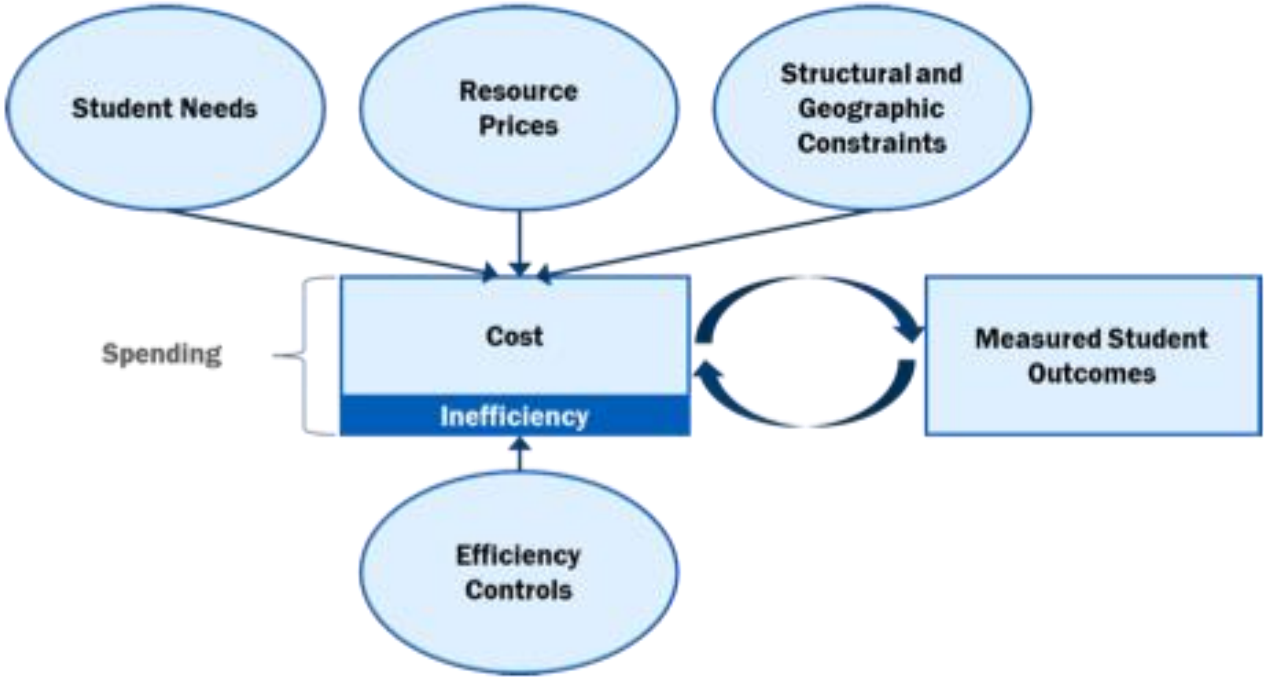
Modeling Differences in Spending & Cost

Progressiveness (What is?)
"Spending" Model



Q: How much does existing spending vary with respect to measures of need and cost?

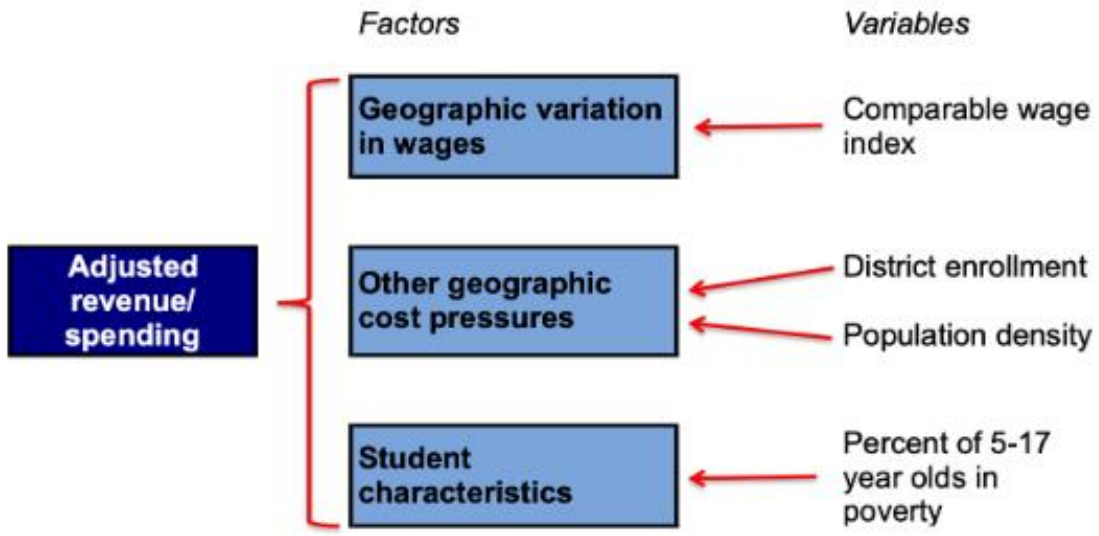
Predicted Cost (What should be?)
"Cost" Model



Q: How much does existing spending vary with respect to measures of need and cost, holding outcomes constant?

Modeling Differences in Spending & Cost

Progressiveness (What is?)
"Spending" Model



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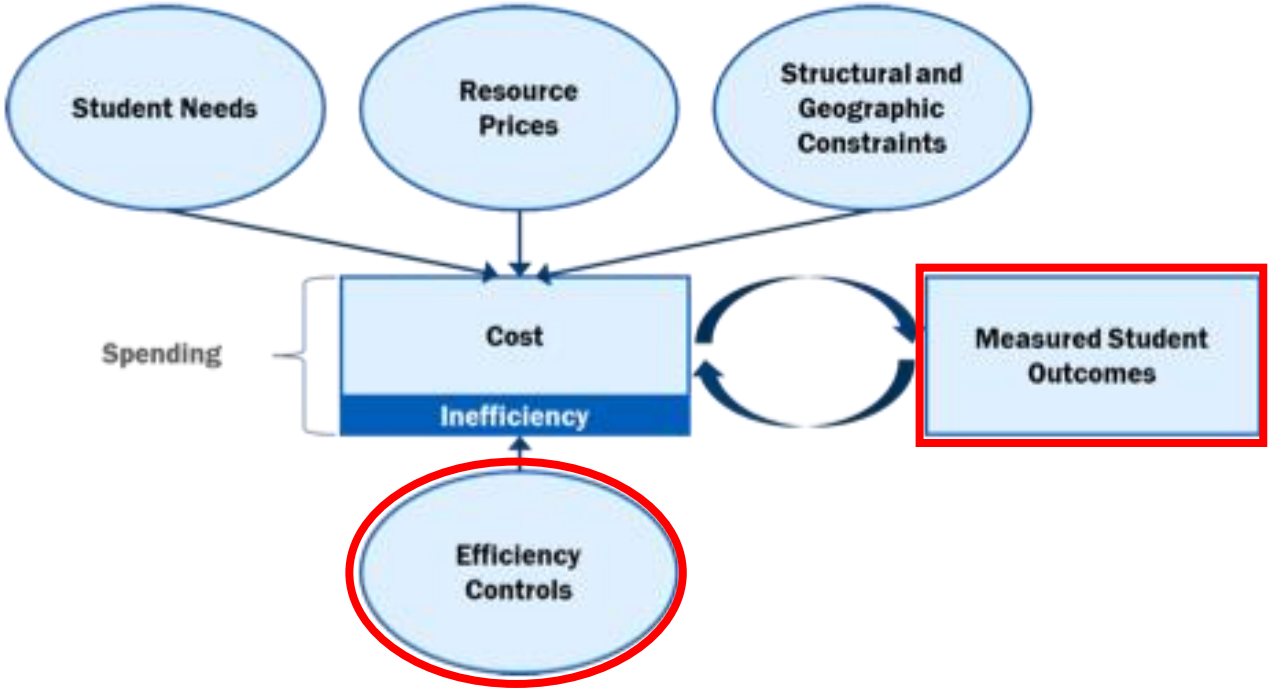

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Modeling Differences in Spending & Cost

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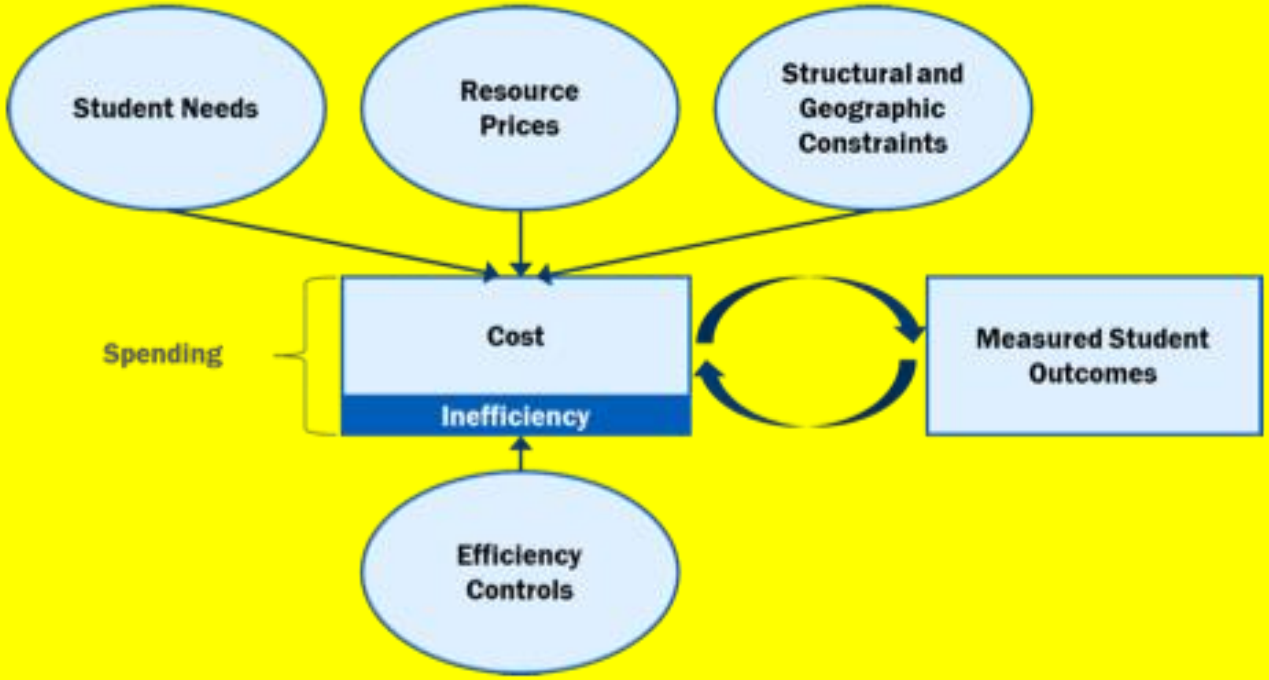
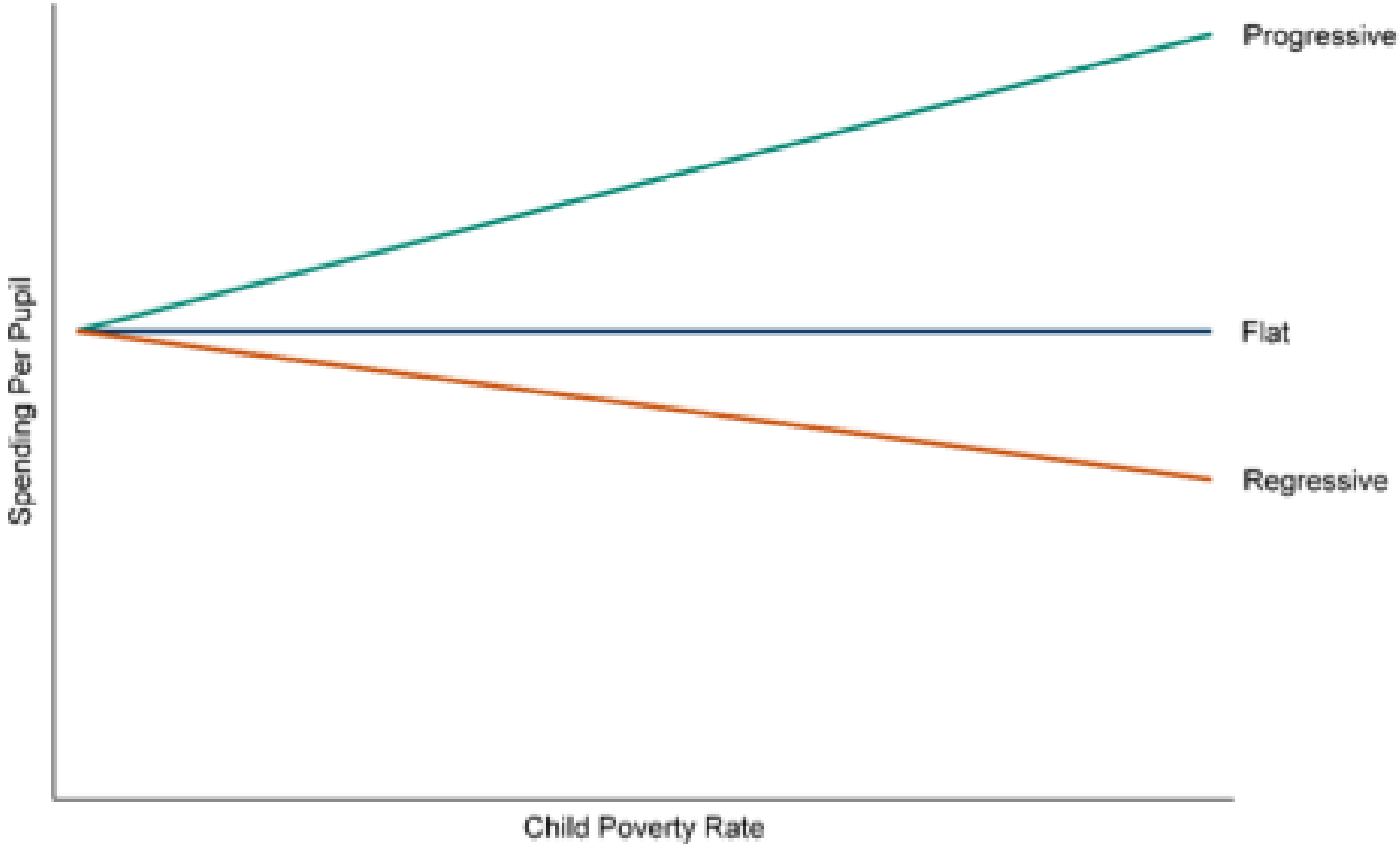


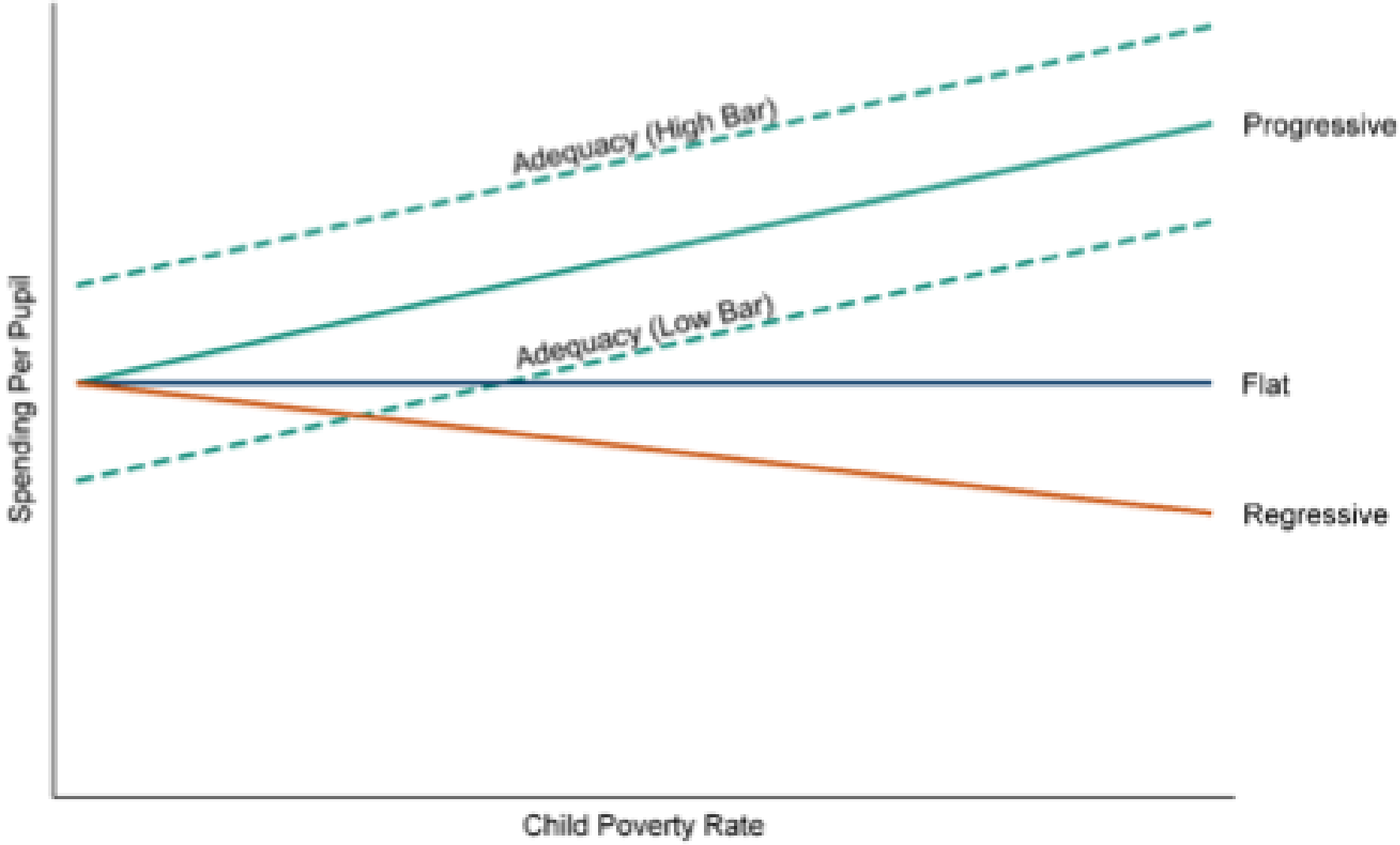
Q: How much spending is needed, controlling for need and cost factors (and inefficiency), to achieve specific outcome goals?

Progressiveness vs. Adequacy

(SFID, Urban Institute & Ed Trust)

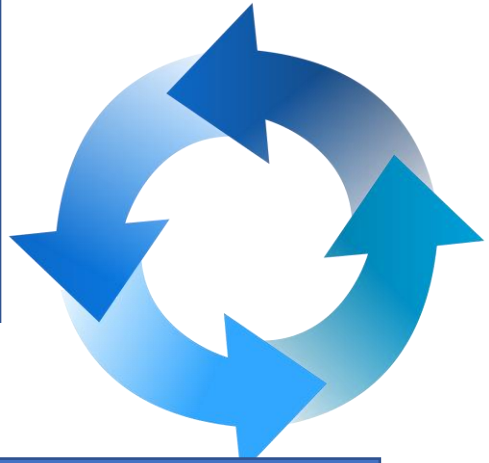


Progressiveness vs. Adequacy



Unifying concepts & methods

Conceptual Goal:
To provide, through school funding formulas, resources sufficient for all students to have ***equal opportunity*** to achieve *(constitutionally)* ***adequate outcomes***



Empirical Goal (requirements):
Methods used to guide policy, both setting of funding levels and cost differentials, must validly link spending requirements with outcome measures (& expectations).

Legal Causes of Action:

1. EP (State or Fed) exists where similarly situated individuals are differently treated.
   Treatment = Outcome Expectation(s)*
   (under which all are similarly situated)
2. "Adequacy" (state) requires linking spending levels to outcome expectations

**antiquated conceptions of "horizontal" and "vertical" equity undermine (negate) this argument!*

Selecting measures of “student needs” as “cost” factors

- We identify and select certain measures of student population characteristics because they are predictive of yielding lower outcomes on the measures of interest.*
  - The goal is to design a funding formula that supports equal opportunity to achieve common outcomes.
- It is important to identify that version of the measure that most accurately predicts – across the full range – variation outcomes.
  - Many ways to measure variations in shares of children from low income families across schools or districts. FRL in high poverty settings may not pick up variation well (if most/all schools are near or above 80%)
  - It’s not about making sure we measure each kid that qualifies or doesn’t but rather that we best capture the variation across schools & districts that is predictive of outcome variation.
- Then, use those same measures in cost modeling to predict cost variation
  - The goal is to leverage financial resources to mitigate the risk!
  - And when it comes to policy design, don’t mix and match weight recommendations and population measures.

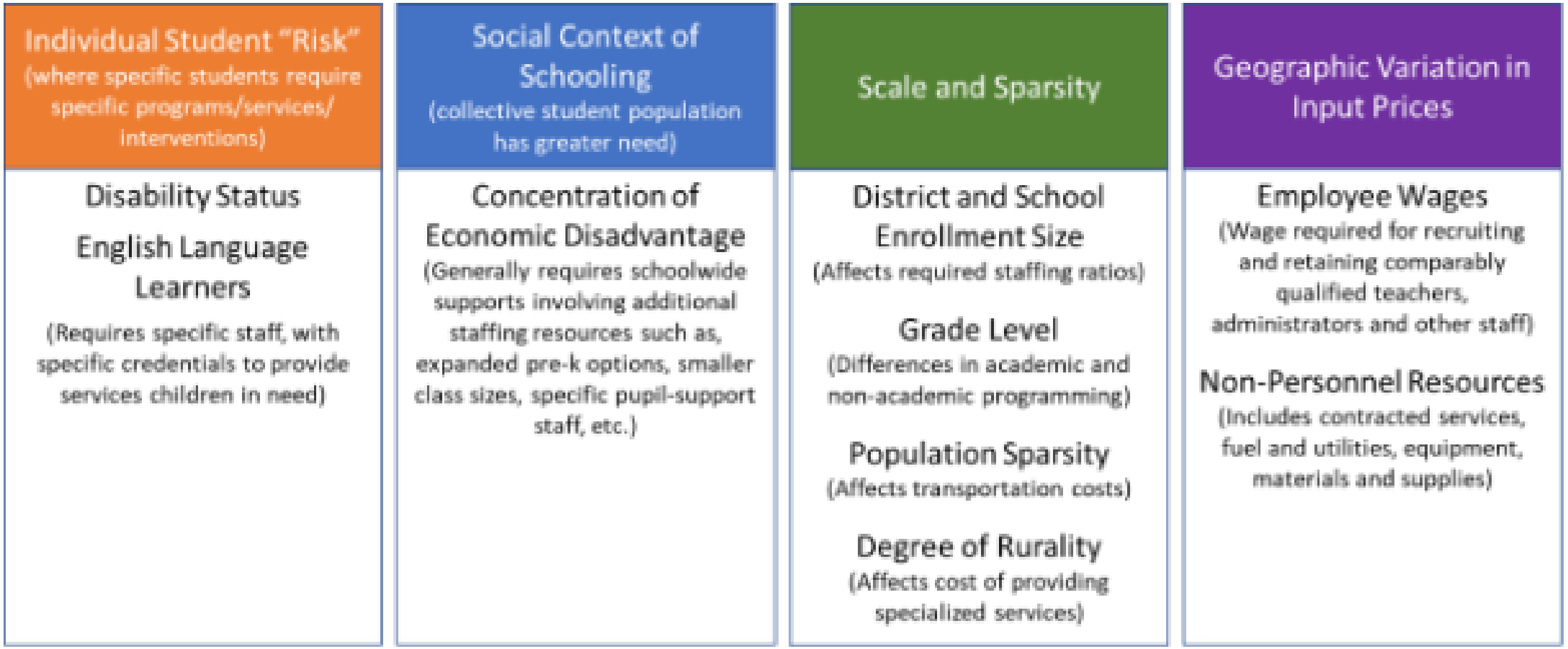
Risk Analysis

Cost Modeling

Formula Simulation

From related work in Vermont (2018)

Figure 2.1. Factors Affecting the Costs of Achieving Common Outcome Goals



Note. Cost is the spending required, less inefficiency, to achieve any specific set of outcome goals

https://legislature.vermont.gov/assets/Legislative-Reports/edu-legislative-report-pupil-weighting-factors-2019.pdf

Tech Tips

Standardizing Methods & Models for Evaluating Spending or Revenue Variation

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Use consistent approaches for inter & intra district spending modeling

- District Modeling
  - Spending = f(Poverty, ELL, Disability*, Grade Range Shares, Scale, Sparsity, Input Prices)
- School Level Modeling (if within district)
  - Spending = f(Poverty, ELL, Disability*, Grade Range Shares, ~~Scale, Sparsity, Input Prices)~~

*ideally broken out into a) high incidence/low cost & b) low incidence/high cost

Similar methods should be used for within & between district modeling

Across New York State Districts

DV = Current Spending per Pupil	Coef.	Std. Err.
Student Needs		
% Poverty (Census)	**-$11,783**	**$1,876**
% ELL	$8,938	$2,864
% Special Education	$16,365	$4,272
Competitive Wage Variation	$9,081	$987
Population Density	-$335	$131
<100	$21,779	$15,164
101 to 300	-$1,337	$5,284
201 to 600	$563	$4,626
601 to 1200	-$1,617	$1,989
1201 to 1500	-$418	$2,443
1501 to 2000	-$3,679	$1,946
Unified K-12 District	$368	$944
Interaction with Population Density		
<100	$1,620	$2,886
101 to 300	$3,044	$1,147
201 to 600	$742	$1,028
601 to 1200	$688	$378
1201 to 1500	$296	$424
1501 to 2000	$868	$317
Constant	$5,349	$1,445
R-squared = 0.4538		

Spending across districts is highly regressive with respect to child poverty rates!

Spending is not very predictable as a function of rational factors (or in the “right” direction)

Within New York City

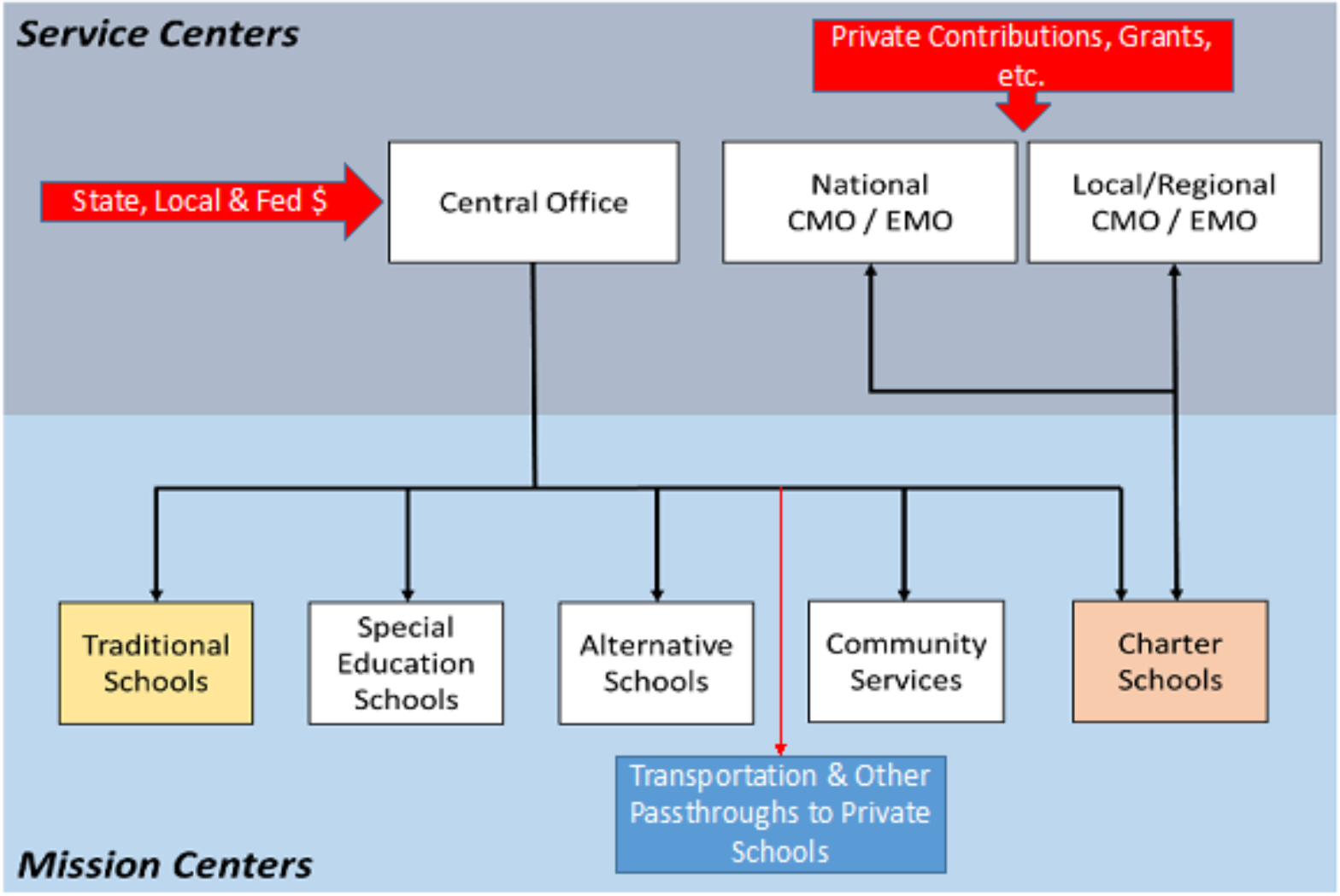
	Coef.(Difference)	Std. Err.
Grade Level		
% in Grades 6-8	-$779	$163
% in Grades 9-12	-$757	$142
Student Need		
% Subsidized Lunch	**$2,008**	**$297**
% Special Education	**$25,159**	**$1,174**
School Size (ln of Enrollment)	-$2,635	$85
Constant	$34,319	$653
Adj R-squared =		0.6148

Spending across schools is progressive with respect to low income shares!

Spending is predictable as a function of rational factors (and in the “right” direction)

In school level analysis, make sure to isolate comparable scope of services and match numerator (resources spent/allocated) and denominator (students served)

This is also an issue when calculating district resources!



Adapted from: Levin, J., Baker, B.D., Atchison, D., Brodziak, I., Boyle, A., Hall, A., Becker, J. (2017) Study of Funding Provided to Public Schools and Public Charter Schools in Maryland. Maryland Department of Education. http://marylandpublicschools.org/stateboard/Documents/01242017/TabG-CharterPublicSchoolFundingStudy.pdf

Incomplete Models/Analyses Produce Erroneous Results!

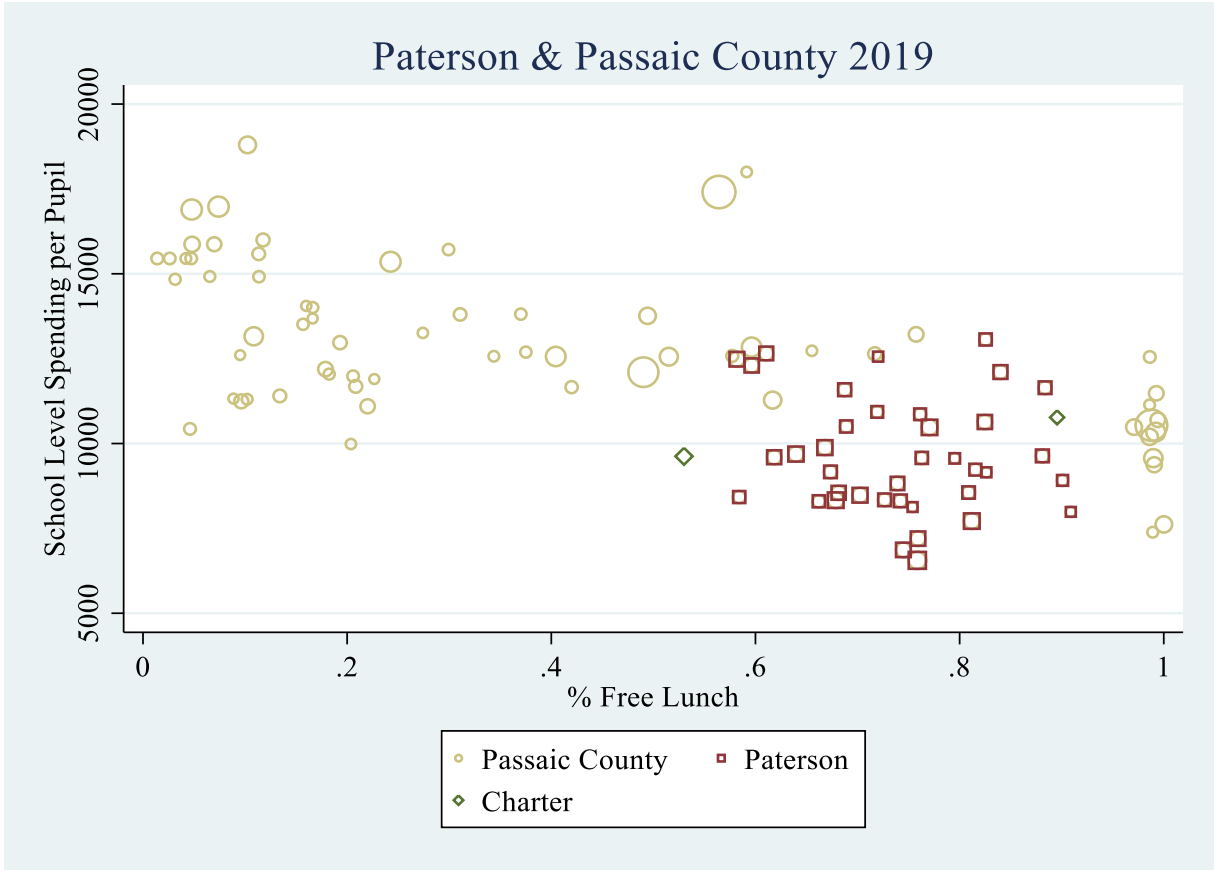
Modeling Baltimore City Schools "Progressivity" of per Pupil Spending 2013-2015

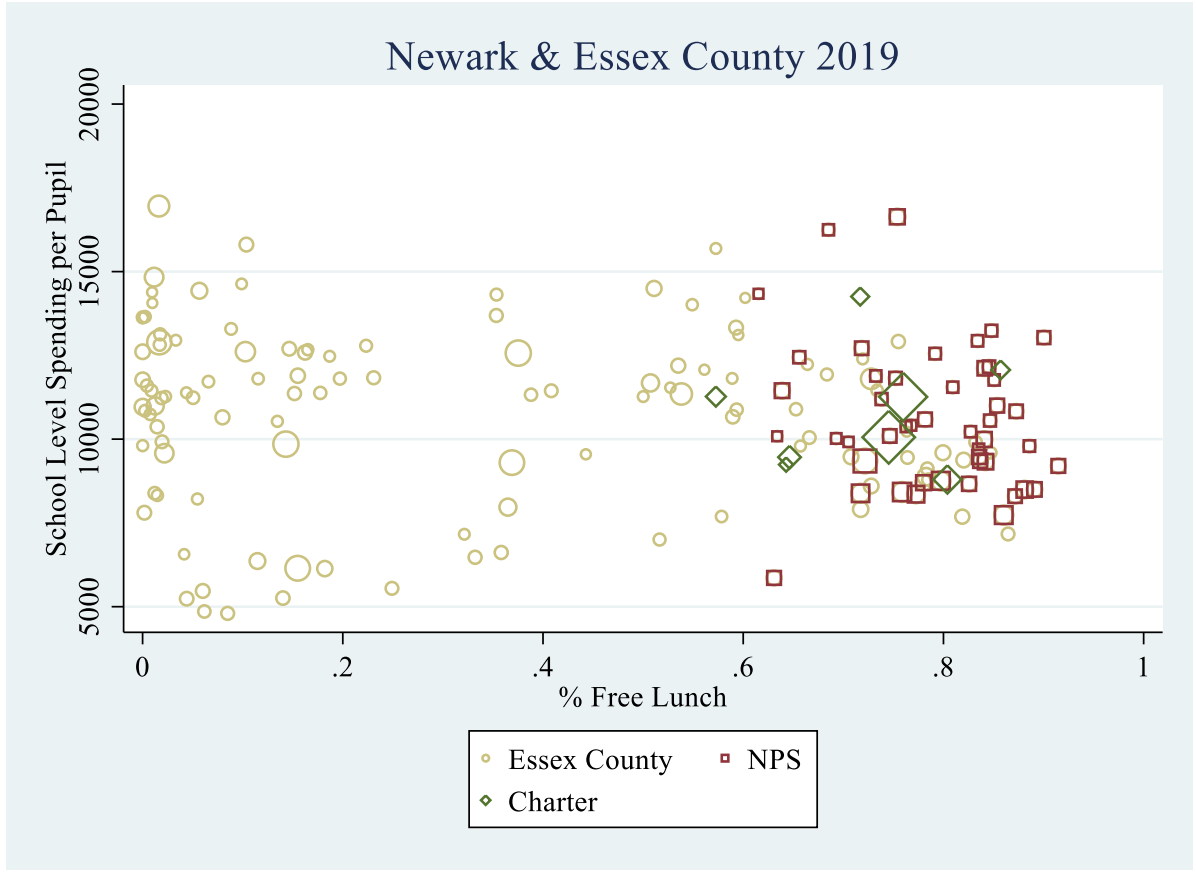
	Model 1		Model 2		Model 3		Model 4	
	coef	**se**	**coef**	**se**	**coef**	**se**	**coef**	**se**
Percent Low Income	**605.577**	739.951	**3,177.208*** **	675.869	**525.769**	626.455	**-79.205**	541.614
Year (2013 = Base)								
Year = 2014	178.255	252.892	190.666	219.900	228.875	190.868	480.605***	163.251
Year = 2015	178.309	255.645	245.487	222.364	288.304	193.030	506.272***	165.516
Grade Range Distribution								
% school enrollment in grades 6 to 8			2,379.914***	344.366	953.773***	318.295	409.458	275.518
% school enrollment in grades 9 to 12			3,472.449***	284.892	2,017.058***	271.230	1,798.147***	231.930
Other Student Characteristics								
Percent ESL					231.429	1,051.169	554.414	892.013
Percent Special Education					19,996.225***	1,553.121	18,665.847***	1,415.741
% Students with Disabilities that are Non-Severe Disabilities							-974.388	603.428
Intercept	12,487.185***	665.230	9,111.236***	634.154	8,707.116***	551.236	10,070.596***	765.302
Number of observations	520		520		520		514	
R2	0.003		0.249		0.437		0.486	

*note: *** p<0.01, ** p<0.05, * p<0.1*

Spend = f(% Low Income, %ELL, % SWD LI/HC, % SWD HI/LC, % Grades 6 to 8, % Grades 9 to 12, Geographic Location, Year, Control*)

	(1)
VARIABLES	Commensurate Expense per Pupil
charter	**630.360***
% school enrollment in grades 6 to 8	850.170*
% school enrollment in grades 9 to 12	558.609*
Percent Special Education	21,929.519*
% Students with Disabilities that are Non-Severe Disabilities	-1,212.161*
Percent ESL	358.567
Percent Low Income	1,515.191*
year = 2014	183.814*
year = 2015	263.468*
Constant	8,475.939*
Observations	3,966
R-squared	0.504
Robust standard errors in parentheses	
* p<0.05	


Paterson & Passaic County 2019
School Level Spending per Pupil
5000
10000
15000
20000
0
.2
.4
.6
.8
1
% Free Lunch
Passaic County
Paterson
Charter


Newark & Essex County 2019
School Level Spending per Pupil
5000
10000
15000
20000
0
.2
.4
.6
.8
1
% Free Lunch
Essex County
NPS
Charter

Tech Tips

Calculating Revenue per Pupil with F-33 Data

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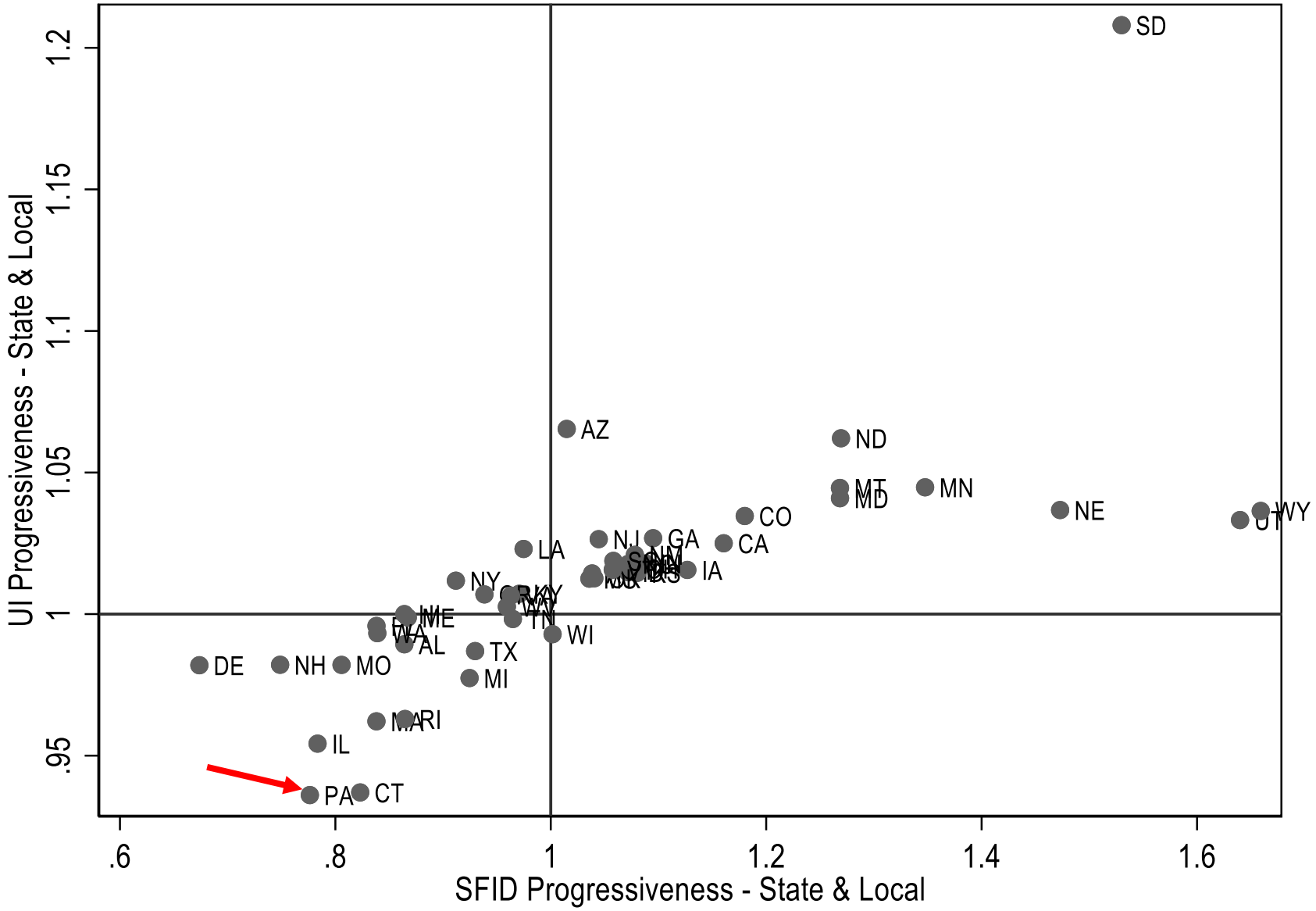
F-33 Quick (least bad) Fix

- gen totrevpp=((tfedrev_f33full+tstrev_f33full+ tlocrev_f33full+ b10_f33full+ b12_f33full- q11_f33full - v91_f33full - v92_f33full)*1000)/ member_ccdpsu
  - b10 = Direct federal revenue - Impact aid (P.L. 81-815 and 81-874)
  - b12 = Direct federal revenue - Native American (Indian) education
  - q11 = payments to other school systems
  - v91 = payments to private schools
  - v92 = payments to charter schools
  - Denominator = summed district school pupils (from public school universe data)
- gen tstrev_pp=pctstot_f33red/100*totrevpp
- gen tlocrev_pp=pctltot_f33red/100*totrevpp



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State Effort & Education Spending

Findings from Ongoing Work

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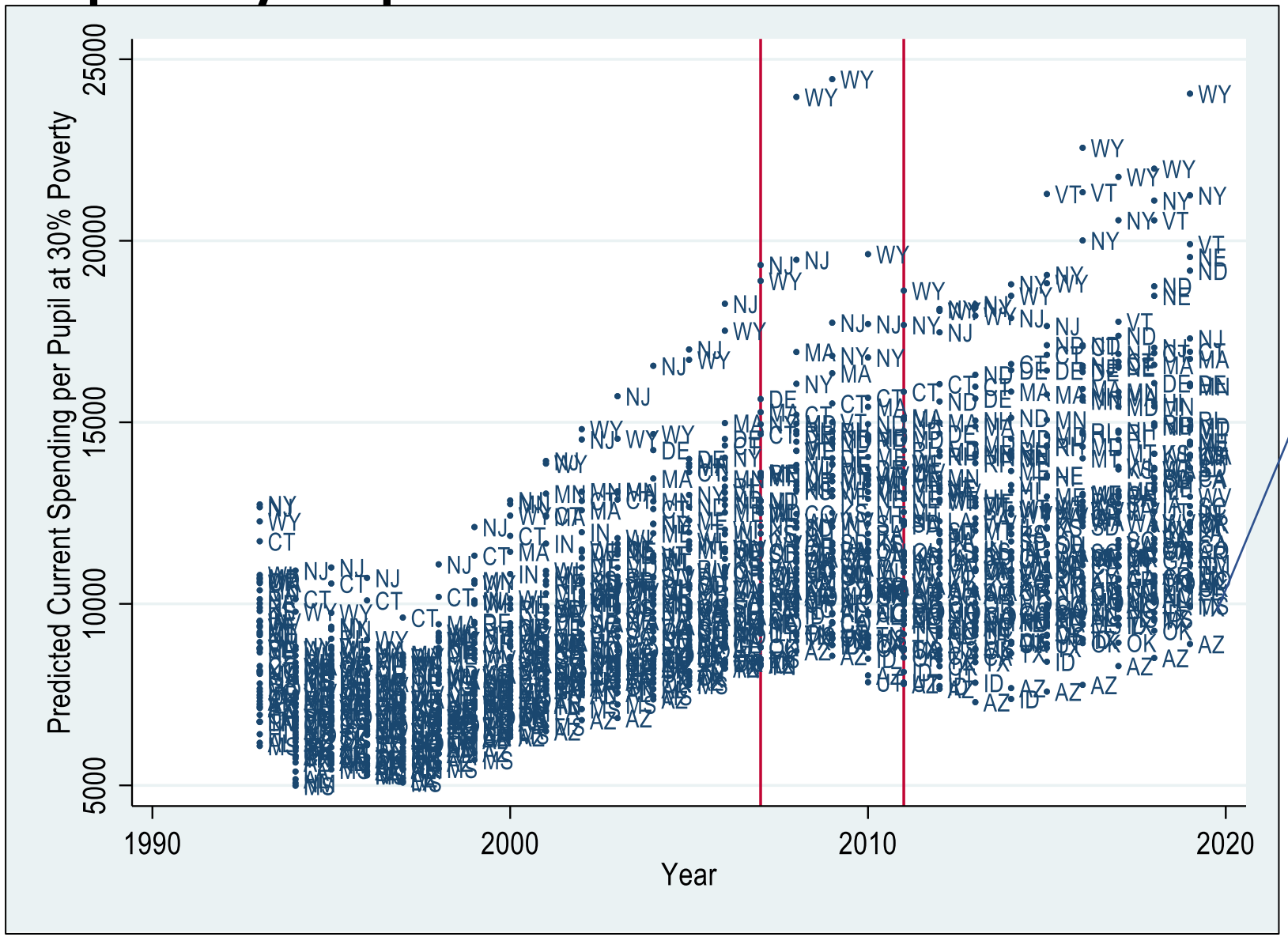
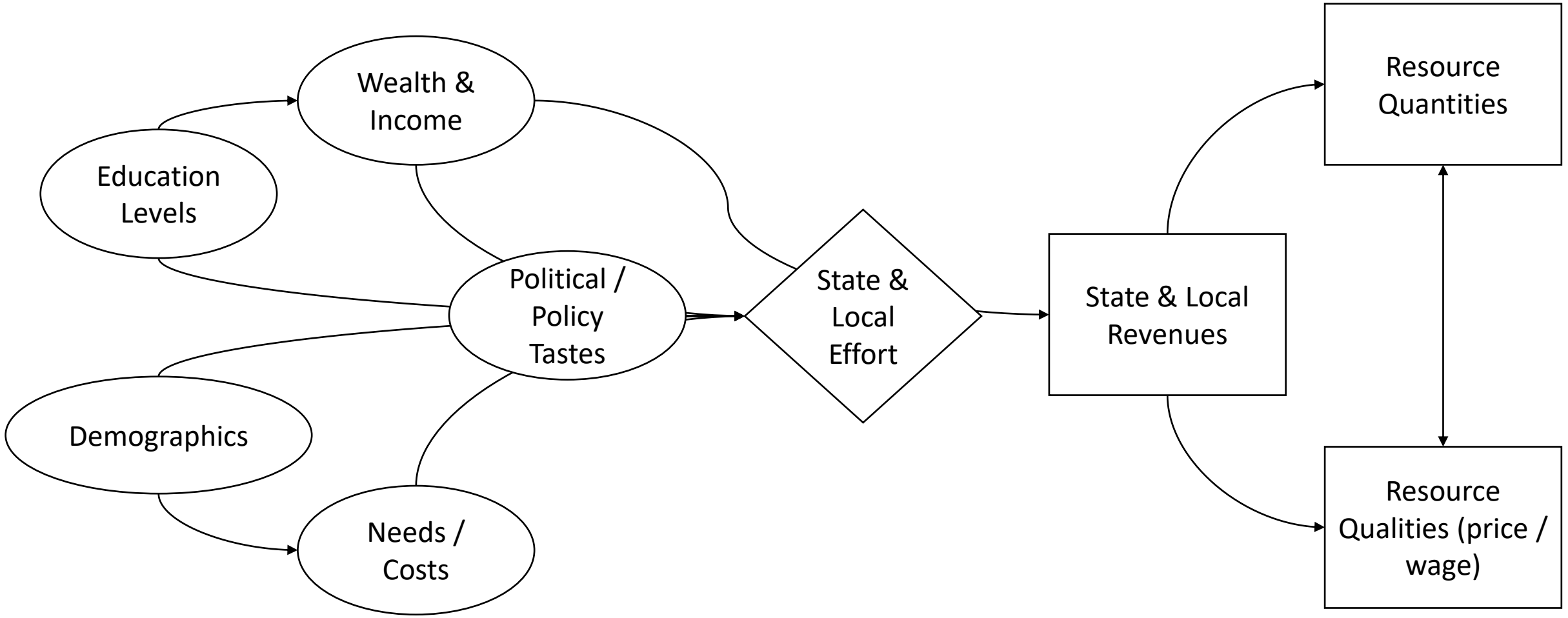
The Collapse of Effort & the Great Recession

Race to the bottom among Arizona, Florida, North Carolina and Tennessee

Inequality Explosion & the Great Recession



Race to the bottom among Arizona and Oklahoma


Wealth & Income
Education Levels
Political / Policy Tastes
Demographics
Needs / Costs
State & Local Effort
State & Local Revenues
Resource Quantities
Resource Qualities (price / wage)

What predicts effort?

VARIABLES	Between Ratio of Total State & Local Education Expenditure to Gross State Product	Within Ratio of Total State & Local Education Expenditure to Gross State Product	Between State & Local Revenue as % of Personal Income	Within State & Local Revenue as % of Personal Income
% 6 to 16 Enrolled in Public School	-0.021	**0.017***	-0.026	**0.030***
Income Ratio Public to Non-Public Enrolled	**0.035***	-0.002	**0.036***	-0.002
Statewide Share Enrolled in Charter Schools	-0.057	**-0.015***	-0.037	**-0.031***
Household Income [ln]	-0.022	**-0.009***	-0.004	**-0.006***
Housing Value [ln]	-0.006	**0.005***	-0.011	**0.009***
Income Ratio Under/Over 130 Poverty Income	-0.132*	-0.007	-0.082	-0.009
Ratio of Black/Brown Youth Share to White Adult Share of Population	0.006	**-0.007***	0.008	**-0.008***
Policy Liberalism Index - Median	**0.003***	**0.003***	**0.003***	**0.003***
Year		0.000		-0.000*
Constant	0.385*	0.036	0.235	0.523*
Observations	960	960	960	960
R-squared	0.476	0.224	0.422	0.425
Number of statefip	48	48	48	48

Standard errors in parentheses

* p<0.05

1. As states increase shares of children in charter schools, they reduce effort to fund schools more generally
2. **As the student population becomes more black & brown, white adults reduce their effort to fund schools**
3. More liberal states apply higher effort, and as states become more liberal, they increase their effort.

Adequacy and Outcomes

Findings from Ongoing Work

RESEARCH BRIEF

THE ADEQUACY OF SCHOOL DISTRICT SPENDING IN THE U.S.

Bruce D. Baker
Matthew Di Carlo
Mark Weber

March 2021

ABSTRACT

We present an overview of spending adequacy among individual K-12 school districts in the U.S. Our results are from a new database of over 12,000 public school districts that allows users to compare each district's actual per-pupil spending levels to estimates of adequate spending levels—i.e., spending required to achieve the common goal of national average math and reading scores. The data are for the 2017-18 school year. Predictably, we find substantial heterogeneity, with many districts spending well above our estimated adequacy targets and many others spending well below, in some cases shockingly below. Districts with negative (i.e., inadequate) funding gaps are especially prevalent in the southeast and southwest, but they are also found throughout the entire U.S., including in states, such as Massachusetts and Connecticut, which include generally high-spending districts. The sum of these negative gaps across all districts (ignoring districts with positive gaps) is $104 billion, and the average negative gap is $4,254 per-pupil. Conversely, even in states where underfunding is widespread and typically severe, there are numerous districts in which resources exceed our adequate spending estimates. Finally, we show that the extent of funding inadequacy increases with district child poverty rates and with the proportion of Black and especially Hispanic (Latinx) students served by districts. These results illustrate that most states are failing in their job of filling the holes between districts' costs and their capacity to pay those costs, as well as how, even in states that are more successful, many districts slip through the cracks. An effort to rectify these discrepancies could consist of a strategic expansion of the federal role in education finance, as well as a recalibration of how states fund their schools. High-quality district adequacy measures can help guide this process by identifying where resources are needed most.

SCHOOL FINANCE INDICATORS DATABASE

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Research Brief 02-2021 www.schoolfinancedata.org

Journal of Education Finance

VOLUME 47 NUMBER 1 SUMMER 2021

Informing Federal School Finance Policy with Empirical Evidence
Bruce D. Baker, Mark Weber, and Ajay Srikanth

An Examination of the Relationship between Capital Outlay Inequalities and Cost-Cutting General Funding Measures During the Great Recession
Jeffrey Maiden, H. Michael Crowson, and Tammie Reynolds

Understanding the External Social Benefits of Education in Ethiopia: A Contextual Analysis Using Young Lives
Ricardo Sabates, Yiran Vicky Zhao, Rafael Mitchell, and Sonia Ilie

Addressing the Gender Pay Gap: The Influence of Female and Male Dominant Disciplines in Gender Pay Equity
David G. Buckman and Tommy E. Jackson

Generating Stable University Funding Mechanisms: Income Contingent Loan Structure Choice within the Irish Education System
Charles Larkin and Shaen Corbet

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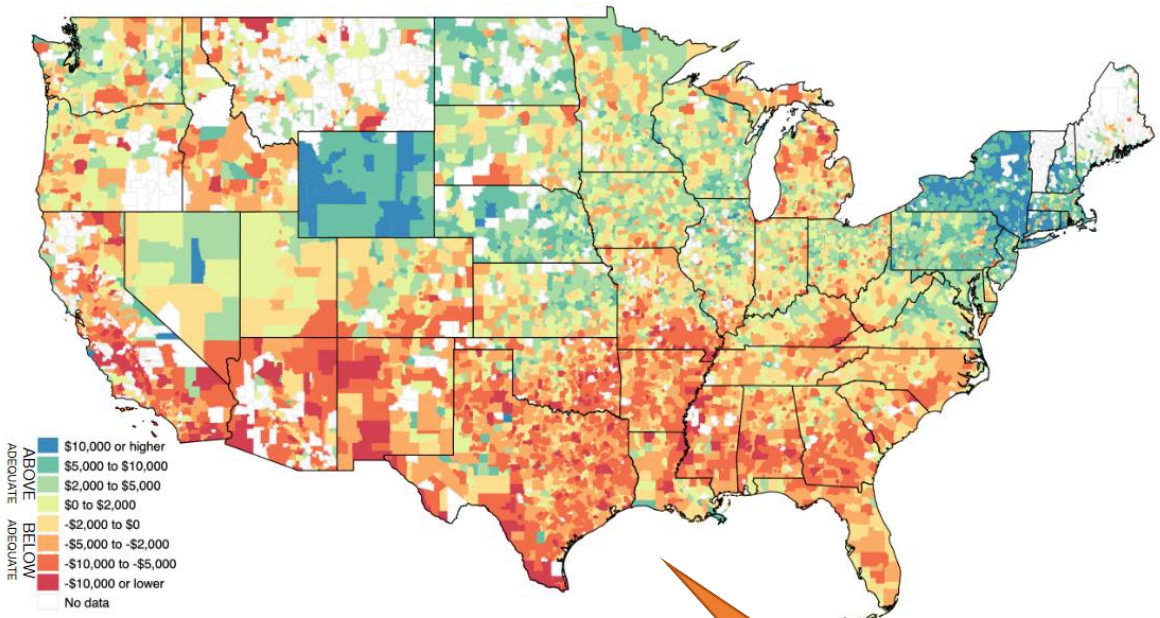
Funding Gaps (SFID) & Outcome Gaps (SEDA)

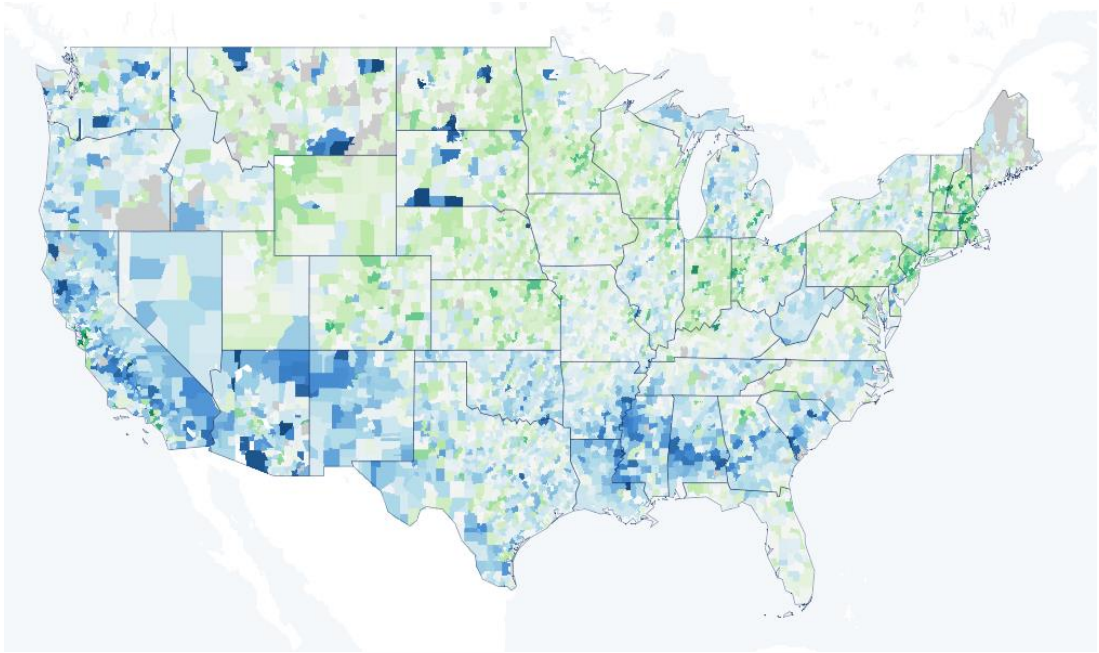
figure 1 **Map of district funding gaps**

Gap between actual and estimated adequate spending per-pupil, 2018

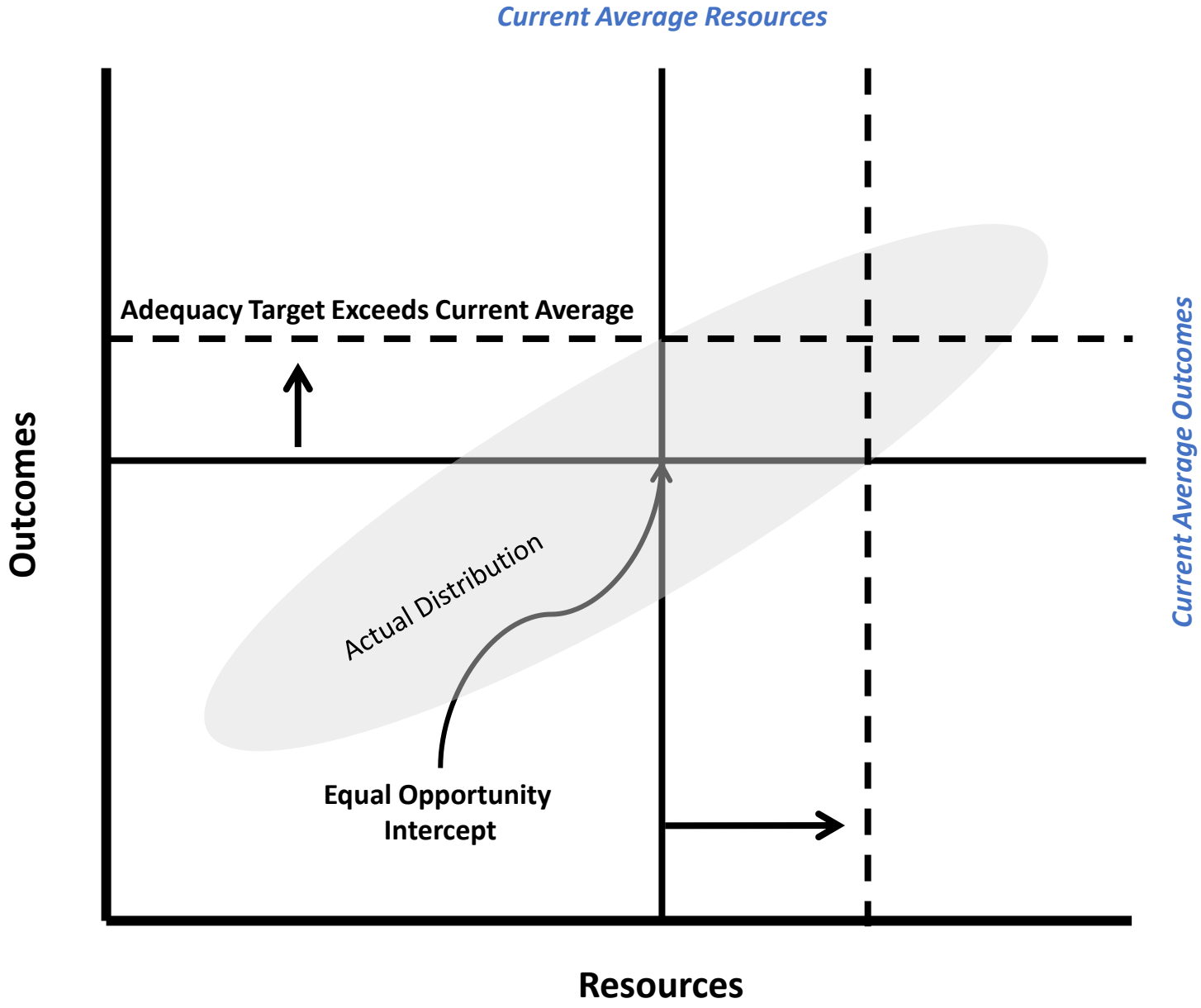


Educational Opportunity In The U.S.

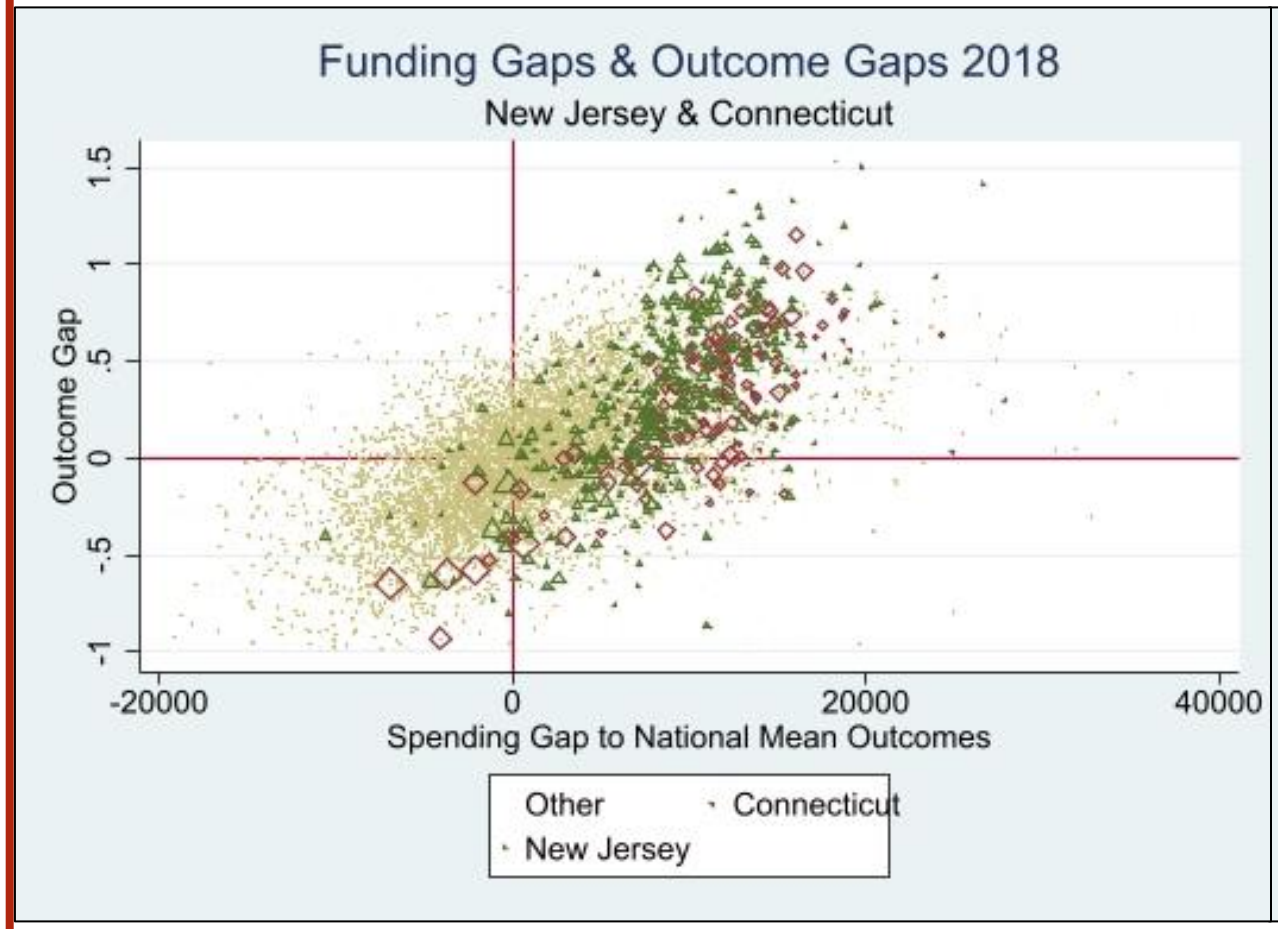
shown by **average test scores** for **all students** by **school district**

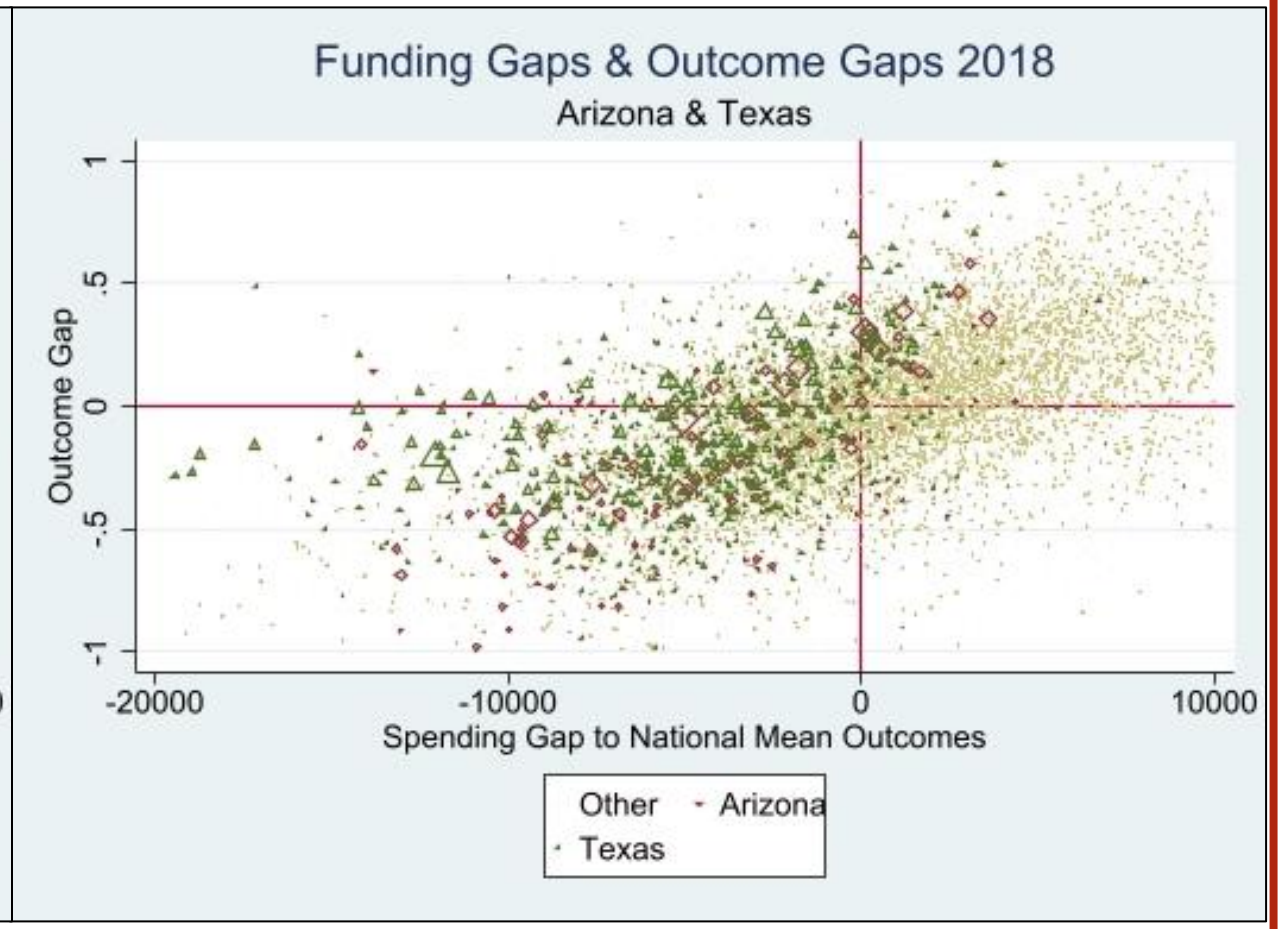


Filling the RED gaps in 2021 = $130b


Current Average Resources
Adequacy Target Exceeds Current Average
Outcomes
Actual Distribution
Equal Opportunity
Intercept
Current Average Outcomes
Resources

Adequacy and Outcomes

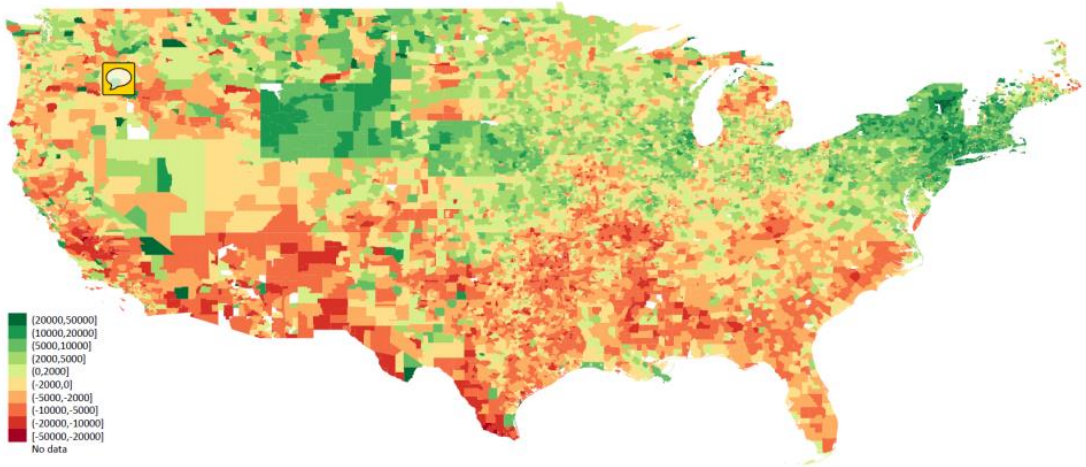




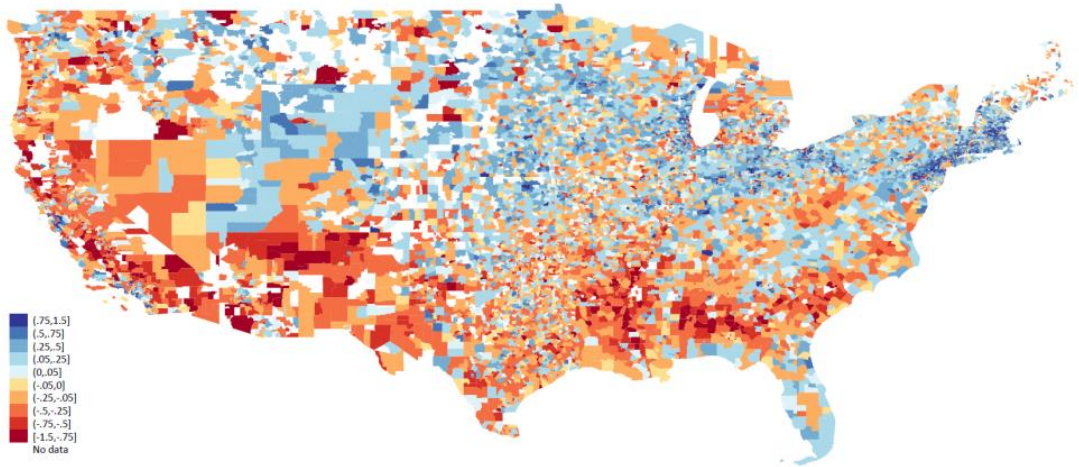
Also – it costs more to achieve higher outcomes!

Cost gaps to National Average Outcomes

2019
Standard 1

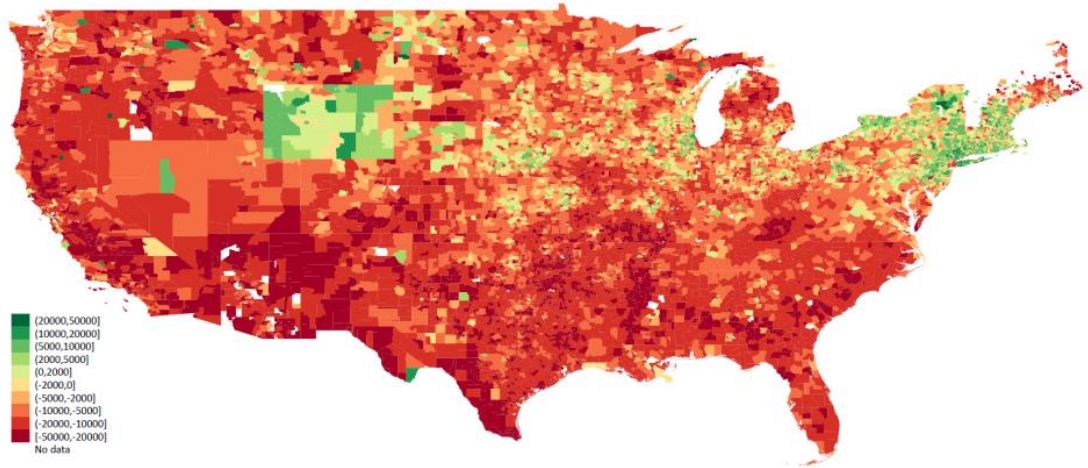


Outcome Gaps 2018
Standard 1

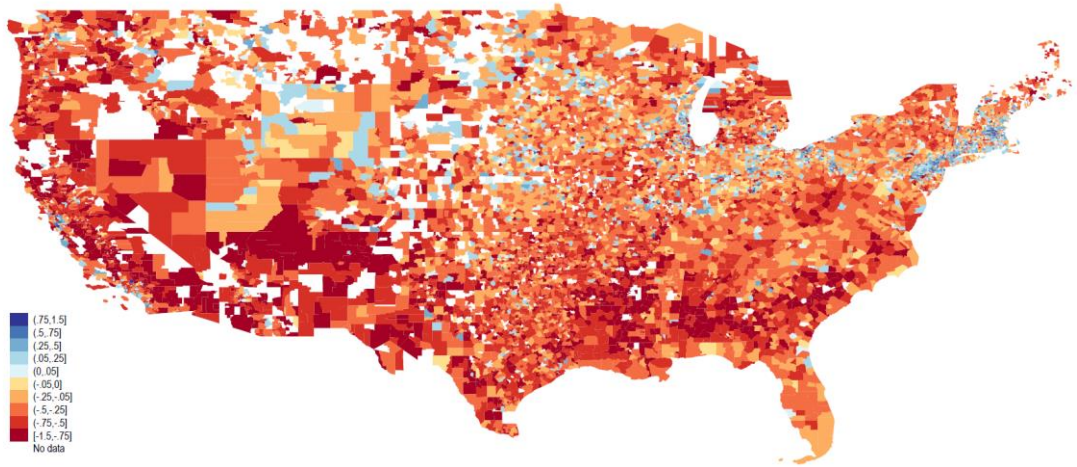


Cost gaps to Massachusetts Average Outcomes

2019
Standard 3



Outcome Gaps 2018
Standard 3



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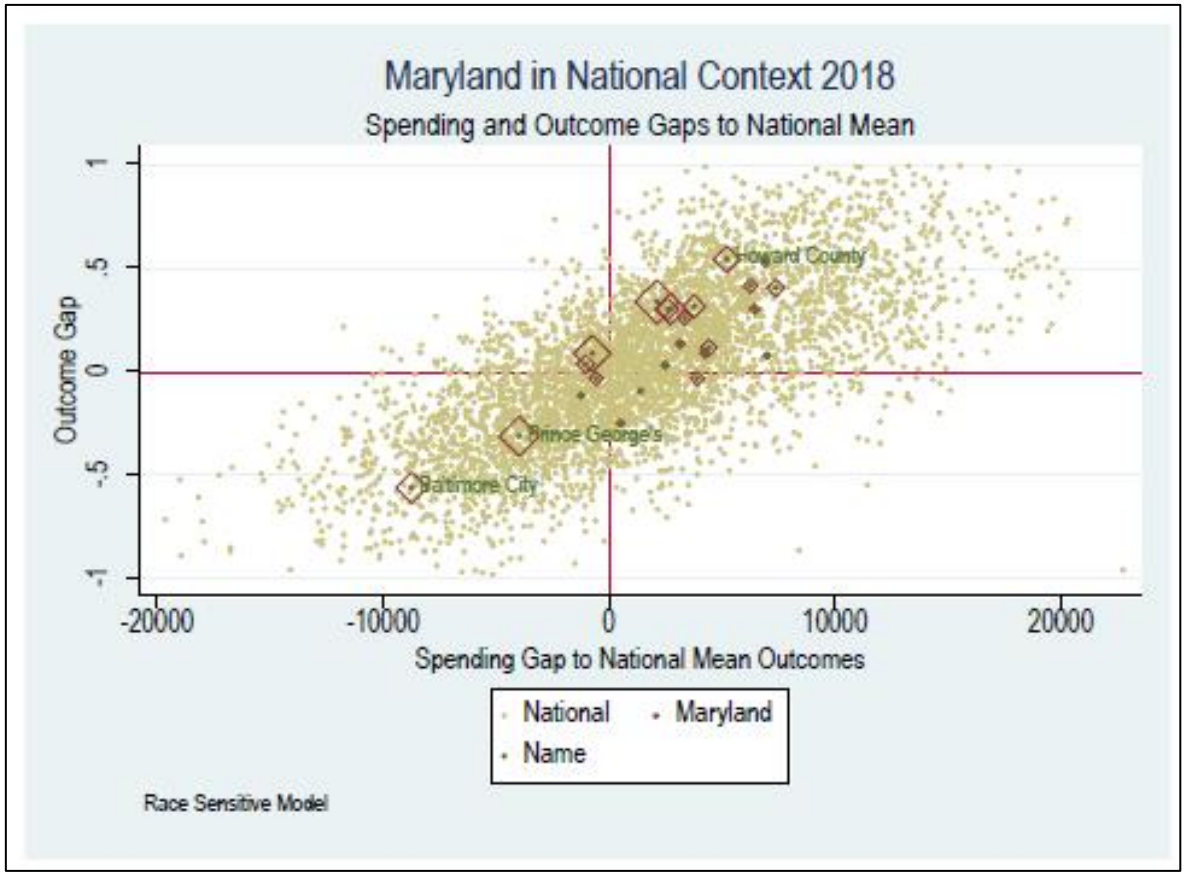
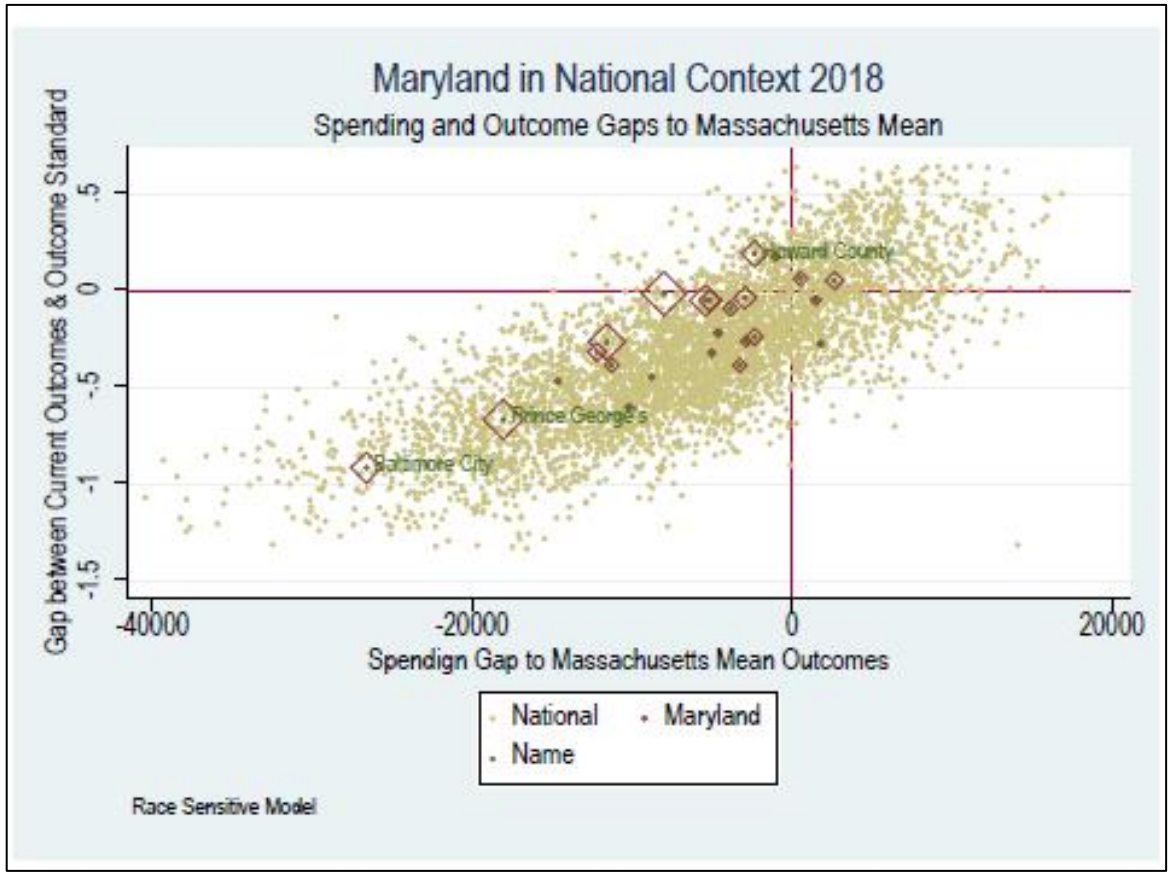
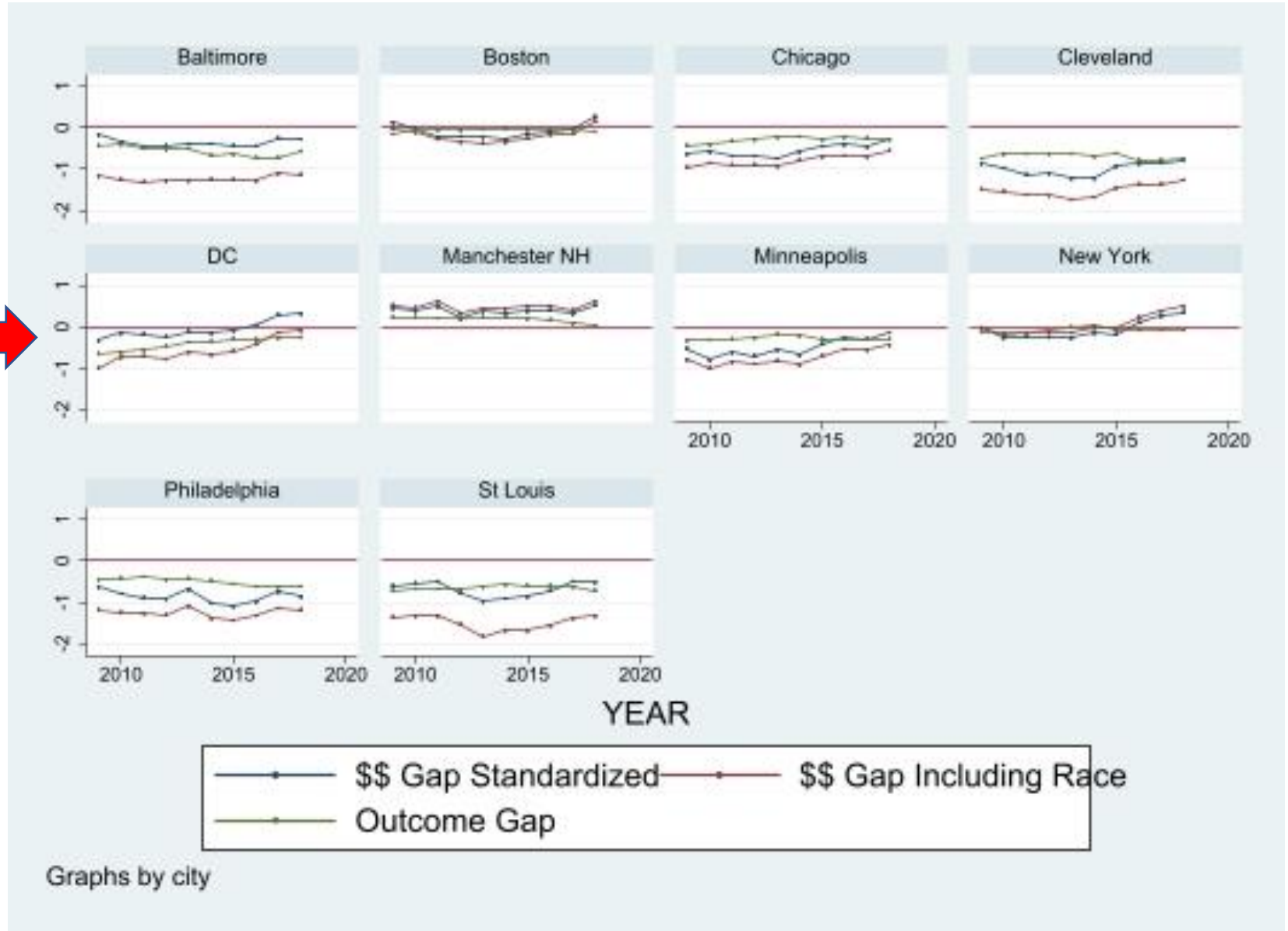
Also – it costs more to achieve higher outcomes!

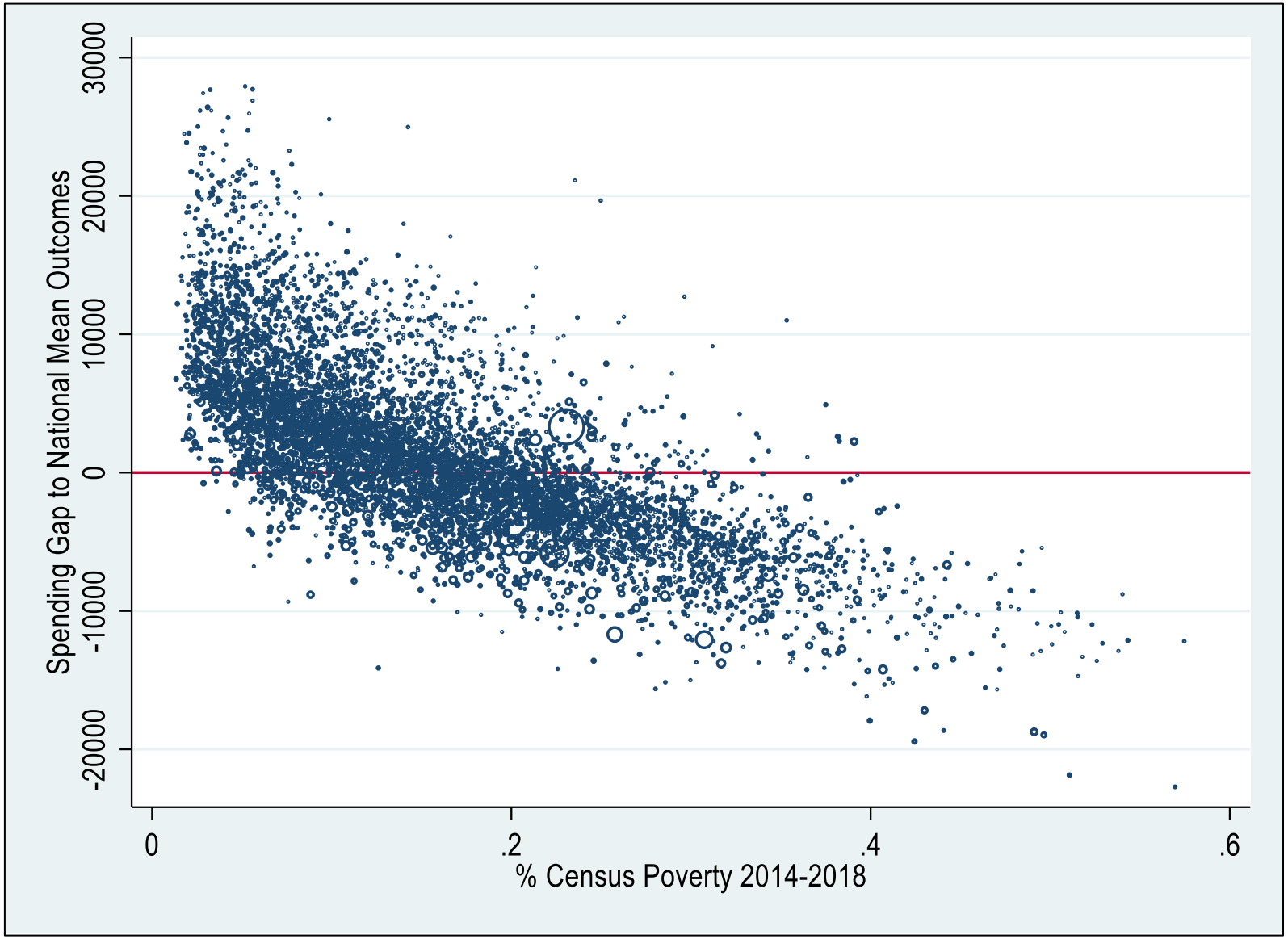




Adequacy and Outcomes in Select Cities



Adequacy and Poverty



Effort and Adequacy (High Poverty Districts)

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What Predicts "Adequacy" for the Highest Poverty Quintile?

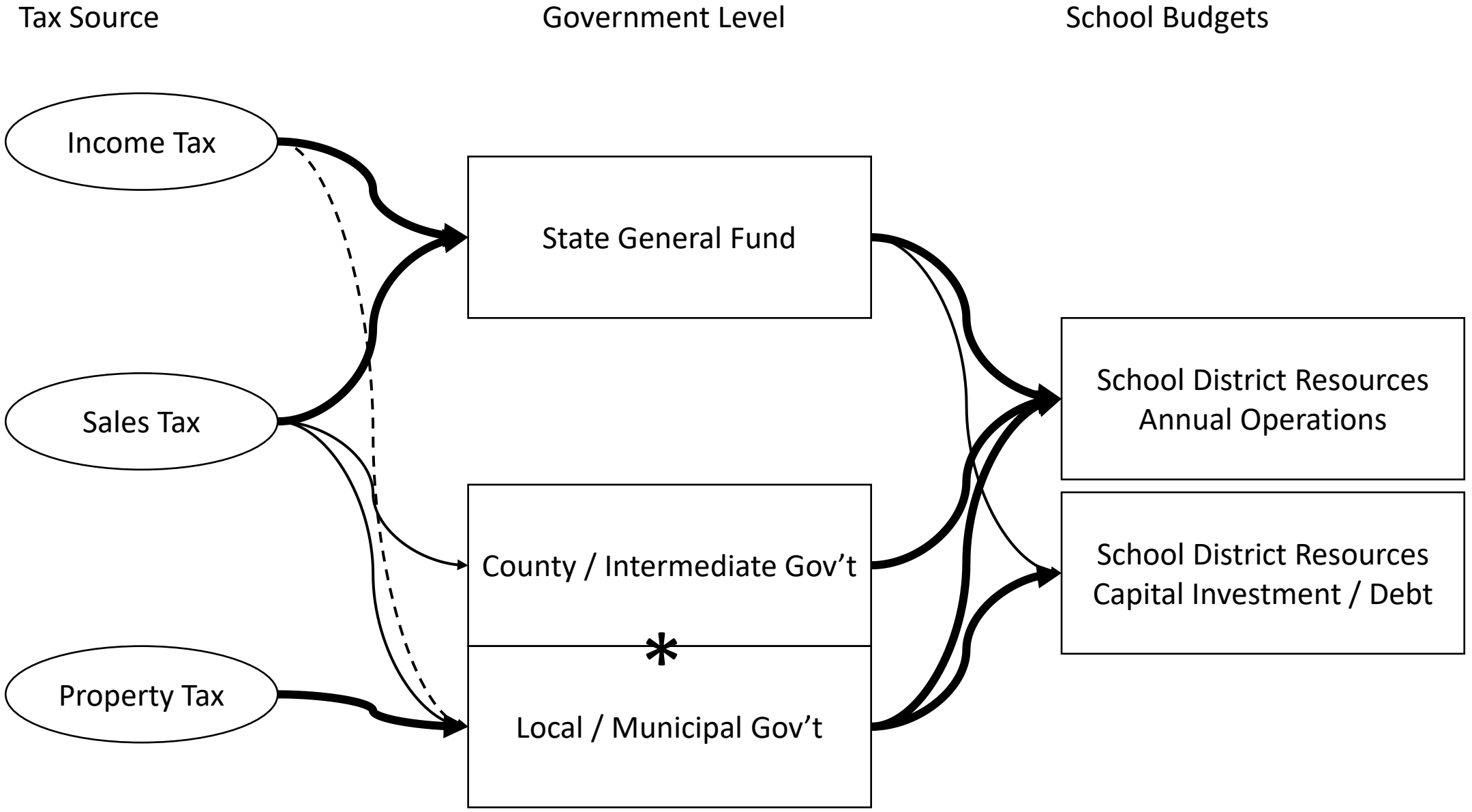
	Between	Within	Between	Within
VARIABLES	Current $ as % of Adequate $-Higest Poverty Quintile	Current $ as % of Adequate $-Higest Poverty Quintile	Current $ as % of Adequate $-Higest Poverty Quintile	Current $ as % of Adequate $-Highest Poverty Quintile
Ratio of Total State & Local Education Expenditure to Gross State Product	**18.892***	**2.967***		
% School Revenue from Federal Sources	-0.044	**0.005***	-0.036	**0.005***
% of School Revenue from State Sources	***-0.004***	***0.001***	***-0.003***	***0.002***
Effective Property Tax Rate	2.462	-0.062	5.076	-0.110
Property Taxes as % of HH Income	-0.199	-0.004	-0.214	-0.004
Household Income [ln]	0.493	**0.572***	0.071	**0.541***
Housing Value [ln]	0.087	**0.220***	0.174	**0.205***
Income Ratio Under/Over 130 Poverty Income	4.190	0.321	2.463	0.300
% 6 to 16 Enrolled in Public School	0.480	-0.171	0.429	-0.249
Income Ratio Public to Non-Public Enrolled	0.361	0.034	0.556	0.034
Statewide Share Enrolled in Charter Schools	**-2.070***	**0.514***	**-2.272***	**0.618***
Elementary & Secondary Educ Spending as % of State Revenue	-2.555	**0.659***	-2.054	**0.527***
Year		-0.021*		-0.018*
State & Local Revenue as % of Personal Income			**17.586***	**4.248***
Constant	-6.865	32.641*	-3.146	28.636*
Observations	470	470	470	470
R-squared	0.700	0.321	0.706	0.332
Number of statefip	47	47	47	47

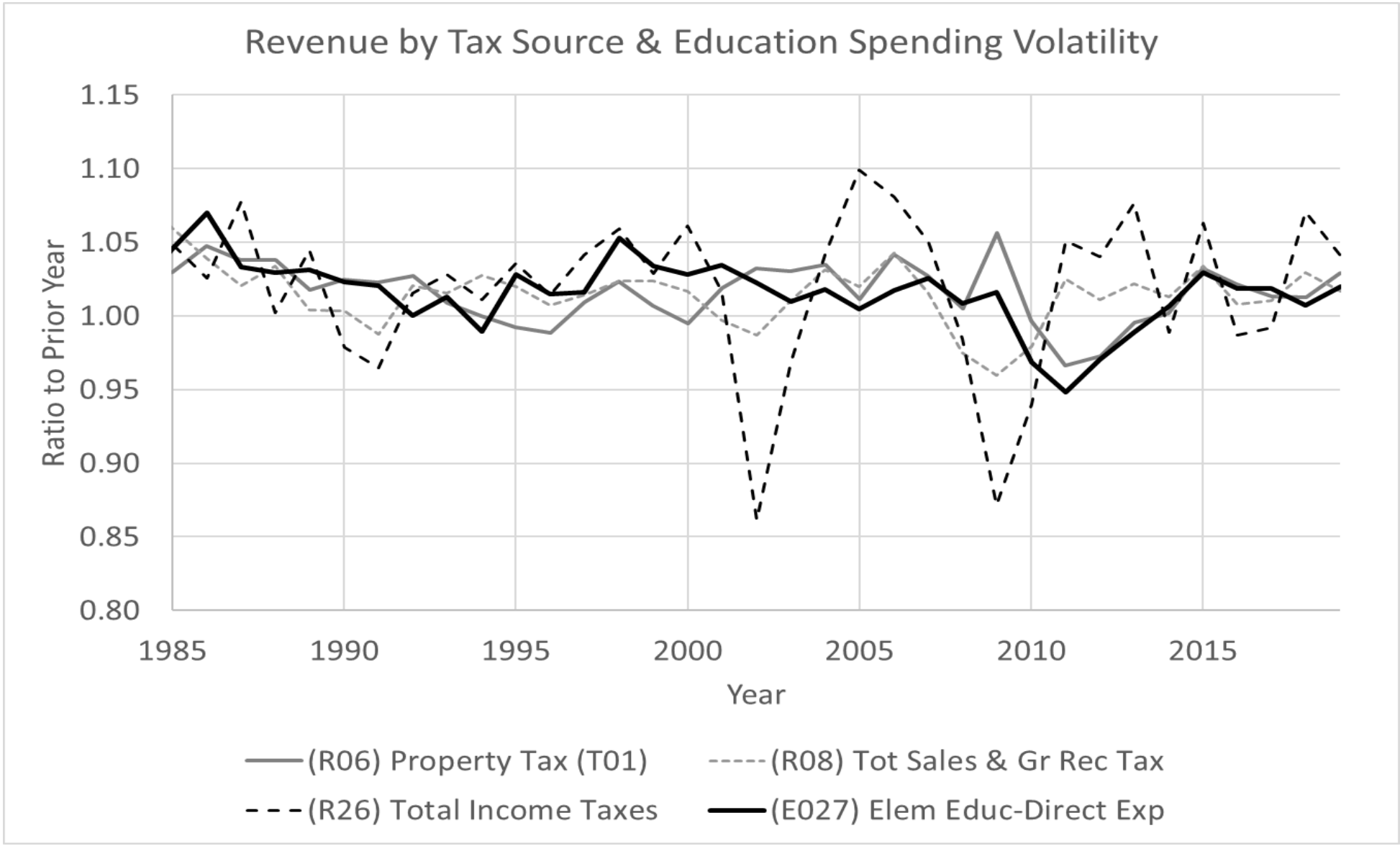
Standard errors in parentheses
* p<0.05

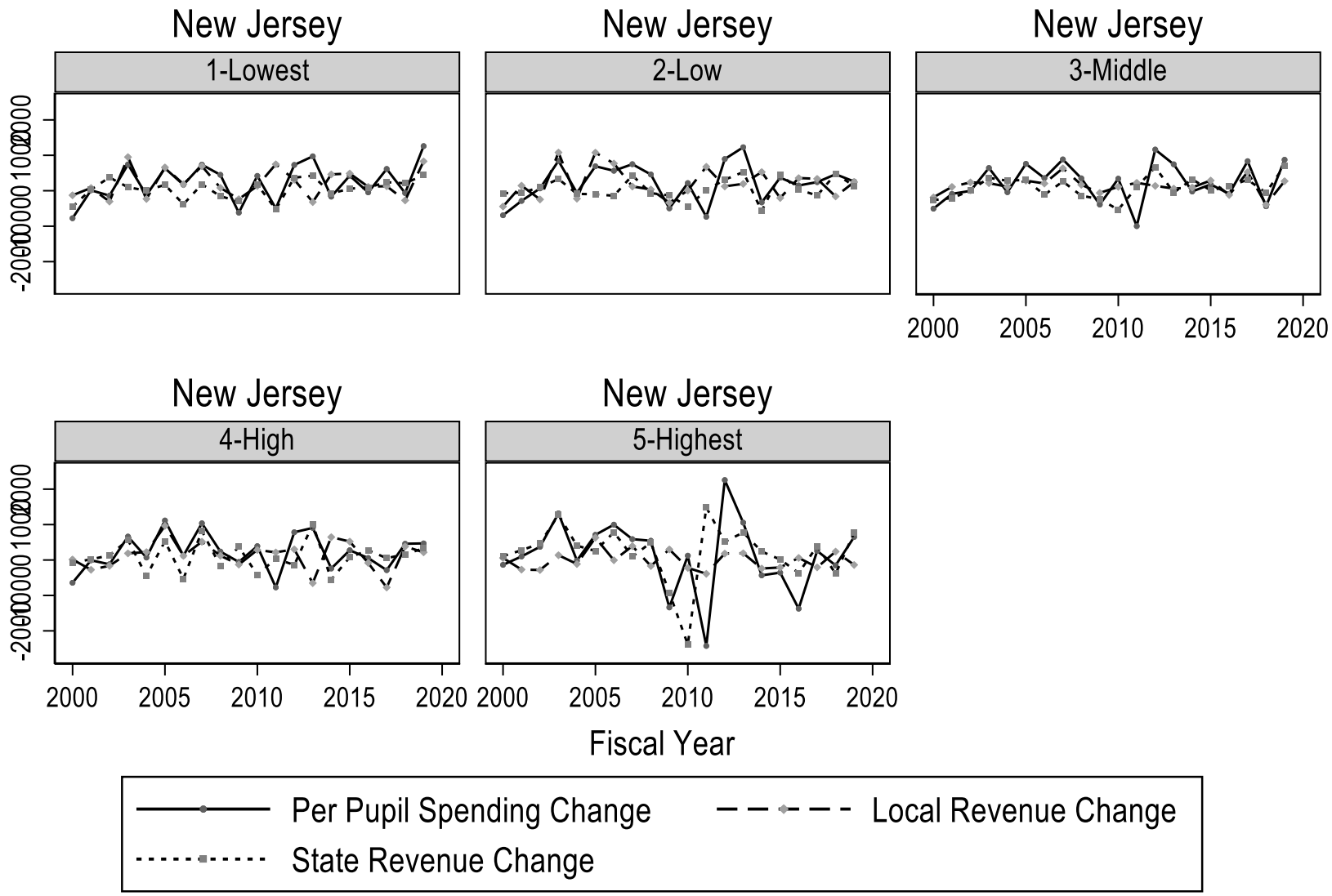
1. **States putting up more effort have more adequate funding in high poverty districts.**
2. **Increases in effort increase adequacy.**
3. Increased housing values and income increase adequacy (but not between state diffs)
4. States with larger charter shares have less adequate funding in high poverty districts, but increases in charter shares are associated with modest increases in adequacy.

Revenue Side Issues?

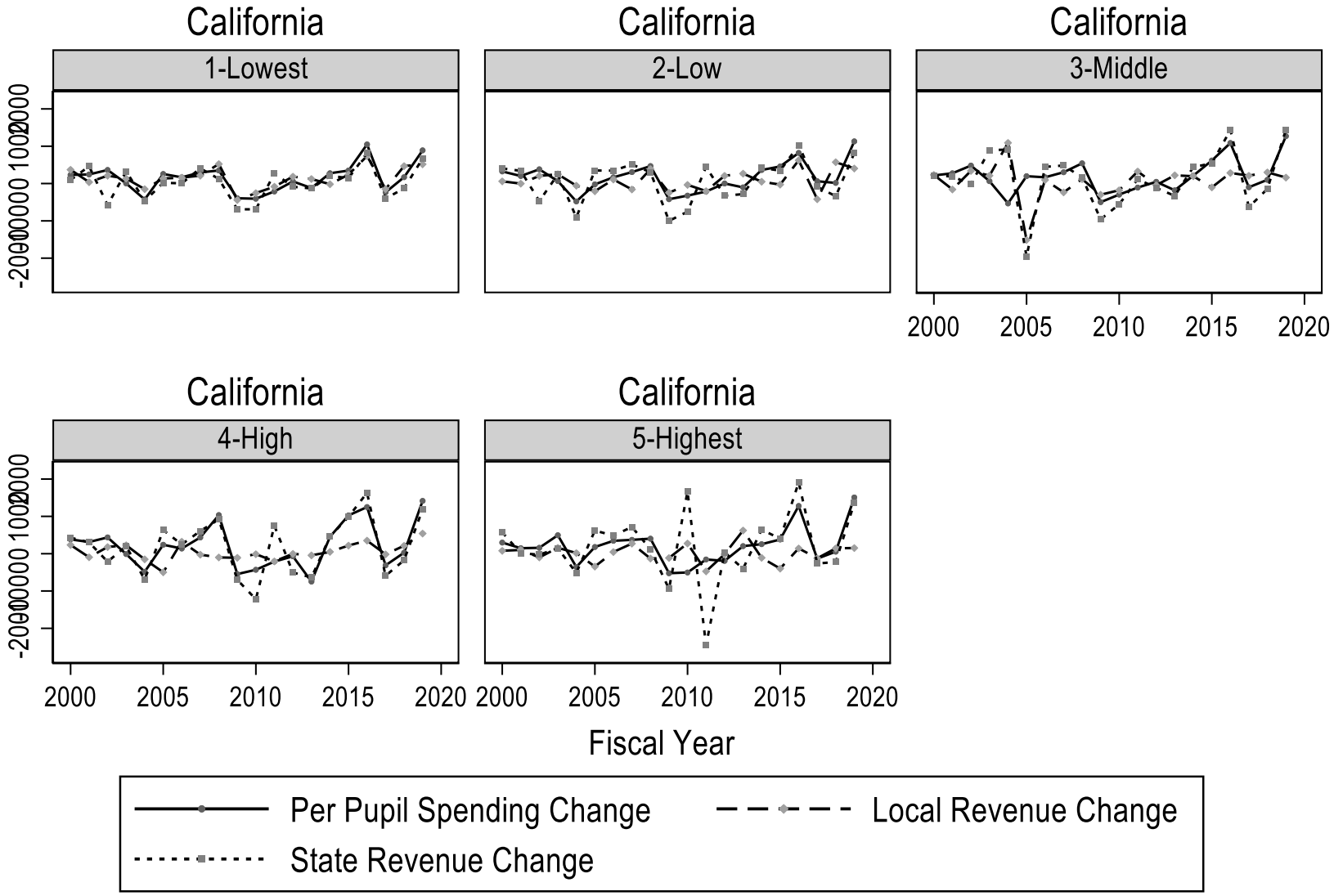
Please, study them!


Tax Source
Government Level
School Budgets
Income Tax
Sales Tax
Property Tax
State General Fund
County / Intermediate Gov't
*
Local / Municipal Gov't
School District Resources
Annual Operations
School District Resources
Capital Investment / Debt


Revenue by Tax Source & Education Spending Volatility
1.15
1.10
1.05
1.00
0.95
0.90
0.85
0.80
Ratio to Prior Year
1985
1990
1995
2000
2005
2010
2015
Year
(R06) Property Tax (T01)
(R08) Tot Sales & Gr Rec Tax
(R26) Total Income Taxes
(E027) Elem Educ-Direct Exp



Graphs by Poverty Quintile, state/year groups.



Graphs by Poverty Quintile, state/year groups.

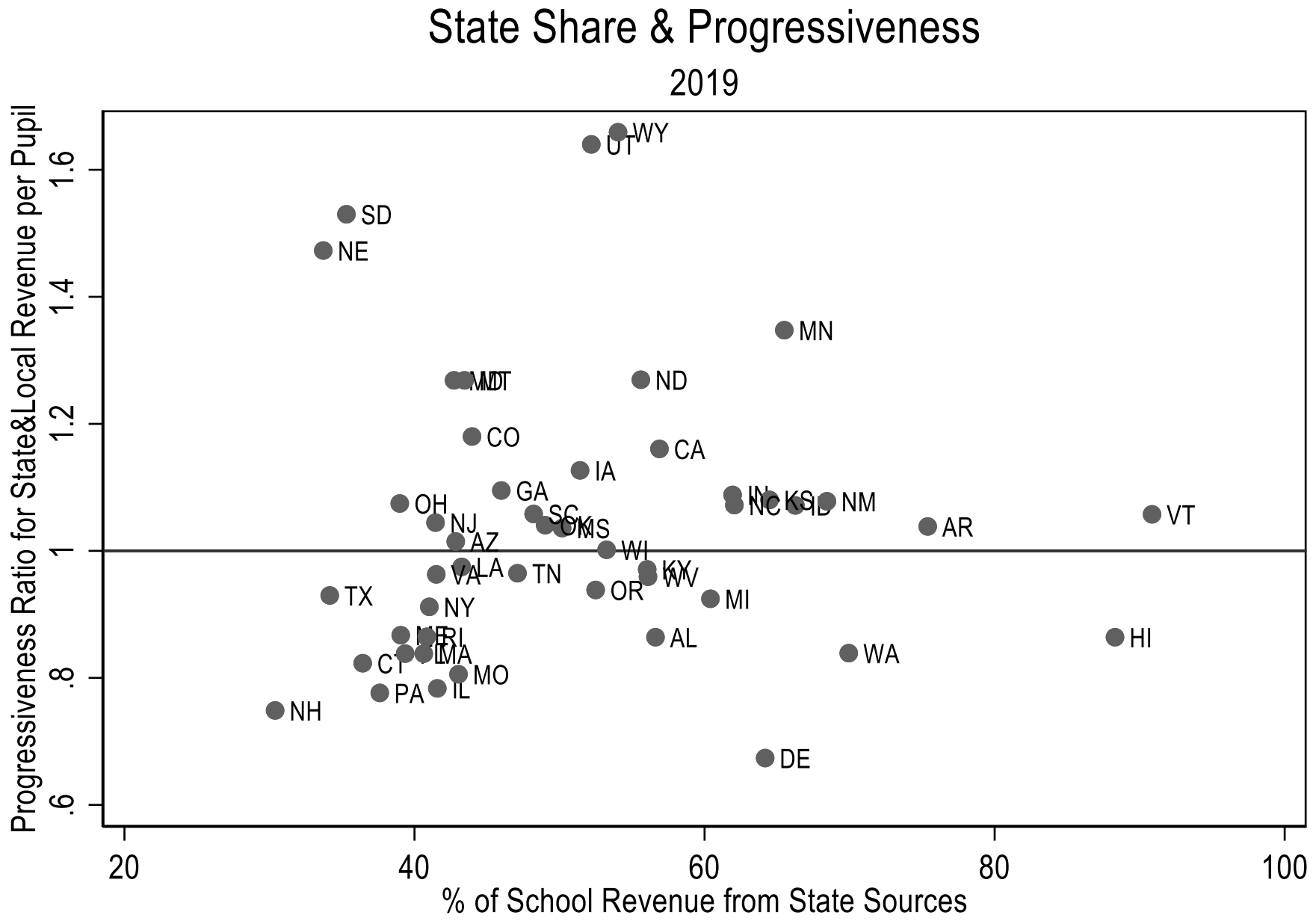


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Table 1. School Revenue Shares by Source and Fairness

DV= Progressiveness Ratio for Current Spending per Pupil	SFID		Urban	
	Between Effects	Fixed Effects	Between Effects	Fixed Effects
% School Revenue from Federal Sources	0.003	0.012*	0.001	0.001*
	(0.012)	(0.002)	(0.002)	(0.000)
% of School Revenue from State Sources	0.003	0.003*	-0.000	0.000
	(0.002)	(0.001)	(0.000)	(0.000)
State & Local Revenue as % of Personal Income	-3.966	4.014*	-0.751	0.496*
	(5.151)	(0.813)	(0.923)	(0.164)
Constant	1.221*	0.811*	1.066*	1.001*
	(0.269)	(0.051)	(0.048)	(0.011)
Observations	1,296	1,296	1,104	1,104
R-squared	0.059	0.056	0.040	0.014
Number of statefip	48	48	48	48

Standard errors in parentheses

* $p<0.05$

Table 3. Tax Revenue Shares & Progressiveness

DV= Progressiveness Ratio for Current Spending per Pupil	SFID		Urban	
	Between Effects	Fixed Effects	Between Effects	Fixed Effects
Income Tax as a Share of State & Local Taxes	-0.767	-0.300	-0.049	-0.004
	(0.417)	(0.187)	(0.074)	(0.035)
Sales Tax as a Share of State & Local Taxes	-0.712	-0.016	-0.024	0.119*
	(0.428)	(0.176)	(0.076)	(0.034)
Property Tax as a Share of State & Local Taxes	-0.859	-0.411*	-0.014	0.011
	(0.434)	(0.158)	(0.078)	(0.029)
State & Local Revenue as % of Personal Income	-3.872	3.727*	-0.945	0.475*
	(4.430)	(0.856)	(0.801)	(0.171)
Constant	2.078*	1.263*	1.099*	0.970*
	(0.410)	(0.132)	(0.072)	(0.025)
Observations	1,152	1,152	960	960
R-squared	0.113	0.022	0.052	0.024
Number of statefip	48	48	48	48

Standard errors in parentheses

* p<0.05

State Share & Adequacy

2018

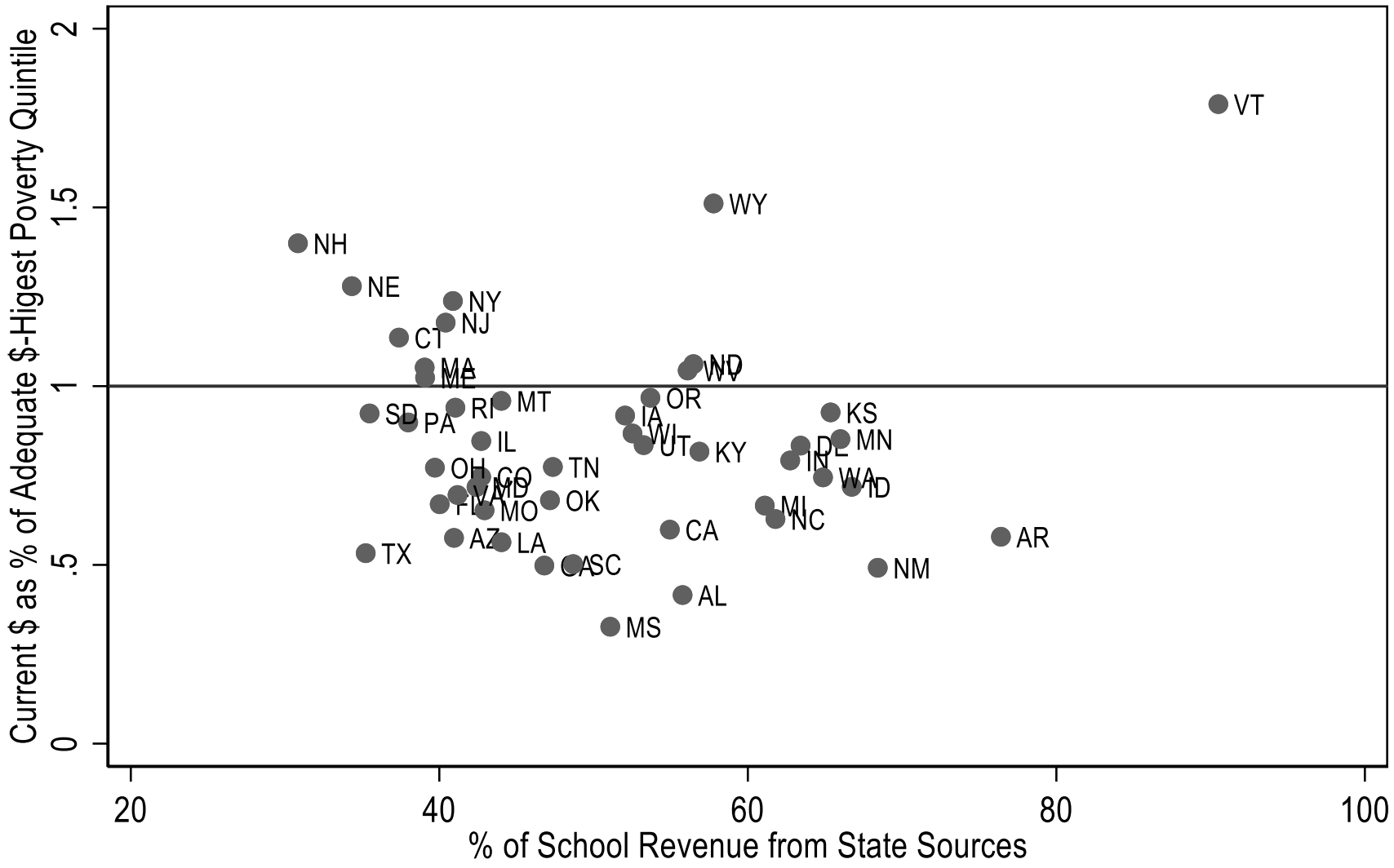

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Table 2. School Revenue Shares by Source and Adequacy

DV= Current $ as % of Adequate $- Highest Poverty Quintile	Between Effects	Fixed Effects
% School Revenue from Federal Sources	-0.039*	-0.000
	(0.014)	(0.002)
% of School Revenue from State Sources	-0.000	0.002*
	(0.003)	(0.001)
State & Local Revenue as % of Personal Income	18.081*	5.759*
	(6.518)	(0.885)
Constant	0.465	0.489*
	(0.351)	(0.073)
Observations	470	470
R-squared	0.509	0.099
Number of statefip	47	47

Standard errors in parentheses

* p<0.05

Table 4. Tax Revenue Shares and Adequacy

DV= Current $ as % of Adequate $- Highest Poverty Quintile	Between Effects	Within Effects
Income Tax as a Share of State & Local Taxes	-1.202*	-0.079
	(0.427)	(0.223)
Sales Tax as a Share of State & Local Taxes	-1.389*	-0.378
	(0.439)	(0.239)
Property Tax as a Share of State & Local Taxes	0.091	-0.513*
	(0.448)	(0.200)
State & Local Revenue as % of Personal Income	22.464*	6.334*
	(4.781)	(1.010)
Constant	0.675	0.885*
	(0.410)	(0.181)
Observations	470	470
R-squared	0.609	0.108
Number of statefip	47	47

Standard errors in parentheses

* p<0.05

Racial Disparities

And Racist Causes

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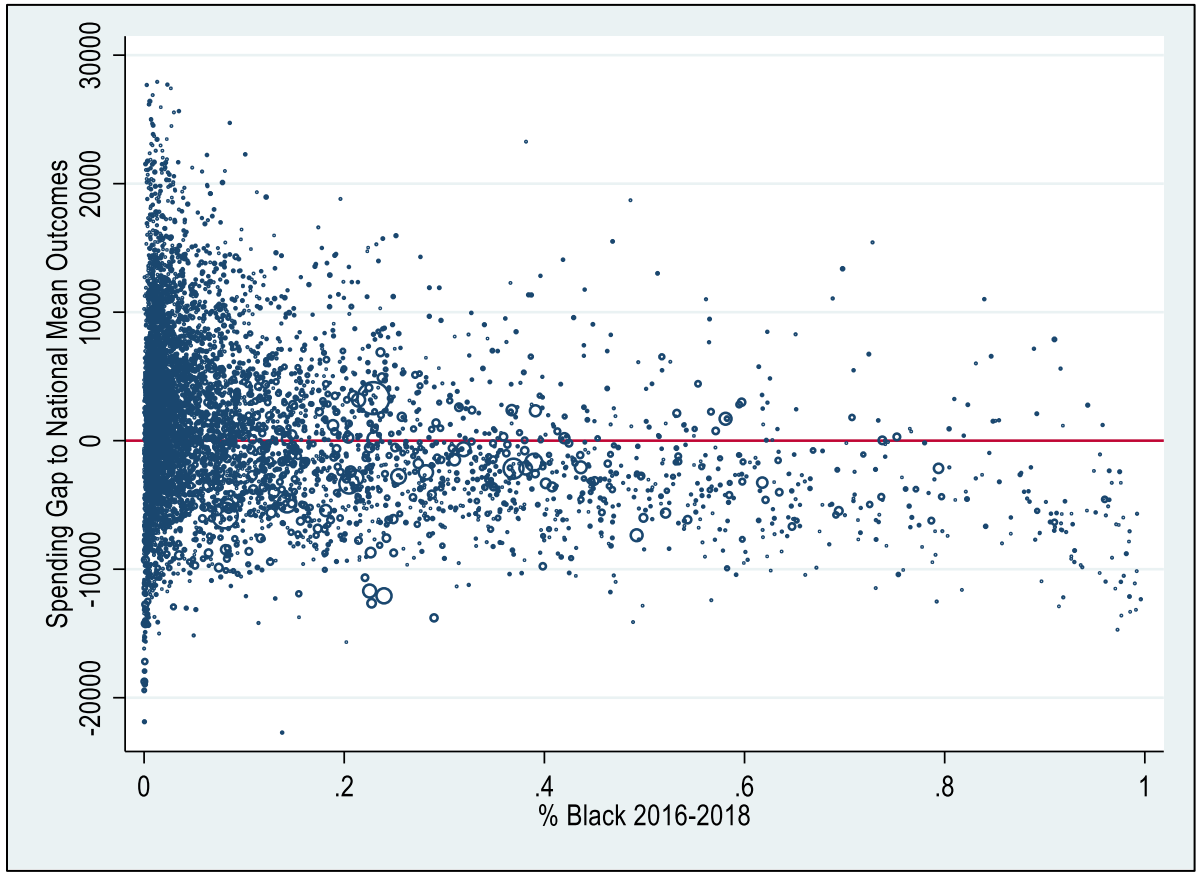
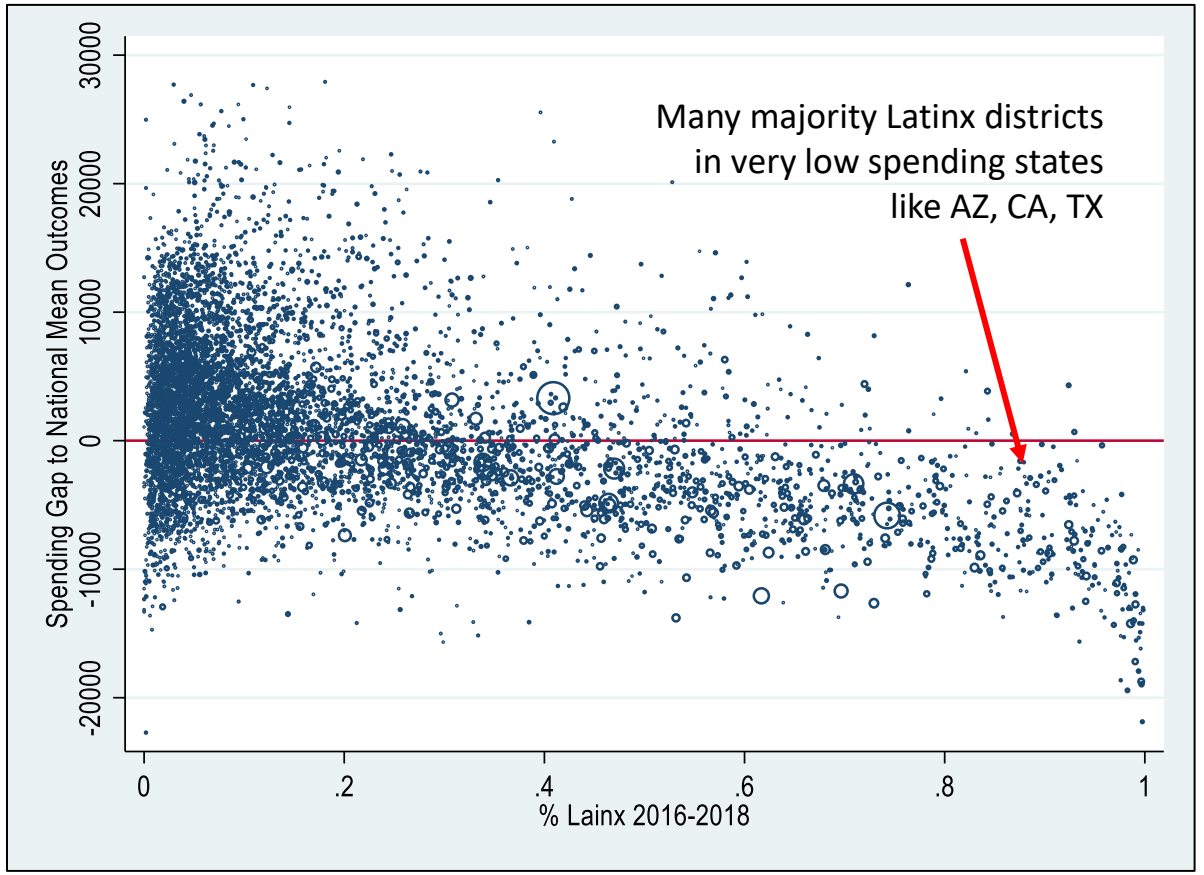
Spending adequacy and race

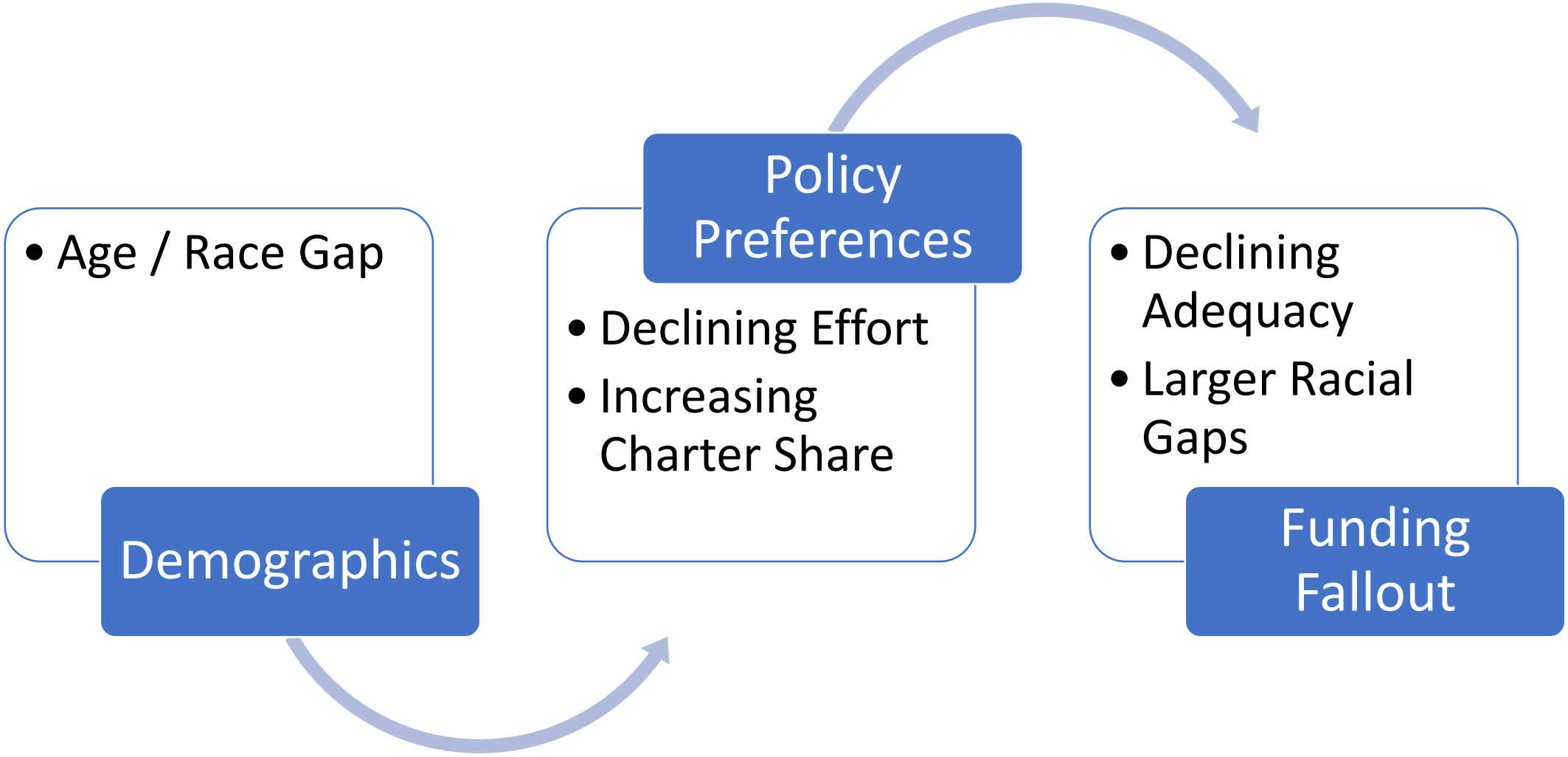
% Black & Spending Adequacy



% Latinx & Spending Adequacy



Biases of state & local voters



SEGREGATION AND SCHOOL FUNDING

How Housing Discrimination Reproduces Unequal Opportunity

Wednesday, April 20, 2022
3:30pm to 4:45pm ET

Register for this virtual event at:
shankerinstitute.org/segfundingevent

PANELISTS

Bruce D. Baker
Professor, Department of Educational Theory, Policy, and Administration, Rutgers University Graduate School of Education

Preston Green III
Professor of Educational Leadership and Law and the John and Maria Neag Professor of Urban Education at the Neag School, University of Connecticut

Ericka Weathers
Assistant Professor of Education, Department of Educational Policy Studies, Penn State University

Fedrick Ingram (moderator)
Secretary-Treasurer, Albert Shanker Institute and American Federation of Teachers

ASI
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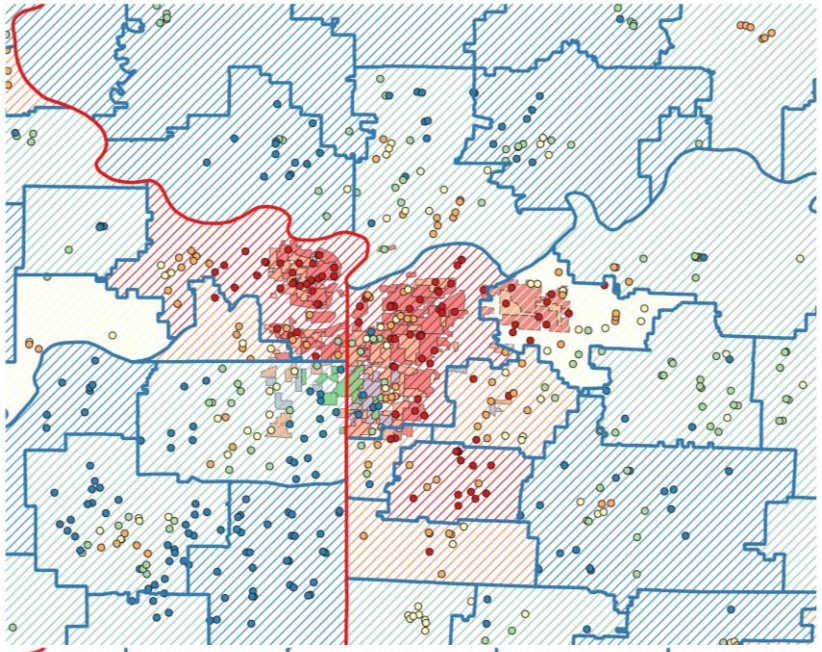
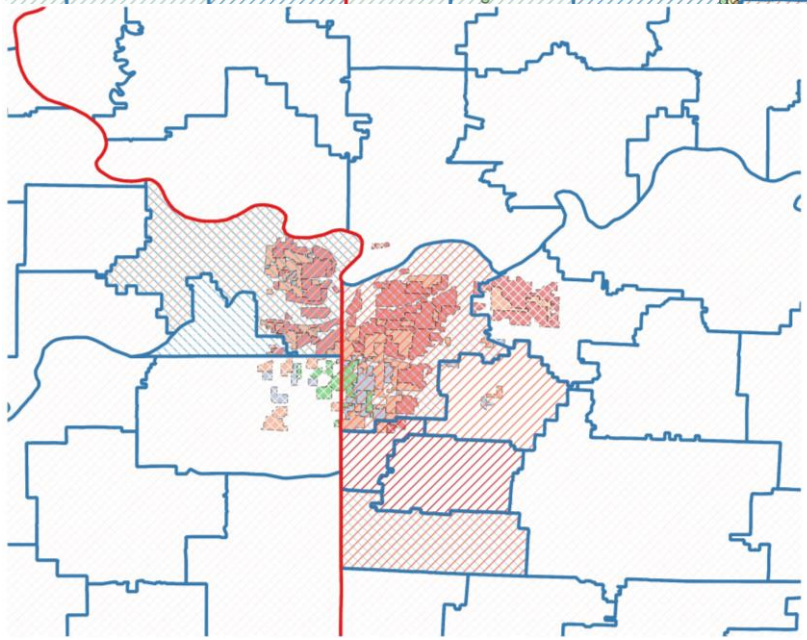
Racial Causes Require Race-Based Remedies

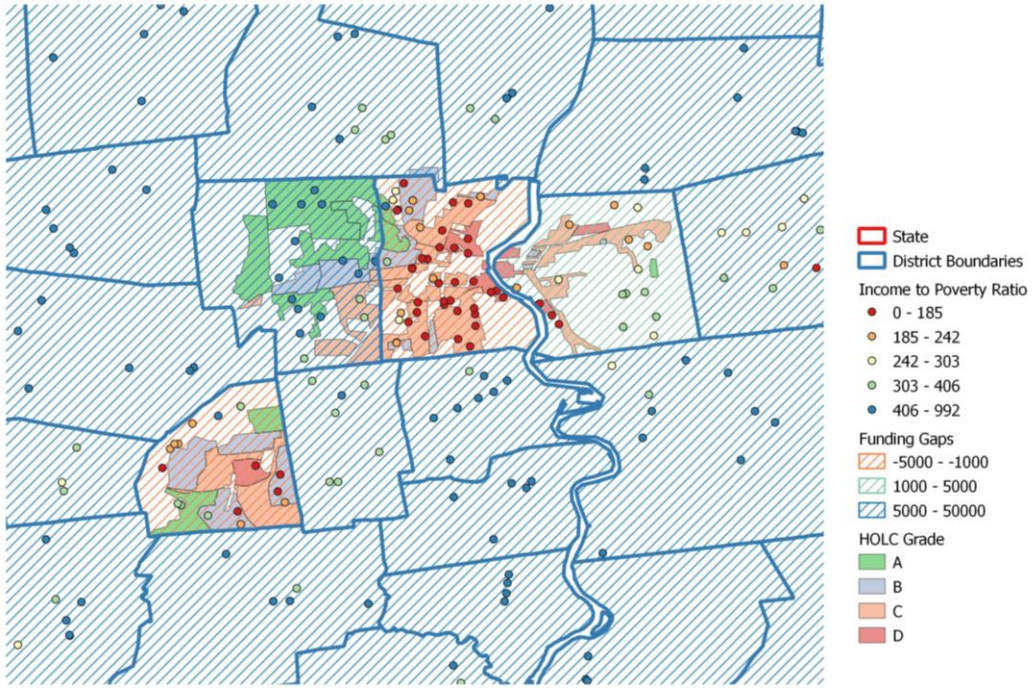
Race-Based Causes – Past & Present

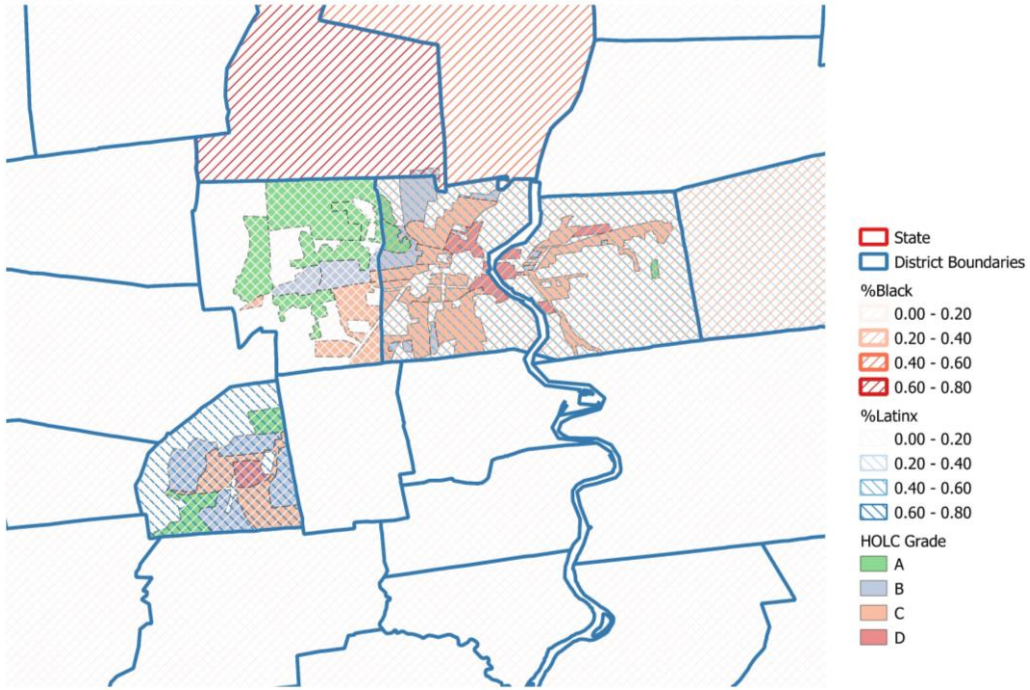
- FHA Discrimination →HOLC Redlining
- Restrictive Covenants & HoAs
- Block Busting
- Mortgage Lending Discrimination
- Steering (renting or buying)
- School District Boundary Gerrymandering

- **RACISM / DISCRIMINATION / SEGREGATION WAS/IS THE CAUSE OF THE ECONOMIC DISPARITIES!**
- **RACE TARGETED REMEDIES ARE THE SOLUTION!**









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Addressing the Educational Damages of Racial Isolation

- Preston C. Green II.; Bruce D. Baker; Joseph O. Oluwole, "School Finance, Race, and Reparations," Washington and Lee Journal of Civil Rights and Social Justice 27, no. 2 (Spring 2021): 483-558
- Baker, B. D. (2011). Exploring the sensitivity of education costs to racial composition of schools and race-neutral alternative measures: A cost function application to Missouri. *Peabody Journal of Education*, *86*(1), 58-83.

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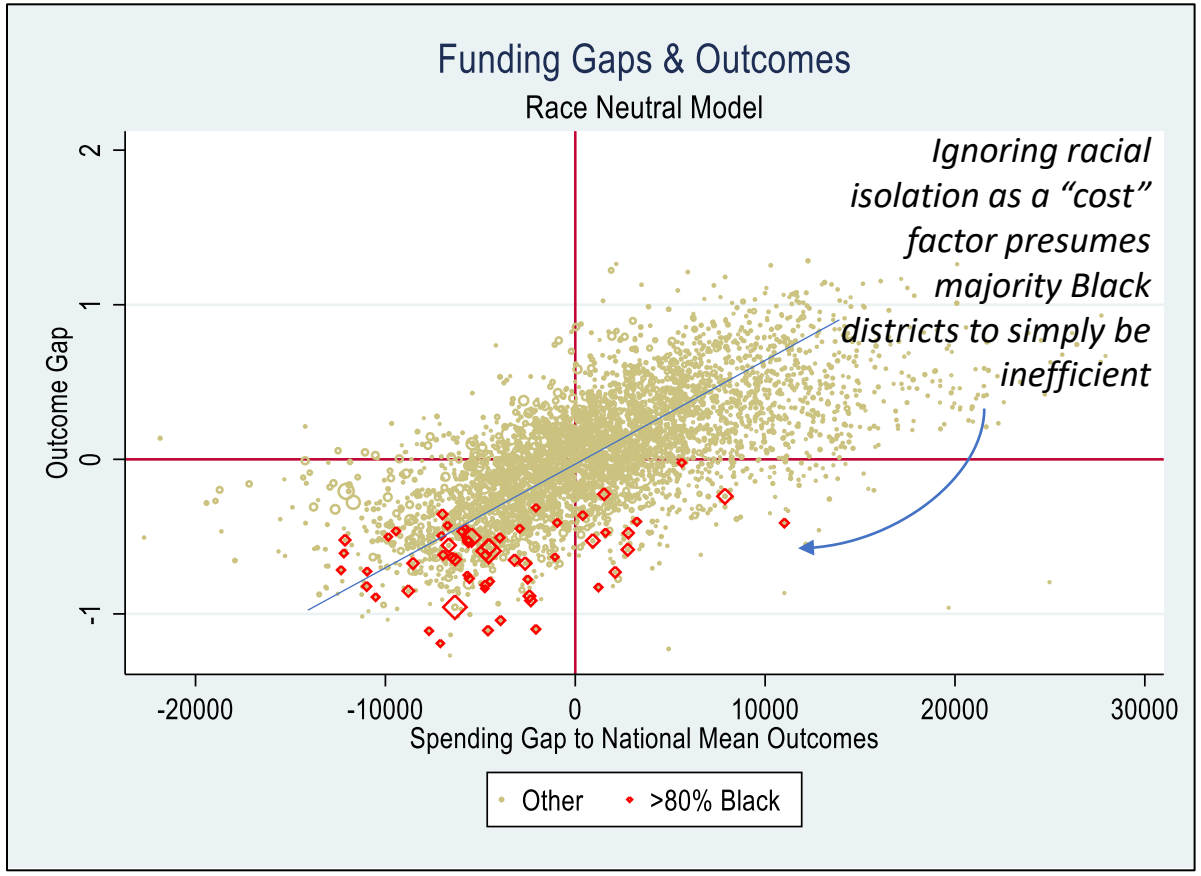
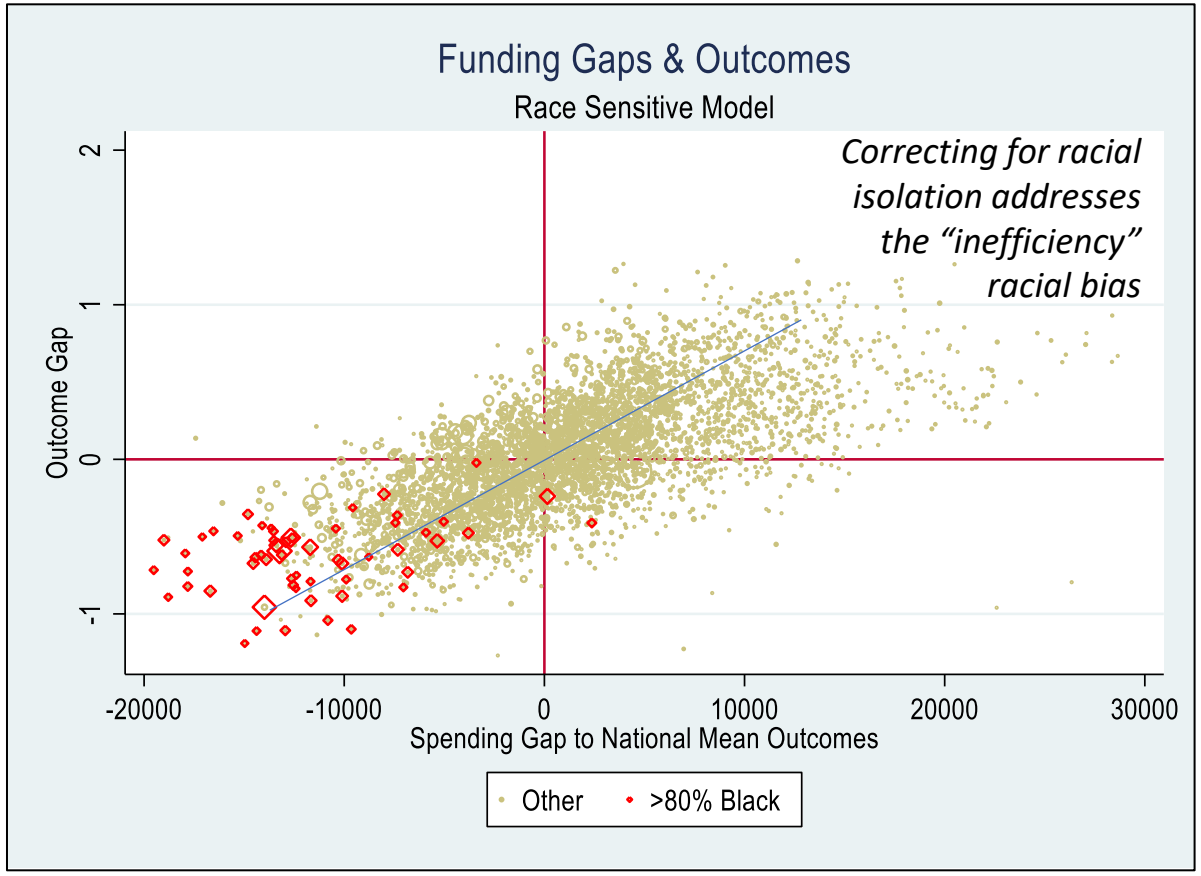
Racial isolation is a "cost" factor which must be compensated in state school finance formulas

This isn't "deficit thinking" it's "reparations thinking"





DV = Residuals from Table 1 Regressions	(1) Race Neutral Residuals [All]	(2) Race Neutral Residuals [>20% Pov]	(3) Race Neutral Residuals [<10% Pov]	(4) Race Sensitive Residuals [All]	(5) Race Sensitive Residuals [>20% Pov]	(6) Race Sensitive Residuals [<10% Pov]
% Black	-0.504*	-0.433*	-0.422*	-0.126*	-0.019*	0.012
	(0.004)	(0.005)	(0.020)	(0.004)	(0.005)	(0.020)
% Latinx	-0.091*	0.015*	0.005	-0.176*	-0.042*	-0.062*
	(0.003)	(0.004)	(0.015)	(0.003)	(0.004)	(0.015)
Constant	0.100*	0.015*	0.181*	0.062*	-0.058*	0.151*
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Observations	114,735	42,557	26,152	114,735	42,557	26,152
R-squared	0.137	0.168	0.017	0.037	0.003	0.001

Standard errors in parentheses

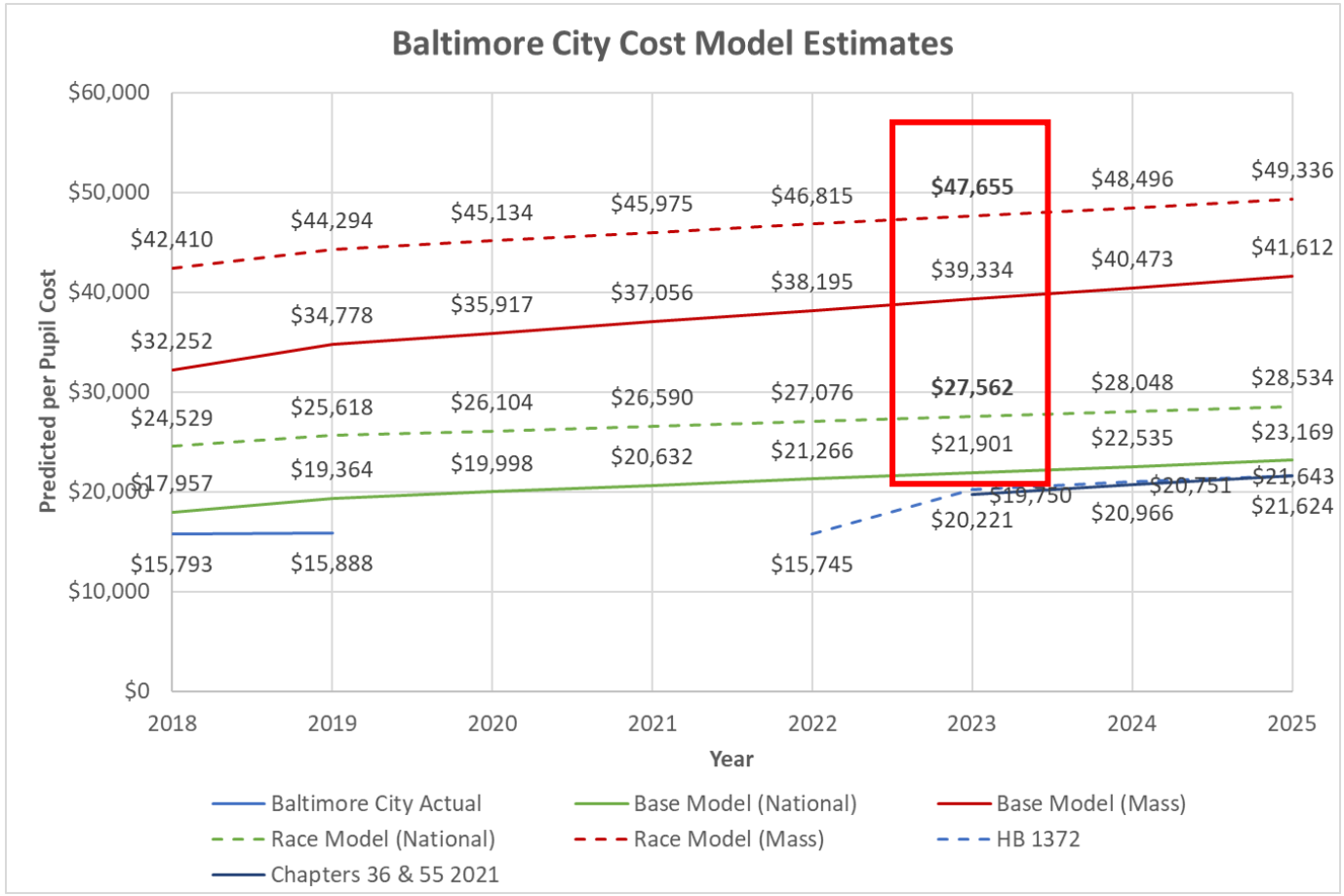
* p<0.05

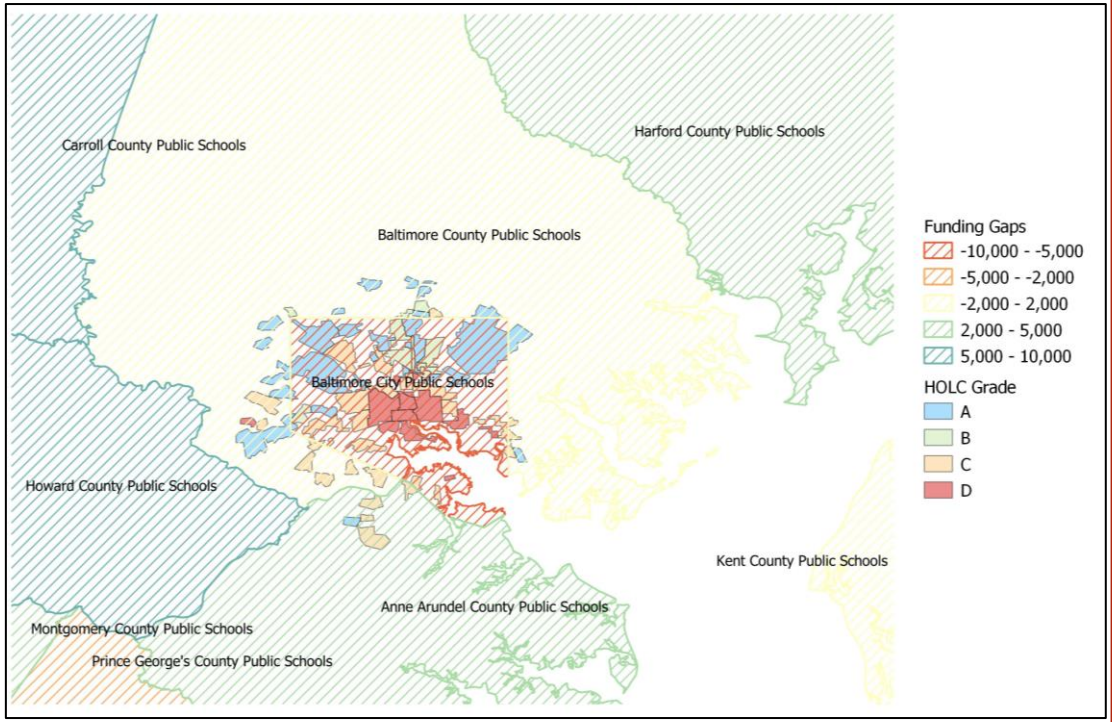
VARIABLES	(1) Race Neutral Residuals [All]	(2) Race Neutral Residuals [>20% Pov]	(3) Race Neutral Residuals [<10% Pov]	(4) Race Sensitive Residuals [All]	(5) Race Sensitive Residuals [>20% Pov]	(6) Race Sensitive Residuals [<10% Pov]
Income to Poverty Ratio	0.001*	0.001*	0.001*	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Latinx	0.021*	0.027*	-0.031*	-0.051*	-0.024*	-0.100*
	(0.003)	(0.004)	(0.014)	(0.003)	(0.004)	(0.014)
% Black	**-0.370***	**-0.433***	**-0.386***	0.026*	-0.014*	0.051*
	(0.004)	(0.005)	(0.018)	(0.004)	(0.005)	(0.018)
YEAR = 2010	-0.001	0.013*	-0.018*	0.000	0.014*	-0.011
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2011	-0.004	0.009	-0.019*	0.001	0.014*	-0.003
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2012	-0.006*	0.009	-0.023*	0.001	0.014*	-0.006
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2013	-0.008*	0.002	-0.022*	-0.000	0.008	-0.005
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2014	-0.009*	0.000	-0.012	-0.001	0.007	0.005
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2015	-0.008*	-0.014*	0.008	0.001	-0.007	0.024*
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2016	-0.007*	-0.019*	0.023*	0.003	-0.014*	0.035*
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2017	-0.007*	-0.026*	0.033*	0.003	-0.019*	0.043*
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
YEAR = 2018	-0.008*	-0.026*	0.028*	0.003	-0.018*	0.037*
	(0.003)	(0.005)	(0.006)	(0.003)	(0.005)	(0.006)
Constant	-0.179*	-0.145*	-0.197*	-0.246*	-0.256*	-0.203*
	(0.003)	(0.006)	(0.006)	(0.003)	(0.006)	(0.007)
Observations	114,717	42,539	26,152	114,717	42,539	26,152
R-squared	0.261	0.197	0.204	0.192	0.049	0.160

Standard errors in parentheses

* p<0.05

When we include race in the model, cost estimates to provide equal opportunity in racially isolated black districts are much higher!





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Data & Tools for School Finance Research, Exploration & Teaching

School Finance Indicators Database & Reports

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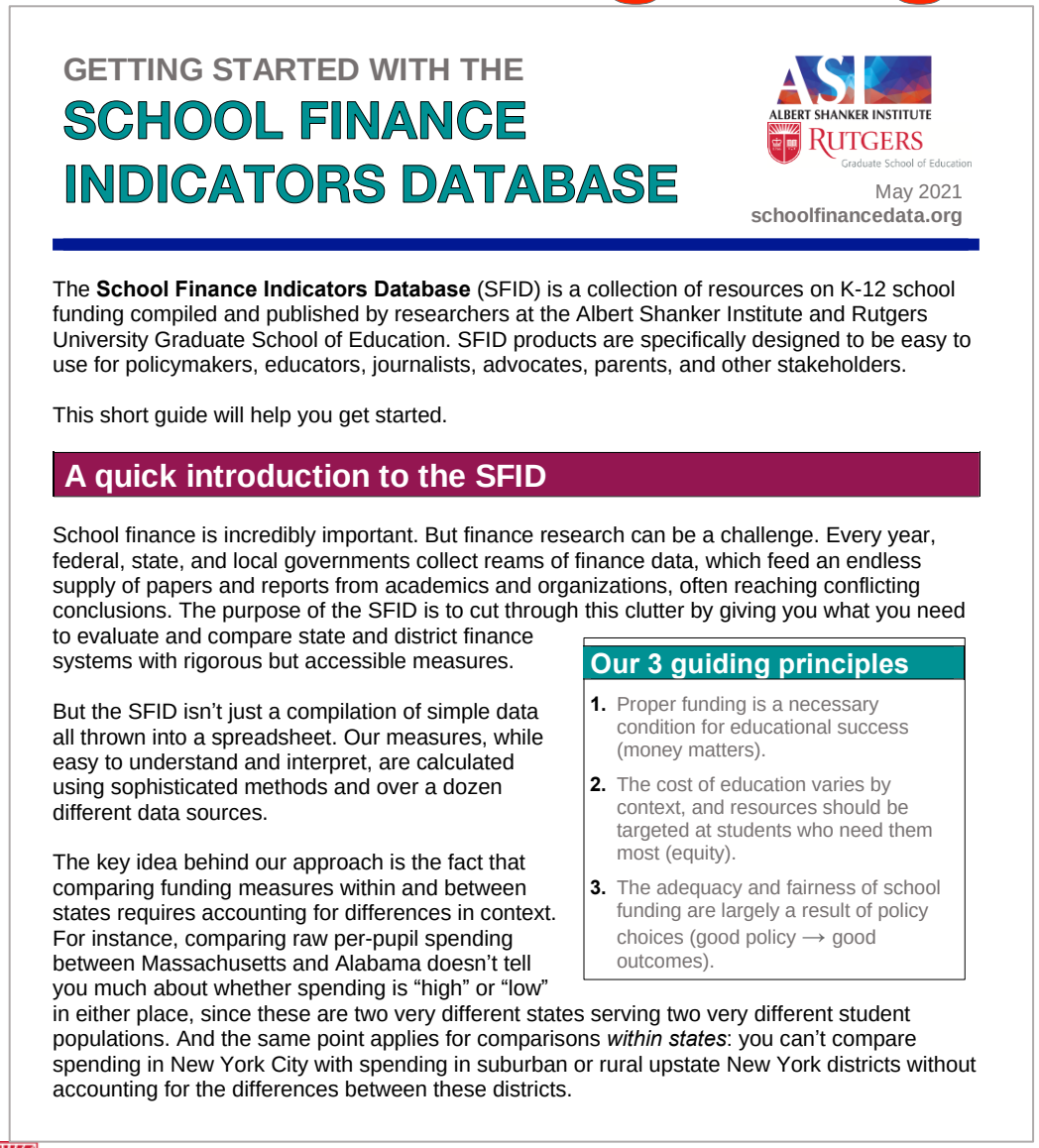
Using our data and resources

- The purpose of this project is to inform and improve school finance debates and policymaking in the U.S.
- All our resources are designed to be used by all stakeholders, regardless of their finance or research backgrounds
- Our state and district datasets are free to download for yourself, along with user-friendly documentation
  - These datasets (and accompanying documentation) include many measures not discussed in this presentation, such as teacher salary competitiveness, staffing ratios, etc.
- But we also have many resources that you can use without analyzing the data yourself, and everything is available at the SFID website:

schoolfinancedata.org

Resources: getting started guide



GETTING STARTED WITH THE

SCHOOL FINANCE INDICATORS DATABASE

ALBERT SHANKER INSTITUTE
RUTGERS Graduate School of Education

May 2021
schoolfinancedata.org

The **School Finance Indicators Database** (SFID) is a collection of resources on K-12 school funding compiled and published by researchers at the Albert Shanker Institute and Rutgers University Graduate School of Education. SFID products are specifically designed to be easy to use for policymakers, educators, journalists, advocates, parents, and other stakeholders.

This short guide will help you get started.

A quick introduction to the SFID

School finance is incredibly important. But finance research can be a challenge. Every year, federal, state, and local governments collect reams of finance data, which feed an endless supply of papers and reports from academics and organizations, often reaching conflicting conclusions. The purpose of the SFID is to cut through this clutter by giving you what you need to evaluate and compare state and district finance systems with rigorous but accessible measures.

But the SFID isn't just a compilation of simple data all thrown into a spreadsheet. Our measures, while easy to understand and interpret, are calculated using sophisticated methods and over a dozen different data sources.

Our 3 guiding principles

1. Proper funding is a necessary condition for educational success (money matters).
2. The cost of education varies by context, and resources should be targeted at students who need them most (equity).
3. The adequacy and fairness of school funding are largely a result of policy choices (good policy → good outcomes).

The key idea behind our approach is the fact that comparing funding measures within and between states requires accounting for differences in context. For instance, comparing raw per-pupil spending between Massachusetts and Alabama doesn't tell you much about whether spending is "high" or "low" in either place, since these are two very different states serving two very different student populations. And the same point applies for comparisons *within states*: you can't compare spending in New York City with spending in suburban or rural upstate New York districts without accounting for the differences between these districts.

NEW! Check out our short "**Getting Started with the SFID**" guide, which includes:

- Descriptions of the datasets and resources, including many variables not discussed today
- A catalog of all data visualizations
- Walk-through example of how to download and use our datasets (in Excel)

This guide was uploaded to this session's resources and is also available on the SFID website

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$$(\ln)SCHOOL = b_0 + b_1State_i + b_2LaborMarket_i + b_3CWI_i + b_4FINANCE_i + b_5PopulationDensity_i + b_6Enrollment_i + b_7INDICATORS_i + b_8Scale_i + b_9Poverty_i + b_{10}SchlType_i + b_{11}DATABASE_i + e$$

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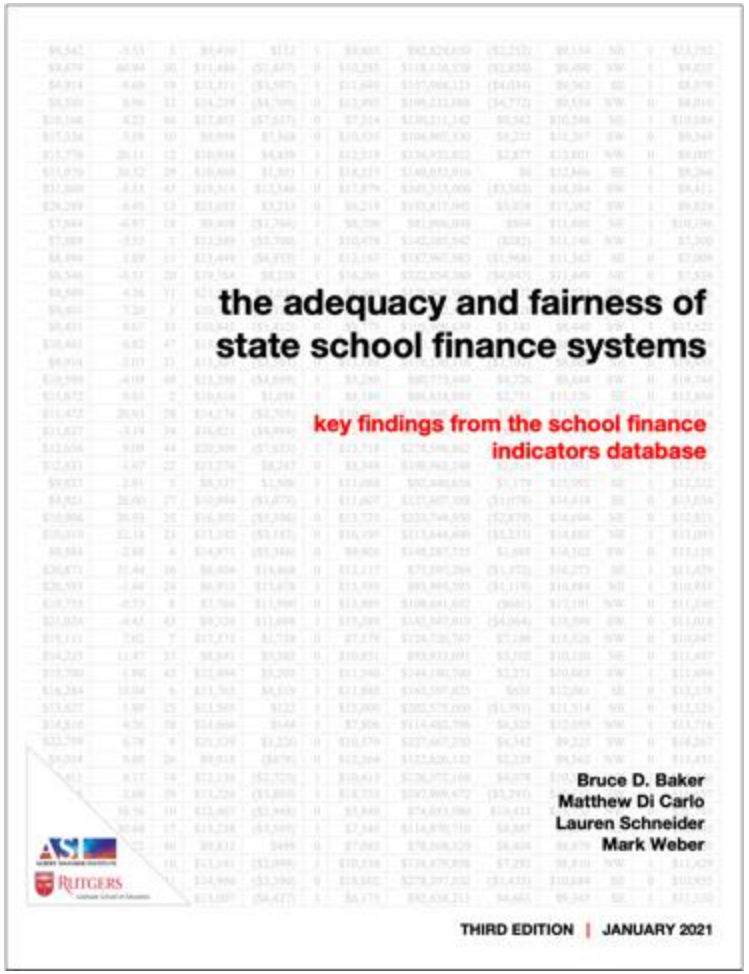
Resources: annual report and research briefs



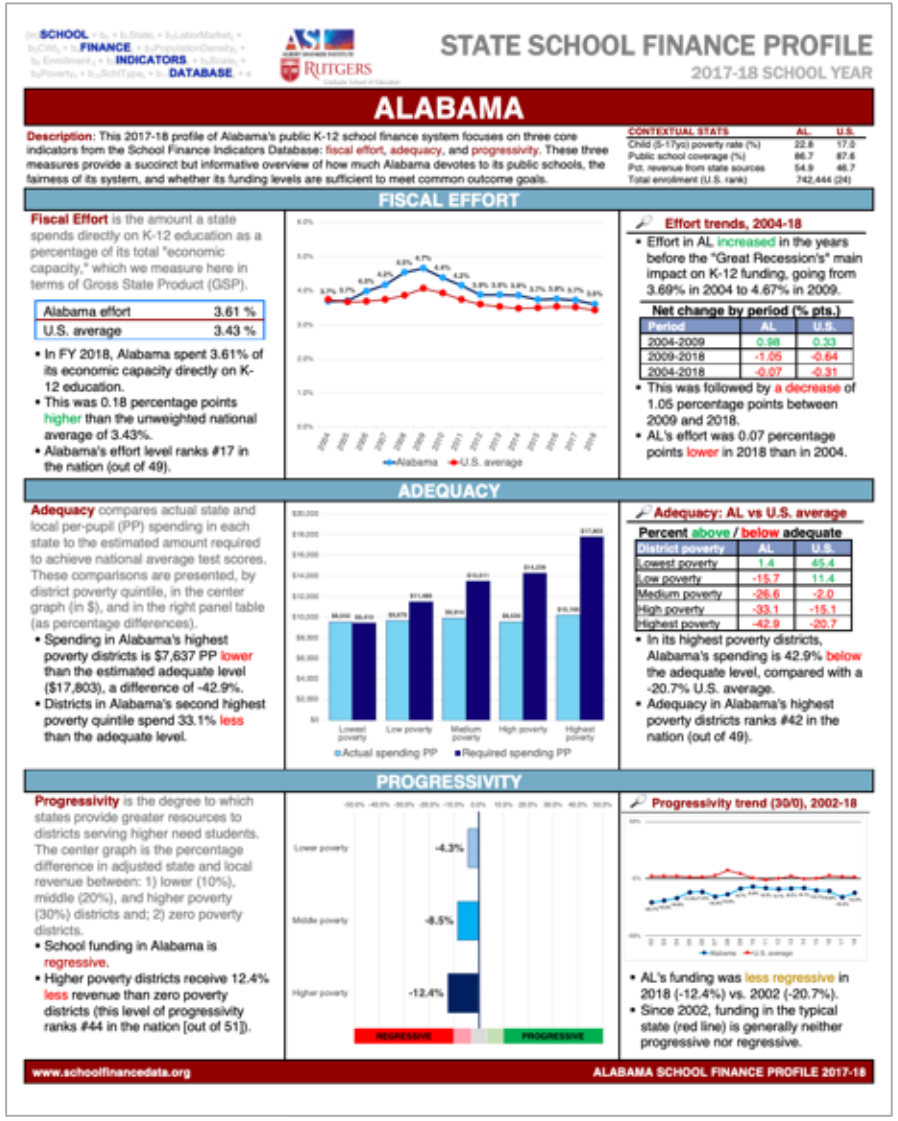
ANNUAL REPORT

Summarizes the latest findings on the three “core indicators”

RESEARCH BRIEFS

Occasional analyses of different measures not included in the annual report or profiles.

Resources: one-page state profiles



STATE SCHOOL FINANCE PROFILE

2017-18 SCHOOL YEAR

ALABAMA

Description: This 2017-18 profile of Alabama's public K-12 school finance system focuses on three core indicators from the School Finance Indicators Database: fiscal effort, adequacy, and progressivity. These three measures provide a succinct but informative overview of how much Alabama devotes to its public schools, the fairness of its system, and whether its funding levels are sufficient to meet common outcome goals.

CONTEXTUAL STATS	AL	U.S.
Child (5-17yo) poverty rate (%)	22.8	17.0
Public school coverage (%)	86.7	87.6
Pct. revenue from state sources	54.9	46.7
Total enrollment (U.S. rank)	742,444 (24)	

FISCAL EFFORT

Fiscal Effort is the amount a state spends directly on K-12 education as a percentage of its total "economic capacity," which we measure here in terms of Gross State Product (GSP).

Alabama effort	3.61 %
U.S. average	3.43 %

- In FY 2018, Alabama spent 3.61% of its economic capacity directly on K-12 education.
- This was 0.18 percentage points higher than the unweighted national average of 3.43%.
- Alabama's effort level ranks #17 in the nation (out of 49).

Alabama U.S. average

Effort trends, 2004-18

- Effort in AL increased in the years before the "Great Recession's" main impact on K-12 funding, going from 3.69% in 2004 to 4.67% in 2009.

Net change by period (% pts.)

Period	AL	U.S.
2004-2009	0.98	0.33
2009-2018	-1.05	-0.64
2004-2018	-0.07	-0.31

- This was followed by a decrease of 1.05 percentage points between 2009 and 2018.
- AL's effort was 0.07 percentage points lower in 2018 than in 2004.

ADEQUACY

Adequacy compares actual state and local per-pupil (PP) spending in each state to the estimated amount required to achieve national average test scores. These comparisons are presented, by district poverty quintile, in the center graph (in $), and in the right panel table (as percentage differences).

- Spending in Alabama's highest poverty districts is $7,637 PP lower than the estimated adequate level ($17,803), a difference of -42.9%.
- Districts in Alabama's second highest poverty quintile spend 33.1% less than the adequate level.

Lowest poverty Low poverty Medium poverty High poverty Highest poverty

Actual spending PP Required spending PP

Adequacy: AL vs U.S. average

Percent above / below adequate

District poverty	AL	U.S.
Lowest poverty	1.4	45.4
Low poverty	-15.7	11.4
Medium poverty	-26.6	-2.0
High poverty	-33.1	-15.1
Highest poverty	-42.9	-20.7

- In its highest poverty districts, Alabama's spending is 42.9% below the adequate level, compared with a -20.7% U.S. average.
- Adequacy in Alabama's highest poverty districts ranks #42 in the nation (out of 49).

PROGRESSIVITY

Progressivity is the degree to which states provide greater resources to districts serving higher need students. The center graph is the percentage difference in adjusted state and local revenue between: 1) lower (10%), middle (20%), and higher poverty (30%) districts and; 2) zero poverty districts.

- School funding in Alabama is regressive.
- Higher poverty districts receive 12.4% less revenue than zero poverty districts (this level of progressivity ranks #44 in the nation [out of 51]).

Lower poverty -4.3%

Middle poverty -8.5%

Higher poverty -12.4%

REGRESSIVE PROGRESSIVE

Progressivity trend (30/0), 2002-18

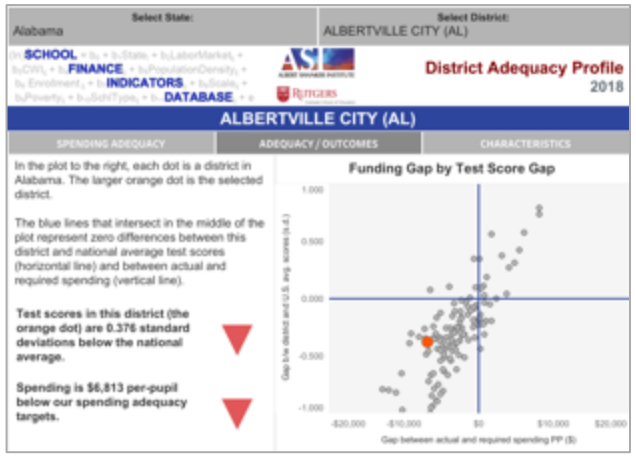
- AL's funding was less regressive in 2018 (-12.4%) vs. 2002 (-20.7%).
- Since 2002, funding in the typical state (red line) is generally neither progressive nor regressive.

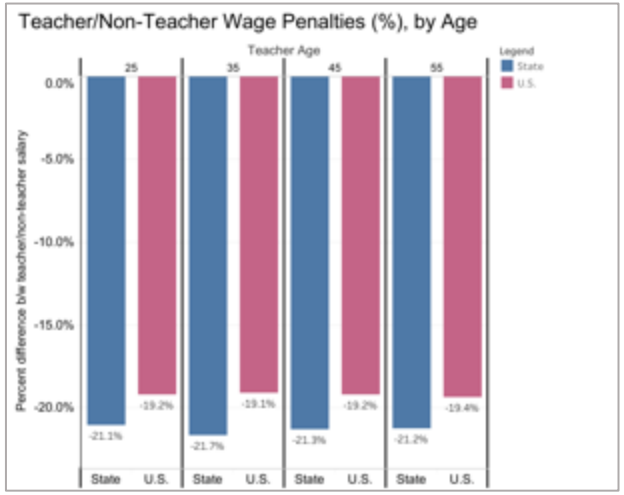
www.schoolfinancedata.org ALABAMA SCHOOL FINANCE PROFILE 2017-18

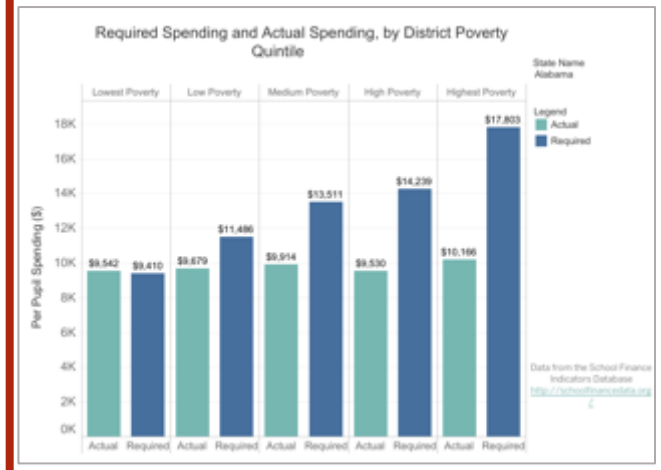
The profiles summarize, visualize, and describe in clear language the key results for each state (and D.C.)

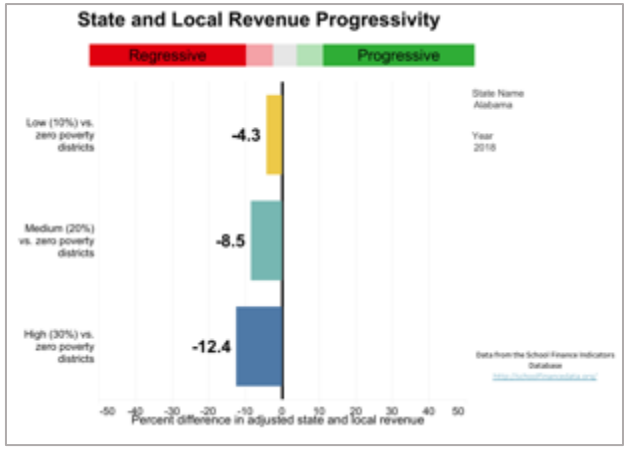
- Focus on the "core indicators" of effort, adequacy, and progressivity
- Comparisons with U.S. averages
- Trends over time
- Updated annually with latest data

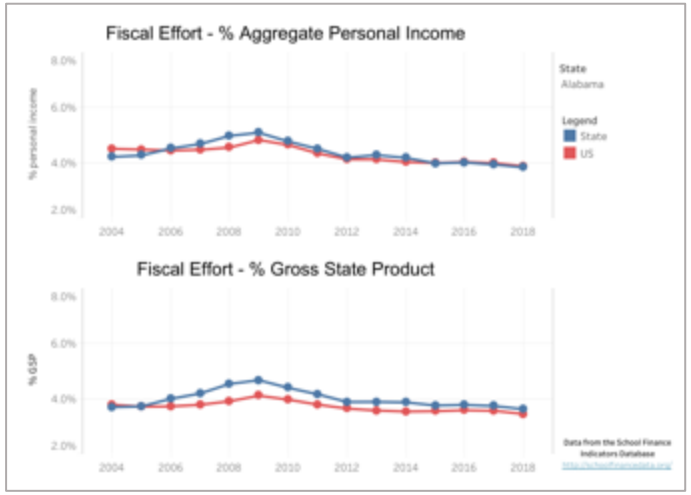
Resources: online data visualizations











Visualize the latest results for a state or district on a group of selected measures (including the three “core indicators”).

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$(\ln)\mathbf{SCHOOL}_i = b_0 + b_1 State_i + b_2 LaborMarket_i + b_3 CWI_i + b_4 \mathbf{FINANCE}_i + b_5 PopulationDensity_i + b_6 Enrollment_i + b_7 \mathbf{INDICATORS}_i + b_8 Scale_i + b_9 Poverty_i + b_{10} SchlType_i + b_{11} \mathbf{DATABASE}_i + e$

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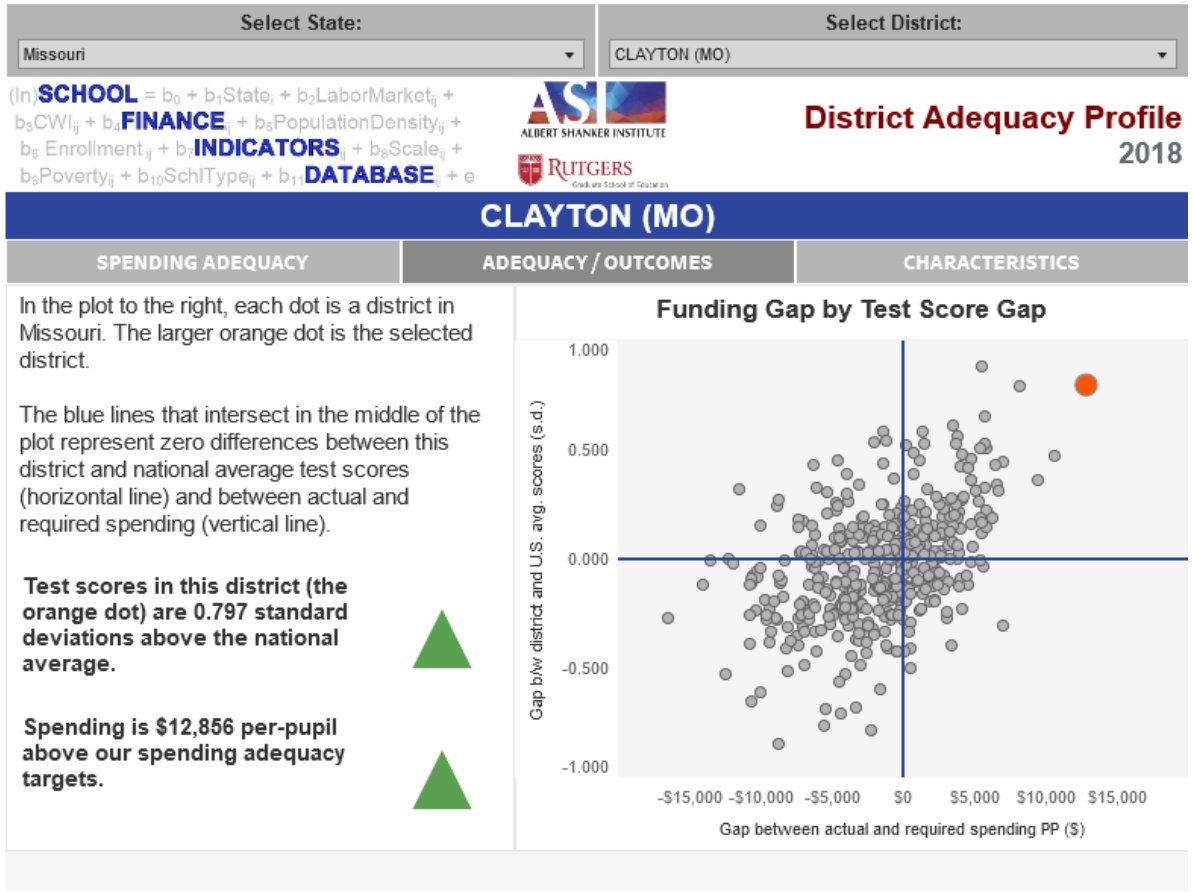
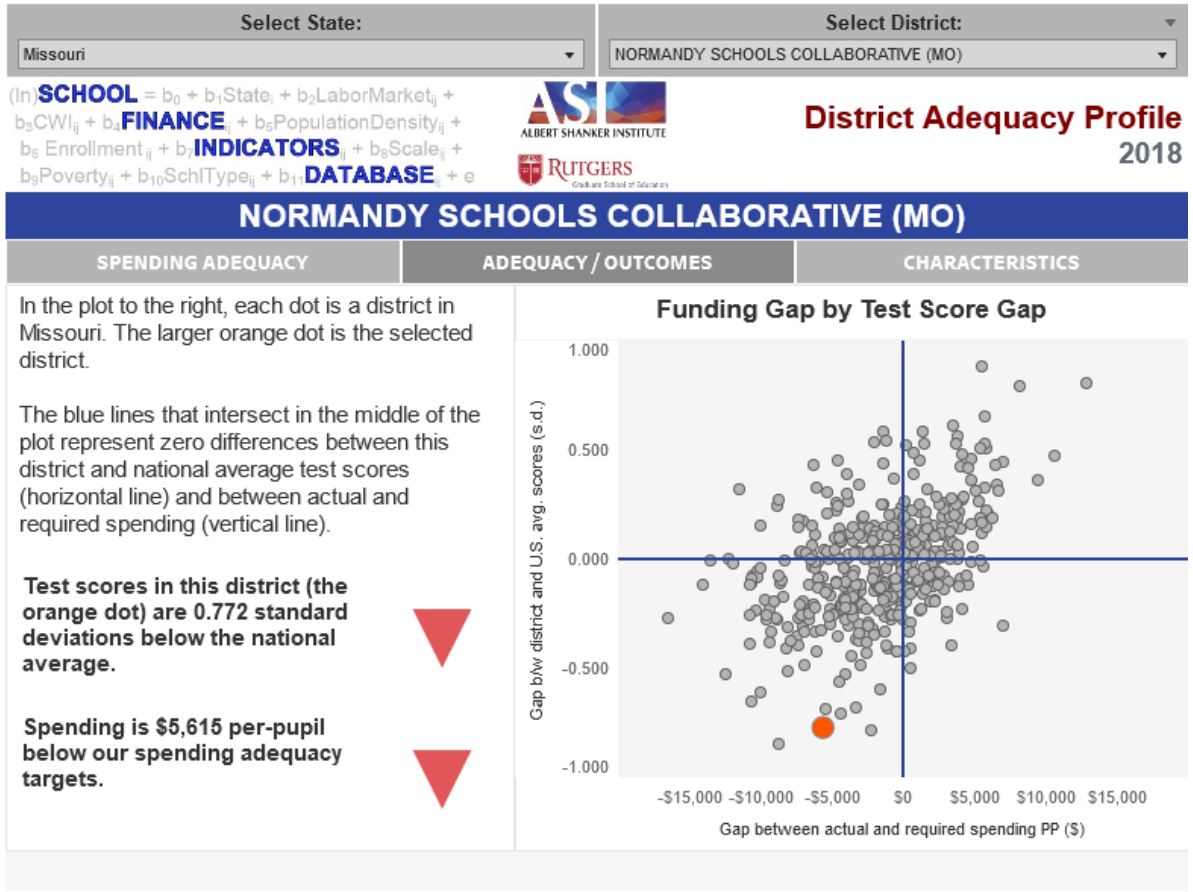
Resources: visualization example





District adequacy profiles for two Missouri districts

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Awesome data sets to use in combination

- School Finance Indicators Database (1993-2019, state & district level)
  - https://www.schoolfinancedata.org/download-data/
- Correlates of State Policy (through 2016, state level)
  - http://ippsr.msu.edu/public-policy/correlates-state-policy
- Stanford Education Data Archive (2009 to 2018, state, county district)
  - https://purl.stanford.edu/db586ns4974
- HOLC Redlining Maps (1939)
  - https://dsl.richmond.edu/panorama/redlining/

Summing it all up!

Where we are at

Where we need to go

Your role in it all!

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Summing it all up

- Money matters
  - Increasing funding helps, cutting funding hurts!
  - Cuts usually hit low income and minority students first and worst!
  - It costs more to achieve higher standards than lower ones!
- Race is the underlying cause, not just some incidental correlate, of many (if not most) disparities in school funding both within and between states
- A major stepped up federal effort is required for improving equal educational opportunity for all US children, and mitigating racial gaps
  - Only federal dollars, coupled with federal regulatory pressure can mitigate gaps between states
- Problems created on the basis of race require solutions explicitly based on race

Coming together & raising the bar

- There are very few school finance "experts" out there
  - Share your knowledge & expertise
- There are unifying frameworks to guide our field
- There are better and worse, right and wrong ways to evaluate school finance systems
  - Put bluntly – some methods produce more valid results than others
  - Our approaches to designing, reforming and informing state school finance systems should… MUST! be guided by something!
    - The ***Who?*** and ***How Much?*** questions asked by Berne & Stiefel back in day can be guided by relevant methods, leading to empirical answers (or at least reasonable estimates)
- A lot of great stuff, amazing ideas, came long before us!
  - Dig deep in school finance literature to inform your own ideas!

Brilliant stuff from our distant past

- First to conceptualize (as far as I can tell) cost modeling to estimate differences in costs to close outcome gaps in relation to student needs?
  - Garms, W. I., & Smith, M. C. (1970). Educational need and its application to state school finance. *Journal of Human Resources*, 304-317.
  - First in modern wave:
    - Downes, T. A., & Pogue, T. F. (1994). Adjusting school aid formulas for the higher cost of educating disadvantaged students. *National Tax Journal*, *47*(1), 89-110.
- Clever policy solutions to diversify (& stabilize) revenues
  - Ladd, H. F. (1976). State-wide taxation of commercial and industrial property for education. *National Tax Journal*, *29*(2), 143-153.

Brilliant stuff from our distant (and not-so distant) past

- Basis for my unified conceptual/empirical framework here?
  - Duncombe, W., & Yinger, J. (1999). Performance standards and educational cost indexes: you can't have one without the other. *Equity and adequacy in education finance: Issues and perspectives*, *260*, 261.
- Basis for my argument for conditional modeling of spending variation?
  - Berne, R., & Stiefel, L. (1979). Concepts of equity and their relationship to state school finance plans. *Journal of Education Finance*, *5*(2), 109-132.
  - Berne, R., & Stiefel, L. (1994). Measuring equity at the school level: The finance perspective. *Educational Evaluation and Policy Analysis*, *16*(4), 405-421.

Don’t

- Just take weighted averages of spending on the child from a low income family compared to child from non-low income family
  - Within, or between districts
  - Same for race
  - Comparing spending or revenue variation on any one dimension requires accounting for the other dimensions!
- Similarly, don’t just take average spending of high and low poverty schools or districts
  - Same for race
- Compare total district revenues to charter school revenues in fiscal dependent models
  - Even if you subtract pass-throughs and students they go to, districts often pay for services that are rendered to or associated with fiscally dependent charters:
    - Special Education, transportation, enrollment management

Do…

- use funding adequacy measures as covariates instead of less completely adjusted spending measures…

	Dependent Variable	
	Pct. Of Time In Virtual Instruction	
	Spending Model	NECM Adequacy Gap/Surplus Model
Spending per pupil ($10,000s)	0.028*** (0.006)	-
NEMC Adequacy Gap/Surplus per pupil ($10,000s)	-	-0.061*** (0.005)
Enrollment (natural log)	0.048*** (0.002)	-
ELL Pct.	0.283*** (0.028)	-
IEP pct.	-0.112** (0.056)	-
SAIPE Poverty pct.	0.490*** (0.029)	-
Constant	-0.230*** (0.037)	0.347*** (0.029)
N	6655	6823
R-sq.	0.573	0.503

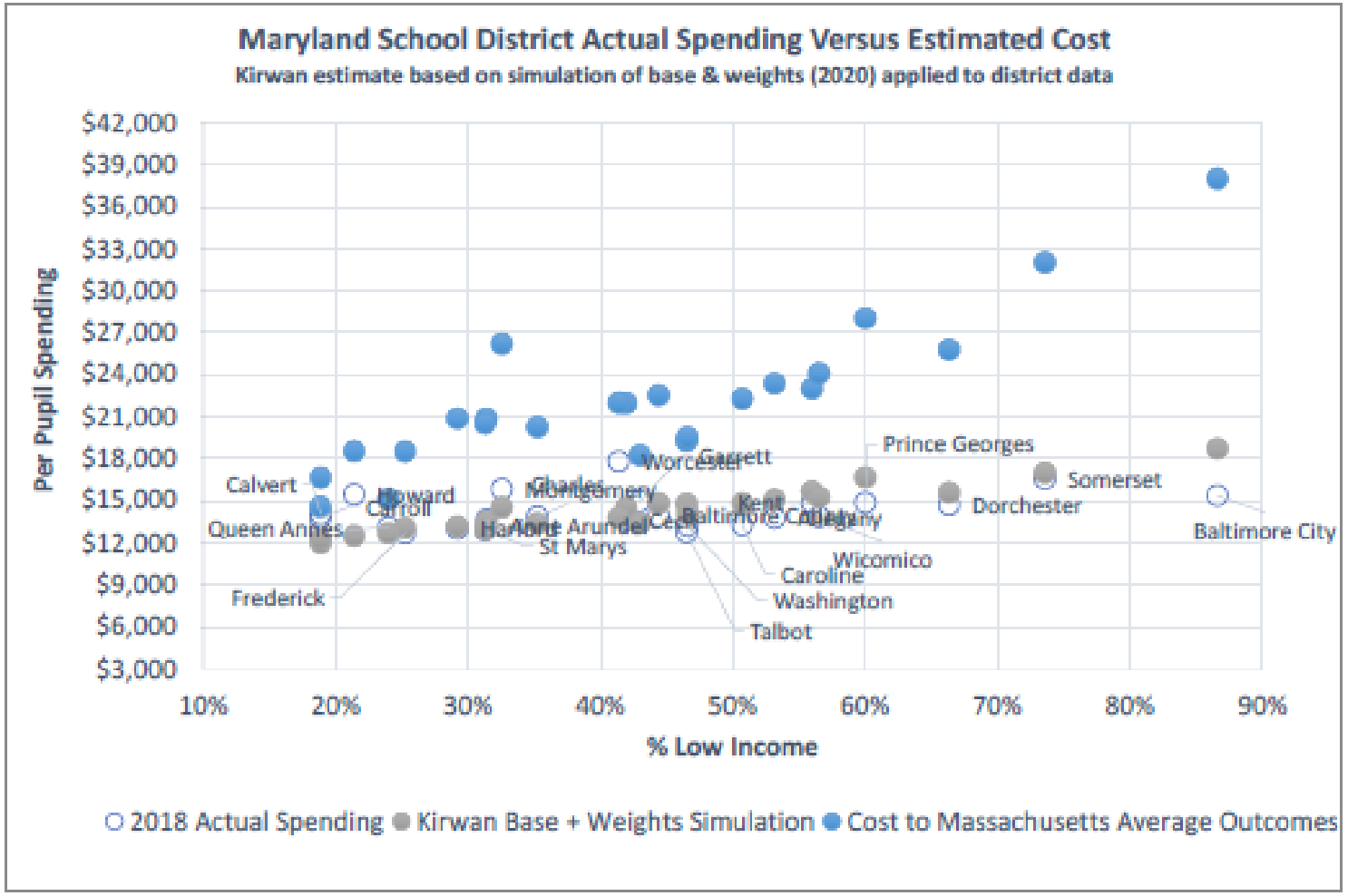
Regression Results: Correlation of Fiscal Measures with Percentage of Student Time in Virtual Instruction

A few additional thoughts

- Don’t be obtuse in describing empirical findings! (and don’t accept “obtusity” as a reviewer) especially those with policy relevance
  - Just say it: Older white populations choose to spend less on schools attended by Black and brown children (find the blunt, clear way to summarize your findings).
- Be willing to distinguish between statistical causation and real world causes (which is the basis of “legal causation”)
  - Sure, statistical modeling can show that there exists an association between redlined locations/spaces in 1939 and school funding gaps in 2018… but… OMG… Correlation isn’t causation!?
  - The reality is that those HOLC maps (and FHA practices) did in fact CAUSE racial disparities in housing values an in turn, in wealth – including the taxable value of those homes decades later – which CAUSES modern day school funding disparities
    - The correlation reveals the presence of an underlying causal mechanism/process, at least in this case.
    - While your models might not “prove causation,” history might!

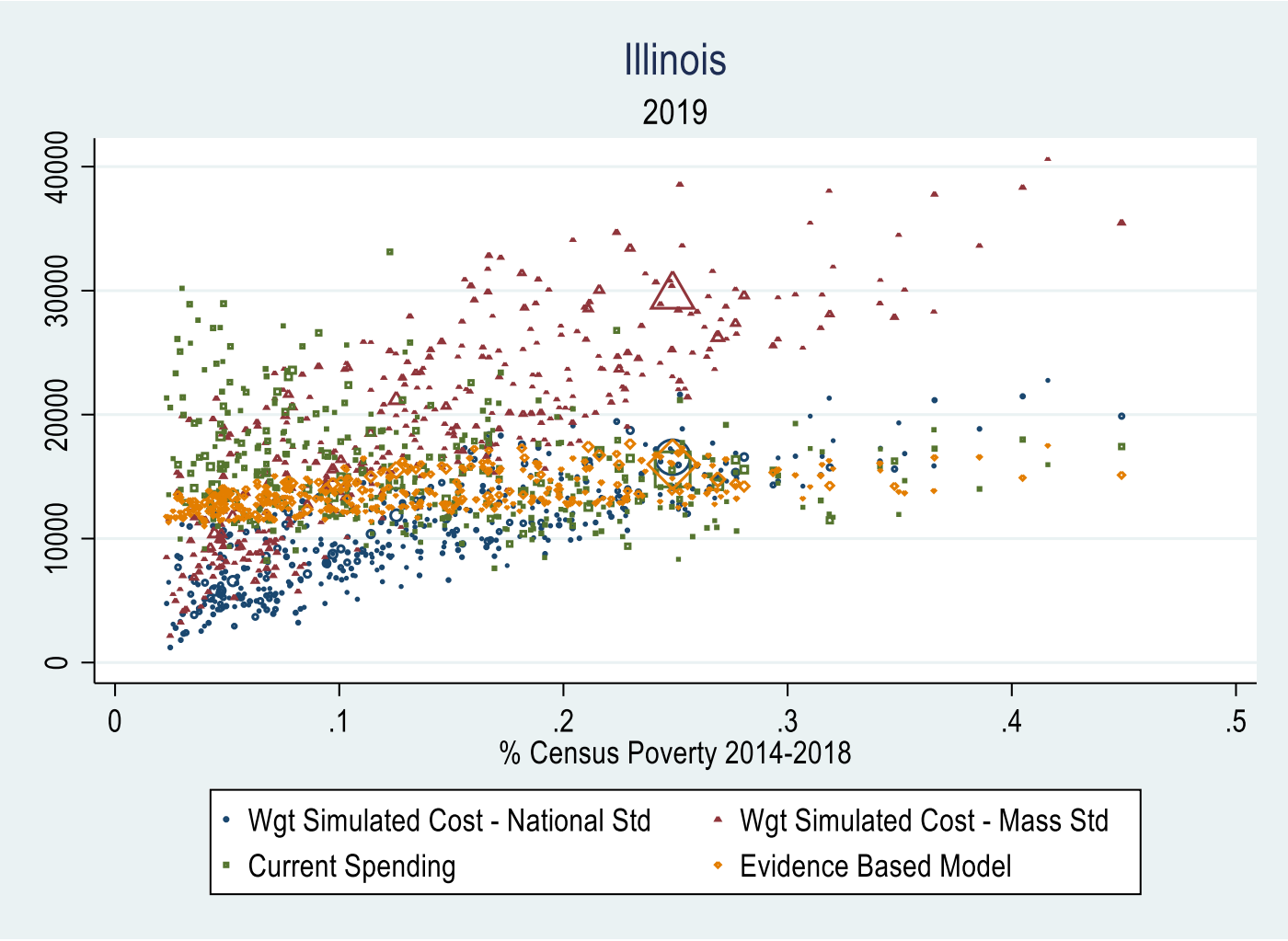
Examples from Other States

Maryland Kirwan/Blueprint



Kirwan/Blueprint spending targets, which are based largely on input oriented analysis, overstate costs and needs in affluent suburbs (Howard County) but understate costs of equal opportunity in Baltimore City.

Illinois "Evidence Based" Model

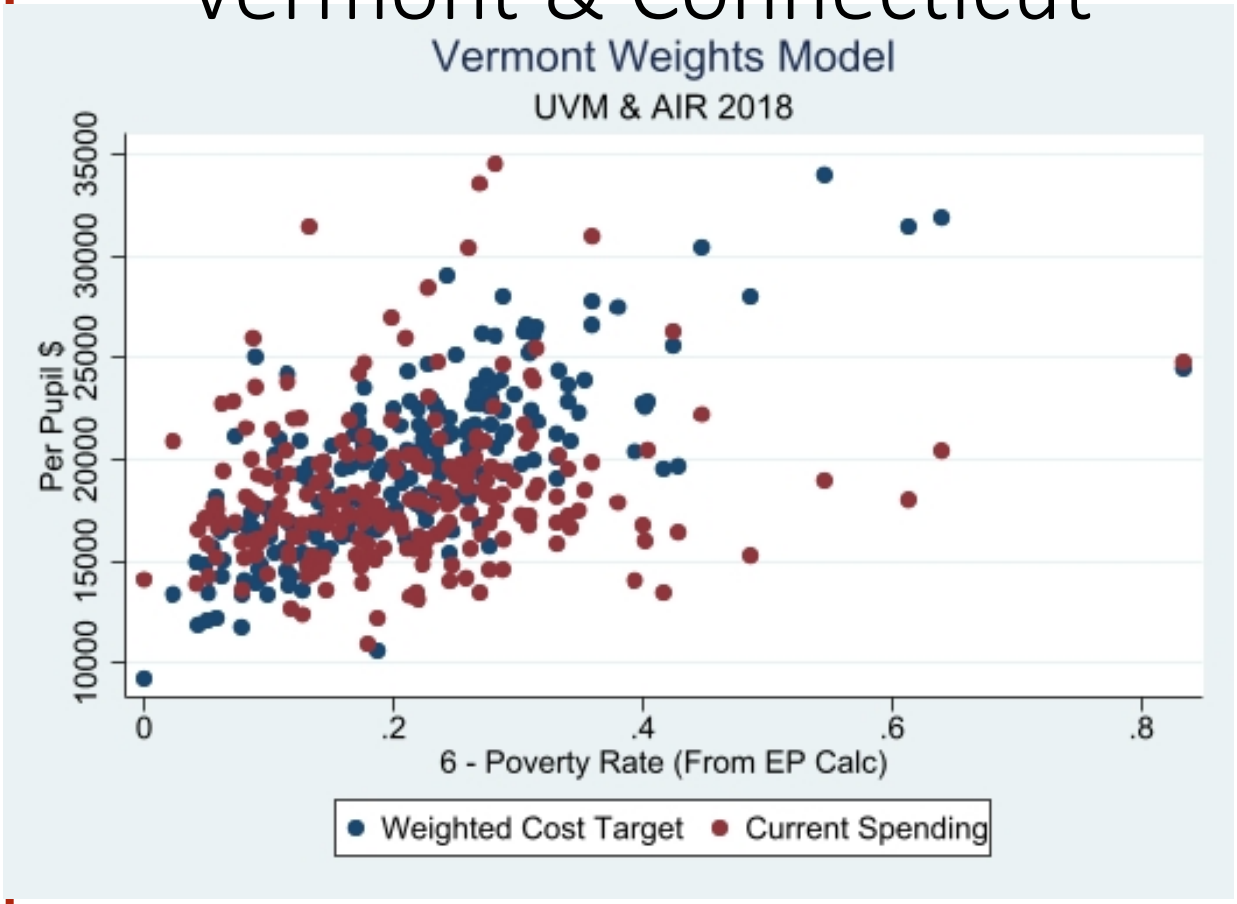


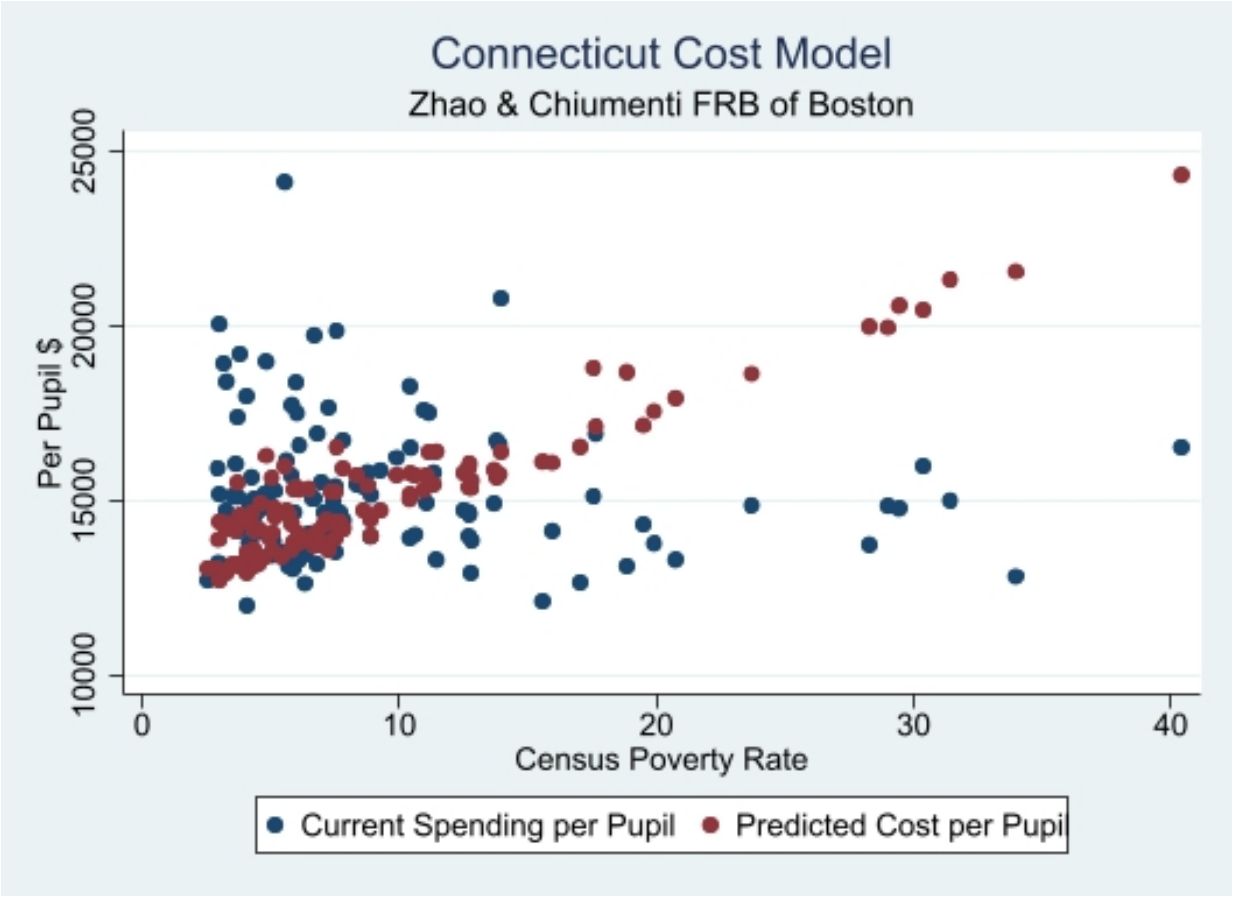
Illinois' new "Evidence Based" school funding model substantially understates the additional costs of providing equal opportunity in high need settings, setting a spending bar for the City of Chicago that is only marginally higher than that of it's most affluent suburban neighbors.

EB Model "effective" weight on % Free or Reduced = .273

Alternative Cost Model Estimates

Vermont & Connecticut

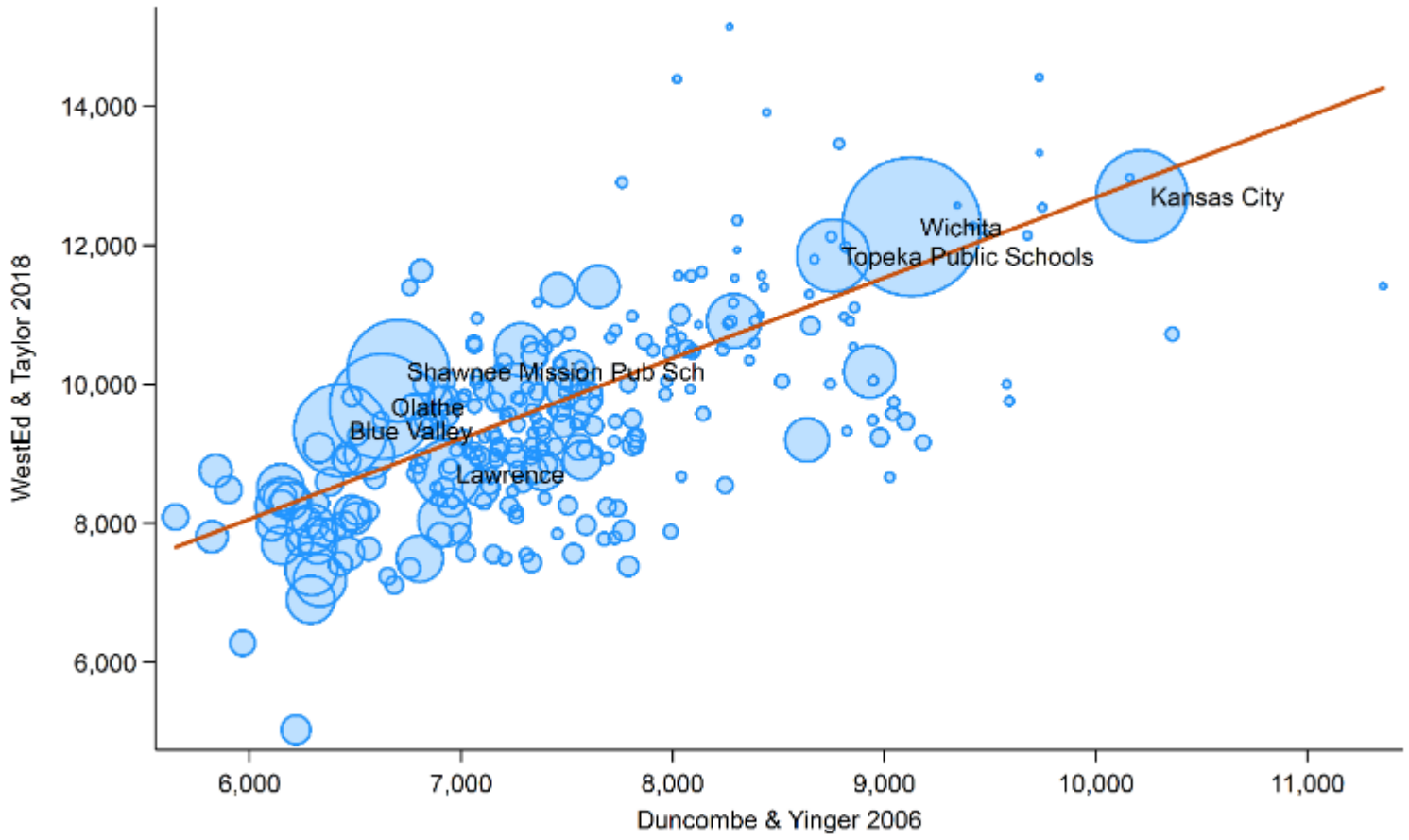




Cost modeling on Connecticut schools by authors from the Federal Reserve of Boston produce similarly strong adjustment for poverty as our own models in Vermont and New Hampshire

Kansas

Figure 1. Comparing Estimated Costs From Two Kansas Cost Studies



Cost model results by two separate authors, 12 years apart, produced similar cost predictions for Kansas public school districts.

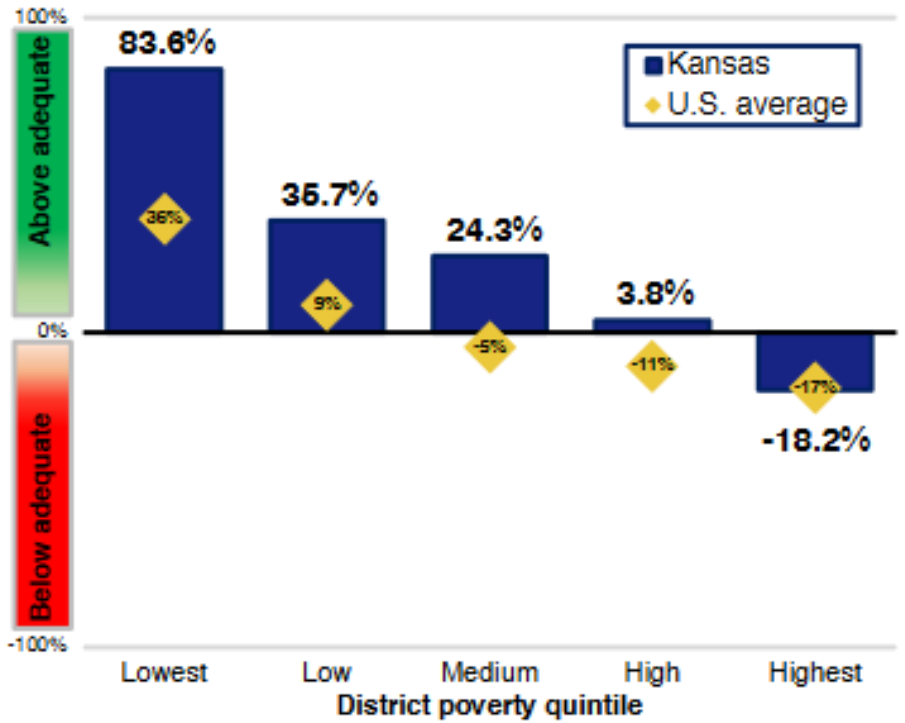
https://carsey.unh.edu/sites/default/files/media/2020/06/20-11882_5._primer_statevignettes_kansas_air_formatted_v5.pdf

Kansas profile

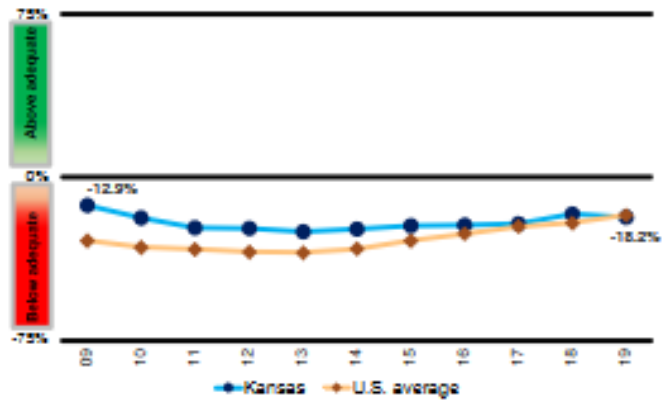
ADEQUACY

Adequacy compares actual per-pupil (PP) spending in each state to cost model estimates of the amount required to achieve U.S. average test scores. These comparisons (% difference) are presented for 2019, by district poverty quintile, in the center graph (the gold diamonds represent U.S. averages).

- Resources in KS's highest poverty districts are below adequate.
- Spending in these districts is $2,669 PP lower than the adequacy target ($14,640), a difference of -18.2%.
- This ranks #24 in the U.S. (out of 49).
- Across the entire state, 29.9% of KS students attend districts with spending below estimated adequate levels.



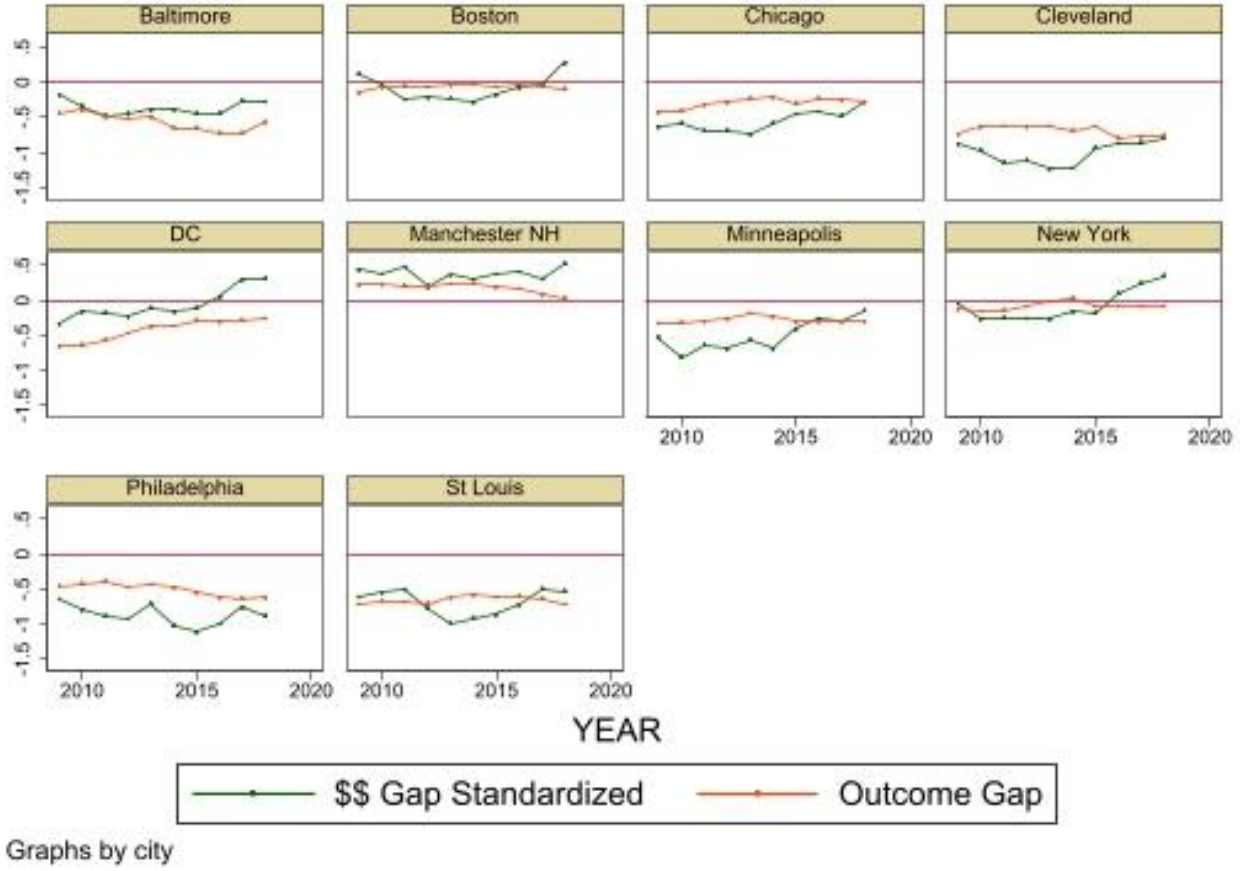
Adequacy trend (pov. Q5), 2009-19



- Adequacy in KS's highest-poverty districts worsened between 2009 (-12.9%) and 2019 (-18.2%).
- During this period, U.S. average adequacy in these districts (orange line) improved from -29.1% to -17.3%.

Regarding funding adequacy, Kansas has done better than many other states including Tennessee, due in part to a combination of judicial pressure, empirical evidence and legislative responsiveness.

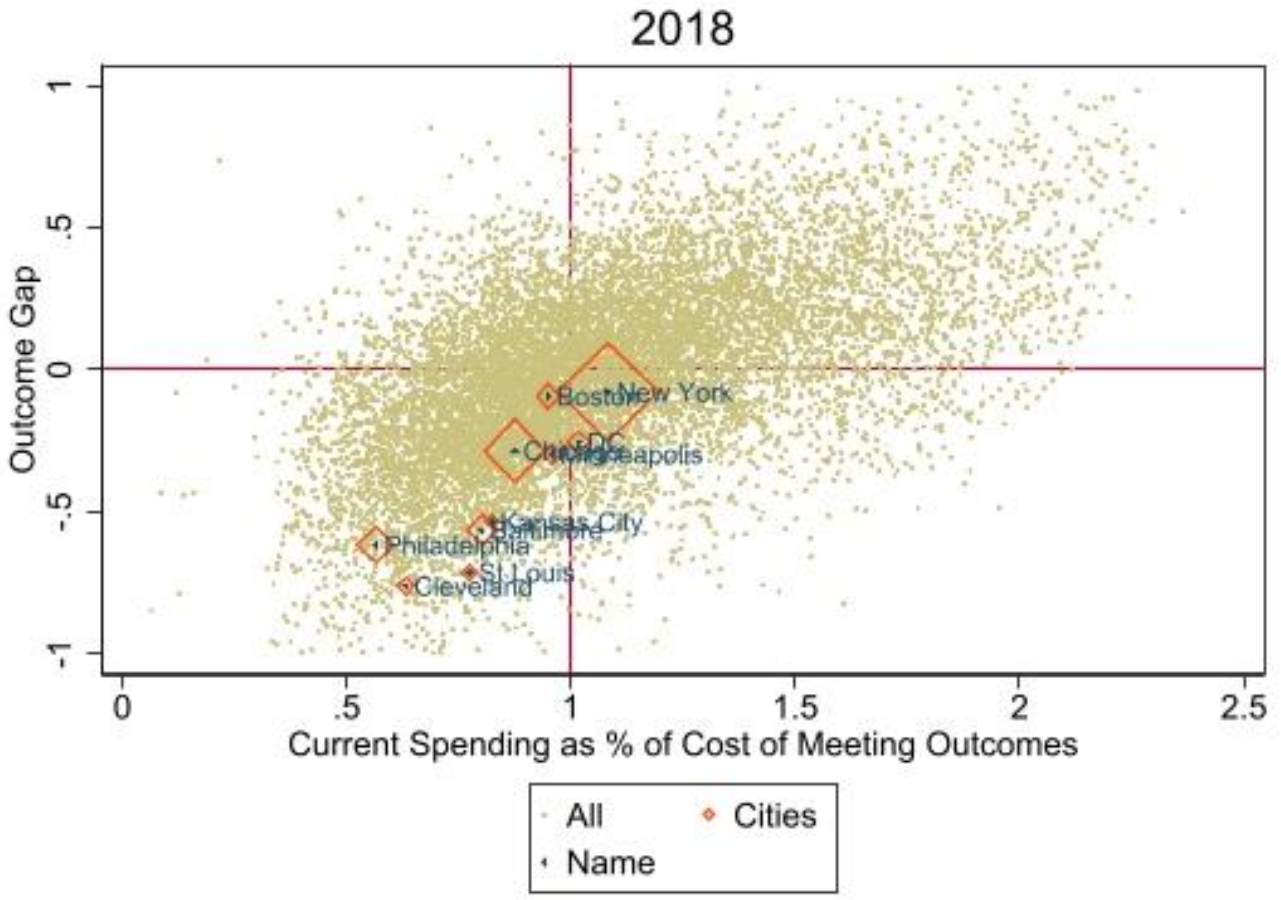
Adequacy and Outcomes in Select Cities



Cities with more adequate funding tend to have higher outcomes and cities where funding adequacy has improved over time have seen improved outcomes.

Note: NYC outcome data unavailable after 2015

Adequacy and Outcomes in Select Cities



Cities with more adequate funding tend to have higher outcomes.

Note: NYC outcome data unavailable after 2015 (outcome gap based on 2015 data)