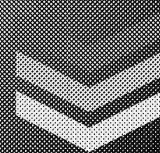


# Connecticut's Education Cost Sharing Formula: An Update



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**PLAINTIFFS'  
TRIAL EXHIBIT**

No. 307 FHD-CV14-5037585-S

731



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## **1.0 Introduction**

This report provides an update to my original report submitted in October of 2011 coauthored with Robert Bifulco of Syracuse University. Also included in this report are findings and conclusions provided in my more recent (Winter 2013) rebuttal to the state's motion to dismiss the present case. In our 2011 report, Robert Bifulco and I laid out the following major claims.

1. That the features of the Education Cost Sharing formula were not derived rationally and as a result have little relationship to the costs of providing equal educational opportunity to achieve adequate educational outcomes.
2. That the Education Cost Sharing Formula fails to provide equal and adequate educational opportunities, substantially disadvantaging children attending high need school districts.
3. That several school districts serving very high need populations have large funding gaps and that those funding gaps are associated with deficits in essential schooling resources including reasonable class sizes, and competitive teacher wages.
4. Districts with large funding gaps have significant outcome deficits.

Much of the financial data used in the 2011 report extend through 2008 or 2009. Since that time, state data on Education Cost Sharing allotments are available through 2013-14 and on other school resources and outcomes through 2012-13.

But, no substantive changes have been made to the design of the Education Cost Sharing formula. Little funding has been added to that formula. As such, there is little reason to expect that conditions for children attending districts identified as facing severe fiscal disparity in 2008 have seen any improvement in their relative or absolute position.

## **2.0 Changes to ECS funding are trivial and do not substantively alter the distribution of opportunities for Connecticut school children**

I begin this section with a review of data and statements I presented in response to the state's motion to dismiss in February of 2013. I conclude this section by considering an additional year of data released since that time.

The affidavit of Brian Mahoney in support of the state motion to dismiss indicated that ECS entitlements in 2012-13 were approximately \$50 million over 2011-12. Mahoney's affidavit suggested that approximately 80% of that amount went to alliance districts.

This claim would be perhaps carry some weight if it was actually the case that a) substantive funding was added to high need districts and/or b) the funding was sufficient to alter the relative adequacy of funding to these districts or equal opportunity provided to children in these districts as originally critiqued in my report with Robert Bifulco. However, the additional funding is trivial and does little or nothing to alter either the relative adequacy of funding or equal educational opportunity.

### **What we showed in our 2011 report**

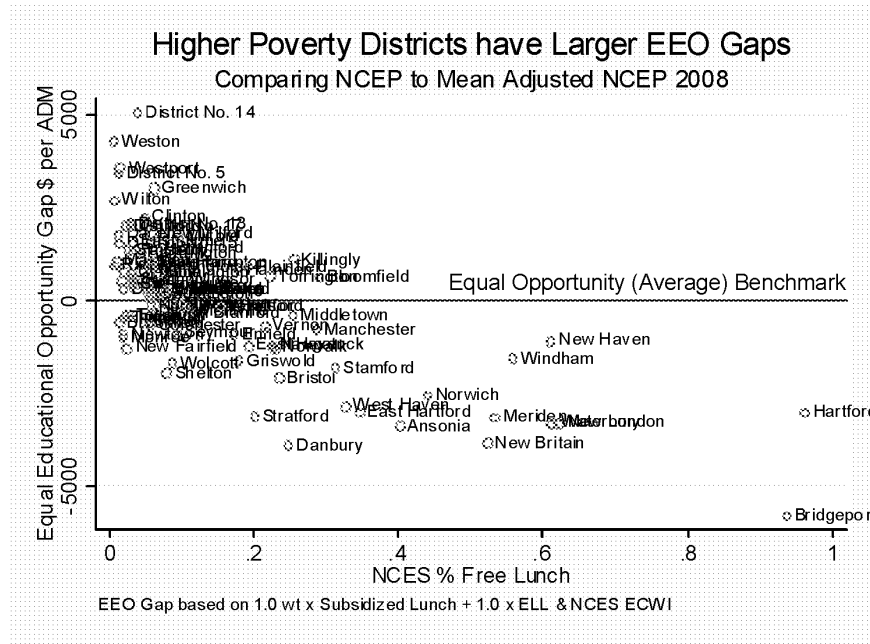
In our October 2011, report Robert Bifulco and I evaluated the equal educational opportunity and adequacy of Net Current Expenditures of Connecticut school districts through the year 2007-08. Nominal net current expenditures are simply the reported (by the Connecticut Department of Education) current spending levels, per pupil in average daily membership. In our original report, we applied adjustments for the costs of serving children with different needs across districts.

In one set of analyses, we benchmarked *equal educational opportunity* against the average district's need adjusted net current expenditures. That is, to evaluate *equal educational opportunity*, we compared the resources of each district statewide to those of the average district – the district likely to be achieving current average outcomes, with average students and average resources. In a second set of analyses, we benchmarked *educational adequacy* against estimates of adequate spending levels from an earlier report by Augenblick and colleagues.

Figure 2.4 from our original report displays our findings from that analysis. What we found was that after adjusting for differences in student needs and costs of education, Connecticut's high poverty districts had substantially fewer resources than lower poverty ones and that many high poverty districts had the equivalent of \$3,000 to \$5,000 less per pupil than the "average" district. Beyond the overall pattern of gaps, we also see that districts including Bridgeport, New Britain, Meriden and New London are particularly disadvantaged even when compared with other districts having similar concentrations of low income students.



Figure 2.4 Baker & Bifulco Report, Page 54



We also compared earlier years of expenditure data to estimates of cost prepared by Augenblick and associates. Figure 2.10 shows our findings from that analysis. In Figure 2.10 we compare the funding gaps with respect to Augenblick estimates, arranged by low income concentration. The pattern is unsurprisingly similar to that in Figure 2.4. Funding gaps with respect to adequacy targets mirror the funding gaps with respect to the “average” district. Further, the highest need districts have funding gaps exceeding \$5,000 per pupil at that time, including handful of very high need districts: Bridgeport, Waterbury and New Britain.

Figure 2.10 Baker & Bifulco Report, Page 54

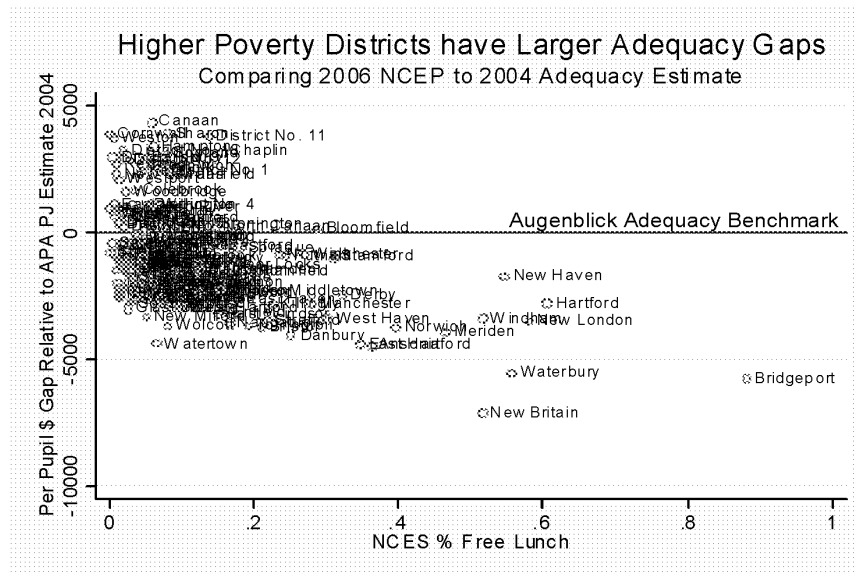


Figure 2.4 and Figure 2.10 from our original report, taken together show that the Education Cost Sharing Formula, as implemented through 2007-08 failed to provide sufficiently targeted resources to guarantee equal educational opportunity, or educational adequacy especially for children attending the state’s highest need districts – those with high concentrations of low income children and children with limited English language proficiency.

Two issues are worth noting with respect to the original Augenblick study. First, as we discussed in our original report (pages 114 to 116), the variable student need weights derived in the study ranged from relatively low to relatively high among cost studies performed in the late 1990s and early 2000s. But these need weights precede a) continued demographic change in many Connecticut school districts and b) increases in outcome standards. Increased outcome standards, when assessed, typically reveal even greater disparities in outcomes by student need. Greater disparities in outcomes by socioeconomic status warrant even greater additional support. That is, larger need weighting. In other words, bigger gaps take more effort to close and thus more resources. That said, even when applying the weighting scheme of the earlier Augenblick study, we found that severely underfunded school districts have funding gaps from \$3,000 to over \$5,000 per pupil when compared to the “average” (not “adequate”) Connecticut school district.

Second, achieving higher outcome standards generally costs more than achieving lower standards. We pegged our original equal opportunity analysis to the average Connecticut school district in 2008. It remains to be seen whether the current average Connecticut school

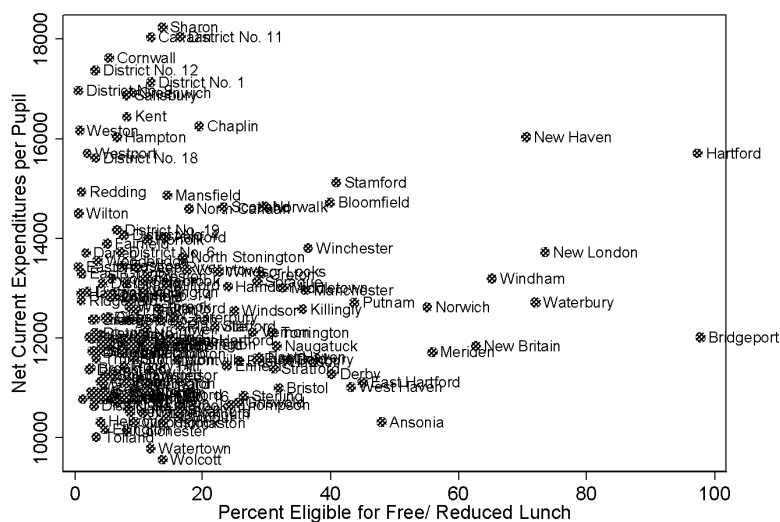
district, after years of lagging funding, will perform adequately on newly adopted standards. That is, are the outcomes of the average Connecticut school district in 2008 “adequate” by today’s standard? If the current average Connecticut school district falls short of standards now considered adequate, our previously estimated equal opportunity shortfalls understate the “adequacy” funding gaps faced by the most severely underfunded school districts.

### Have Recent Changes in ECS Aid Improved Equal Opportunity or Adequacy?

Figure 1 shows the distribution of nominal Net Current Expenditures per pupil (in average daily membership) for 2007-08. These are the spending levels without cost and need adjustment and prior to comparison against a particular benchmark (average, or adequate). We can see in Figure 1, for example, that Bridgeport, Waterbury, New Britain and Meriden have relatively low Net Current Expenditures compared either to all districts, or even when compared to other districts with high concentrations of lower income students (where Hartford and New Haven’s reported NCEP are distorted by the role of magnet funding). Figure 1 serves as a baseline for comparing the effect of recent funding changes on this distribution.

**Figure 1**

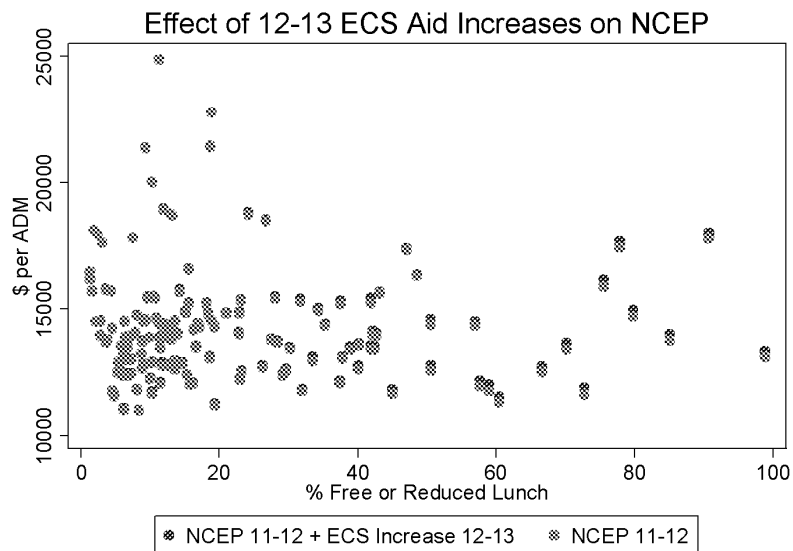
Distribution of Nominal 2007-08 Net Current Expenditures per ADM







**Figure 3 (excludes names)**



**Figure 4**

**Plaintiff Districts**

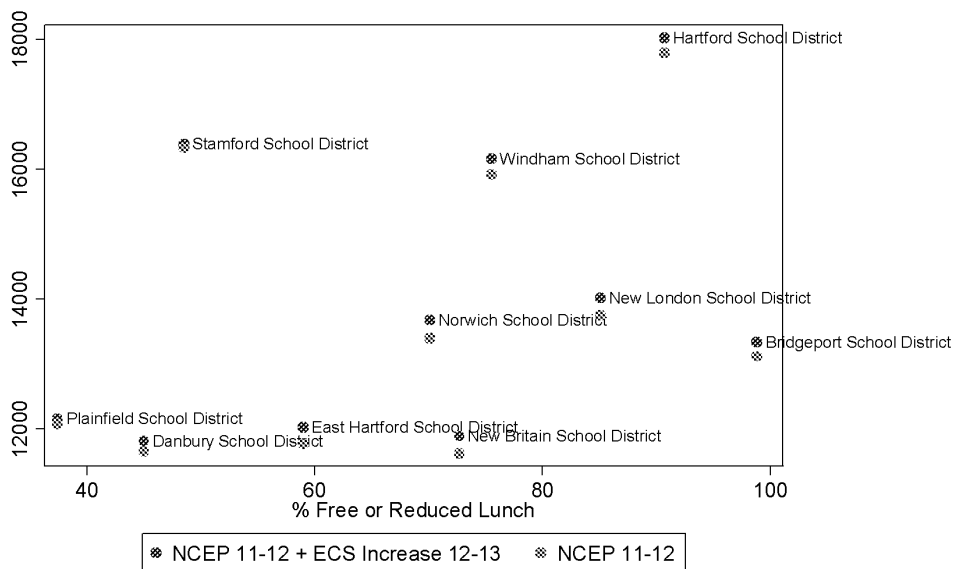


Table 1 includes NCEP for 2011-12 and the actual aid increases for 2012-13 (divided by ADM for 11-12), for Alliance Districts which include several high need districts and those high

need districts Robert Bifulco and I identified as severely underfunded. I have also expressed the ECS aid increase as a percent increase over NCEP 2011-12. Most increases were less than \$200 per pupil and well less than 2%. I have chosen Alliance districts in part because this group does include several high need districts, but also because affidavits provided on behalf of the state suggest that adopted reforms and funding changes substantially alter opportunities for children in these specific districts. Quite clearly, they do not.

At the current pace of ECS entitlement increases it would take over 20 years to close the greater than \$5,000 gaps in equal opportunity or adequacy identified in our earlier report. By that point, the gaps would have grown even larger.

**Table 1**

**Alliance District Spending, Aid Increases & ECS Funding Gaps**

Town	NCEP '11-12[1]	Increase per ADM 12-13[2]	% Increase
ANSONIA	\$11,333	\$199	1.76%
BLOOMFIELD	\$17,343	\$86	0.50%
<b>BRIDGEPORT[3]*</b>	<b>\$13,121</b>	<b>\$211</b>	<b>1.61%</b>
BRISTOL	\$12,619	\$161	1.28%
<b>DANBURY*</b>	\$11,655	\$160	1.37%
DERBY	\$12,586	\$178	1.42%
<b>EAST HARTFORD*</b>	\$11,771	\$211	1.79%
EAST HAVEN	\$13,386	\$133	1.00%
EAST WINDSOR	\$14,920	\$123	0.82%
HAMDEN	\$15,200	\$130	0.86%
<b>HARTFORD*</b>	\$17,793	\$228	1.28%
KILLINGLY	\$13,997	\$149	1.07%
MANCHESTER	\$14,404	\$185	1.29%
<b>MERIDEN[3]</b>	<b>\$12,527</b>	<b>\$194</b>	<b>1.55%</b>
MIDDLETOWN	\$13,396	\$150	1.12%
NAUGATUCK	\$13,389	\$134	1.00%
<b>NEW BRITAIN[3]*</b>	<b>\$11,630</b>	<b>\$241</b>	<b>2.07%</b>
NEW HAVEN	\$17,475	\$213	1.22%
<b>NEW LONDON[3]*</b>	<b>\$13,757</b>	<b>\$231</b>	<b>1.68%</b>
NORWALK	\$15,637	\$51	0.33%
<b>NORWICH*</b>	\$13,404	\$190	1.42%
PUTNAM	\$14,376	\$143	1.00%
STAMFORD	\$16,331	\$60	0.37%
VERNON	\$12,960	\$179	1.38%
<b>WATERBURY[3]</b>	<b>\$14,711</b>	<b>\$251</b>	<b>1.70%</b>
WEST HAVEN	\$11,950	\$191	1.60%
WINCHESTER	\$15,232	\$155	1.02%
<b>WINDHAM*</b>	\$15,918	\$234	1.47%
WINDSOR	\$15,424	\$75	0.49%



Town	NCEP '11-12[1]	Increase per ADM 12-13[2]	% Increase
WINDSOR LOCKS	\$15,278	\$136	0.89%
[1] Source: 2011-12 Net Current Expenditures (NCE) per Pupil (NCEP) (November, 2012) [2] Source: Education Cost Sharing (ECS) Entitlements (January, 2013), Difference between 11-12 & 12-13 divided by ADM 11-12 (NCE worksheet) [3] Identified in Baker/Bifulco report as being severely underfunded *Plaintiff district			

While affidavits provided on behalf of the state suggest that additional funding is available to these districts to aid in their implementation of specific reforms, those affidavits provided no evidence that such funding is guaranteed in amounts that would substantively alter equity or adequacy of funding. Further, neither those discretionary funding increases associated with specific reform proposals, nor the trivial increase in aid provided through ECS were based on any analysis of the actual needs of Connecticut school districts.

Recent adjustments to the funding formula provided more significant increases in aid to charter schools. At best, these increases fail to alter the distribution of opportunities to Connecticut schoolchildren. More likely, they in fact exacerbate disparities. Charters serve a relatively small share of the total student population. Most children in high need districts remain in district schools that saw negligible increase in funding. In that sense, charter funding increases have limited effect.

But, as it turns out, many of the charter schools in high need districts that received the greater increases in funding actually serve much lower need student populations (See Attachment Table A1). Further, after removing district expenditures on transportation and special education (expenses for which host districts are primarily responsible), many charters already substantially outspent district averages (see Attachment Table A2).<sup>1</sup> In short, increasing funding to charters which already outspent host districts while cream-skimming lower need students, exacerbates rather than moderating disparities in opportunity.

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<sup>1</sup> Not accounted for here are potential differences in facilities operation & lease costs. It is often argued that the costs of facilities are particularly high for charter schools, consuming large shares of their budgets, while facilities are “free” for public districts. In reality, one can expect facilities leases for Connecticut charter schools to range from \$1,500 per pupil to around \$2,000 per pupil (which is indeed significant) and one can expect annual maintenance and operations (not including long term debt expense) for districts to be around \$1,400 per pupil (in 2010 based on CTDOE Data). The state’s choice to provide substantially increased funding for charter schools and not to host district schools was not based on any thorough analysis of actual differences in costs or needs.

## Another Year of Data on ECS Increases Makes Little Difference (ECS 13-14)

As noted above, the funding changes and their resulting effect on the distribution of opportunities to Connecticut children were trivial between 2011-12 and 2012-13. Aggregate changes in funding were similar between 2012-13 and 2013-14 and were similarly distributed. Thus, they too are trivial. Figure 5 shows the ECS 2012-13 and 2013-14 funding increases per pupil (in ADM) with respect to concentrations of low income children. Prior year funding increases for the highest need districts were around \$200 per pupil. For the current year, some of those increases rise toward \$400 per pupil. But again, the initial funding gaps were in some cases over \$5,000 per pupil. Thus even if costs did not increase over time, leaving those initial gaps constant, recent increases would only chip away at the margins of those gaps.

Figure 5

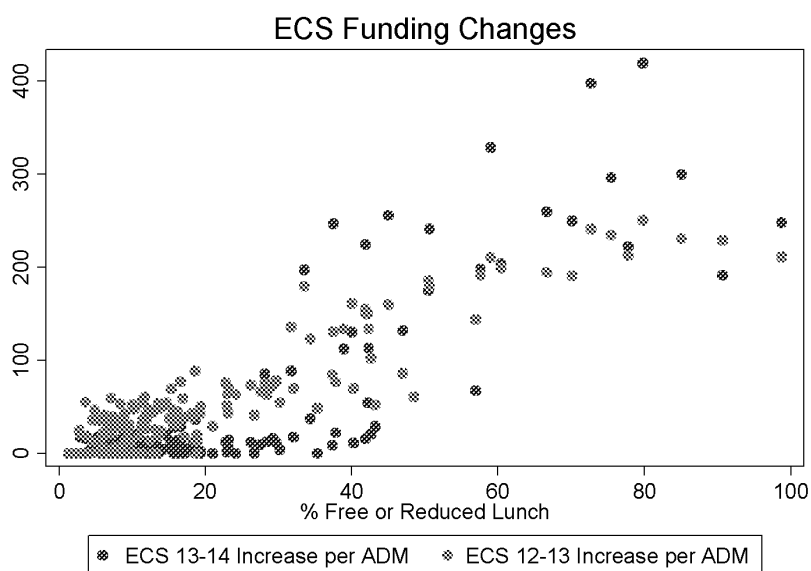


Figure 6 and Figure 7 reveal a logical result of the very small increases in state support. While the increases in state aid are greater for higher need districts, they are so small that they lead to only slight increases in resulting per pupil spending. Per pupil spending or Net Current Expenditure data are available only through 2012-13, and thus reflect the previous increases in ECS aid. State proposed increases for 2014-15 appear similarly meager to increases

of the past two year, with Bridgeport, for example, poised to receive an approximate 2.36% increase.<sup>2</sup>

Figure 6 shows that those increases in ECS aid had little or no effect on the distribution of opportunities across Connecticut children. Worse, it would appear in Figure 6 that while high poverty districts experienced some marginal increases in per pupil spending evidenced by orange dots that in some cases are marginally higher than green dots, it also appears that many low poverty districts, as a function of increased local revenues made even greater gains.

Figure 6

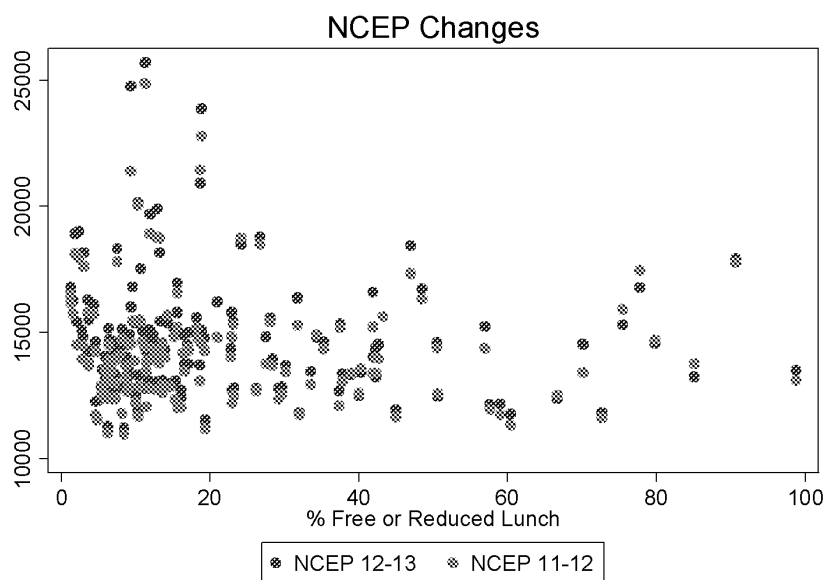


Figure 7 shows the current year and prior year increases in ECS aid. Increases in ECS aid were appropriately most targeted to the neediest districts. Those we had previously identified as severely underfunded received last year and this, the greatest, albeit trivial, per pupil increases in ECS aid. Alliance districts which are generally needy districts also received around \$200 per pupil, as did the subset of those districts identified as plaintiff’s districts. Other districts received very little aid increase.

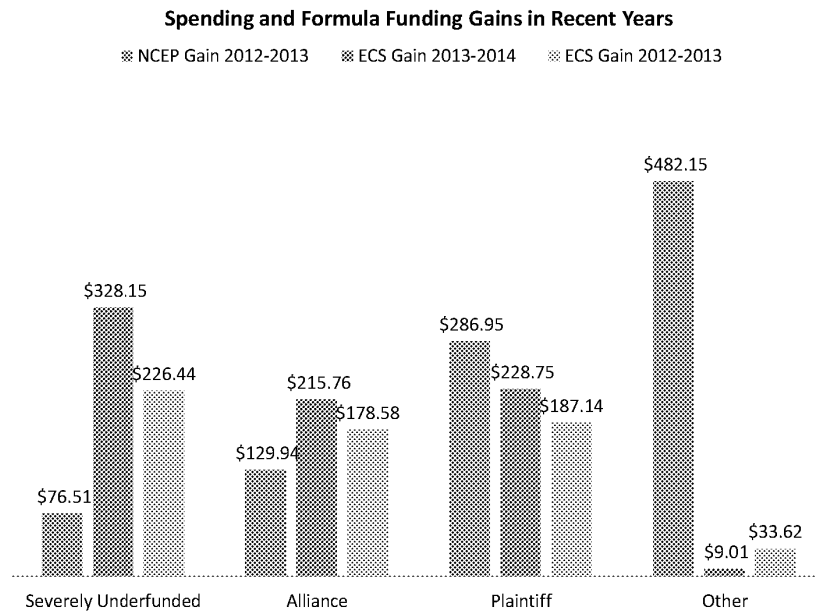
But, because these aid increases are so trivial, districts have responded by increasing their local revenues to keep up with increased costs and lower poverty districts have much greater capacity on average to increase their local revenues. The result is that lower poverty districts increased net current spending by nearly \$500 per pupil between 2012 and 2013, compared to

<sup>2</sup> Projected ECS entitlement for Bridgeport is \$177,823,968 (2014-15) compared to \$173,724,236 (2013-14).



under \$100 for higher poverty districts. What this means is that despite the targeting of ECS aid to higher need districts, current spending disparities continue to get worse, not better.

**Figure 7**



These patterns of spending change, resulting from lagging state aid growth threaten to re-establish classic patterns of wealth related disparity in school funding originally addressed in the 1977 *Horton I* decision. Pages 9 to 11 of that decision explored the role of substantial variations in local taxable property wealth in determining variations in per pupil spending. In that decision, the court noted:

“Because local property taxes are the principal source of revenue for local public schools, a significant measure of the ability of the various towns to finance local education is the dollar amount of taxable property per pupil in each town which can be figured by dividing the grand list of a town by the number of pupils.FN10 For the 1972-73 school year, wide disparities existed in the effective yield per pupil ranging from approximately \$20,000 per pupil to approximately \$170,000 per pupil. During that year, the state average was \$53,639. In Canton, it was \$38,415.” (p. 9)

Further, a few pages later, the court concluded:

“The wide disparities that exist in the amount spent on education by the various towns result primarily from the wide disparities that exist in the taxable wealth of the various towns; the present system of financing education in Connecticut ensures that, regardless of the educational needs or wants of children, more educational dollars will be allotted to children who live in property-rich towns than to children who live in property-poor towns.” (p. 11)

In Connecticut, local revenues remain the principle source of school revenues (see Table 2) and the state share (as of the most recent federally available data 2010-11) for Connecticut remains lower than other similar northeastern states.

**Table 2**

	Federal sources			State sources		Local sources			
	Total	Total	Title I	Total	General Formula Assistance	Total	Taxes and parent government contributions	Other local governments	Charges
<b>Connecticut</b>	100.0	8.3	1.4	<b>33.1</b>	13.5	58.6	52.8	4.2	1.3
<b>Massachusetts</b>	100.0	7.8	1.5	<b>37.9</b>	25.2	54.2	44.1	6.7	2.0
<b>New Jersey</b>	100.0	5.1	1.4	<b>36.9</b>	21.9	58.1	52.6	1.0	2.4

Source: Table 5, [http://www2.census.gov/govs/school/elsec11\\_sttables.xls](http://www2.census.gov/govs/school/elsec11_sttables.xls)

Table 3 shows that the state share of support for schools in Connecticut has declined steadily since 2008. Notably, the most recent two years of these data include federal aid intended to substitute for lost state general aid (Fiscal Stabilization Aid). But that aid has not been since restored.

**Table 3<sup>3</sup>**

	Federal sources			State sources		Local sources			
	Total	Total	Title I	Total	General Formula Assistance	Total	Taxes and parent government contributions	Other local governments	Charges
<b>2010-11</b>	100.0	8.3	1.4	<b>33.1</b>	13.5	58.6	52.8	4.2	1.3
<b>2009-10</b>	100.0	8.6	1.7	<b>33.9</b>	13.5	57.5	51.8	4.1	1.4
<b>2008-09</b>	100.0	4.2	1.2	<b>38.0</b>	15.8	57.8	52.1	4.1	1.4
<b>2007-08</b>	100.0	4.2	1.2	<b>38.5</b>	15.6	57.3	51.5	4.0	1.6

Source: Table 5, [http://www2.census.gov/govs/school/elsec11\\_sttables.xls](http://www2.census.gov/govs/school/elsec11_sttables.xls)  
 Table 5, [http://www2.census.gov/govs/school/elsec10\\_sttables.xls](http://www2.census.gov/govs/school/elsec10_sttables.xls)  
 Table 5, [http://www2.census.gov/govs/school/elsec09\\_sttables.xls](http://www2.census.gov/govs/school/elsec09_sttables.xls)  
 Table 5, [http://www2.census.gov/govs/school/elsec08\\_sttables.xls](http://www2.census.gov/govs/school/elsec08_sttables.xls)

Indeed, a well-targeted aid formula, even in a state where funding is dominated by local sources, can achieve reasonable degrees of equity as in Massachusetts and New Jersey. But, Connecticut’s aid formula is not as well targeted as in these other states and there are limits to the equity that can be achieved as the state role dwindles to very low levels.

Table 4 shows the differences in current spending growth for Alliance, Severely underfunded and “Other” districts alongside their 2012 mill rates and taxable property wealth expressed as Equalized Grand List per Capita. This table reveals evidence of classic wealth related disparities in tax rates and spending increases, even when casting a wide net of “other” districts rather than comparing disadvantaged districts to affluent districts. Alliance Districts and Severely underfunded districts show much smaller recent increases than “other” districts in net current spending. Alliance Districts and Severely underfunded districts already have higher average mill levies and lower taxable property wealth on which to draw.

**Table 4**

Group	NCEP Gain 12-13	Mill Rate 2012	EGL/Capita 2012	EGL/Pupil 2012
<b>Alliance</b>	\$130	34.25	\$105,199	\$803,568
<b>Other</b>	\$482	24.52	\$189,736	\$1,152,366
<b>Severe</b>	\$77	37.47	\$60,354	\$407,159

Municipal Fiscal Indicators from: <http://www.ct.gov/opm/cwp/view.asp?A=2984&Q=383170>  
 EGL from spreadsheet: FISCIN12, column (AP)

<sup>3</sup> The state’s own reports of state share indicate a higher level of state share, but indicate a similar pattern of declining state share for fy10 & fy11. The state’s reports indicate a rebound to fy08 (42.3%) levels by fy13 (42.9%, preliminary). Federal data do not yet reveal this rebound.



Table 5 shows the result of the most recent current spending changes with respect to taxable property wealth. Earlier school finance litigation including Horton I evaluated *fiscal neutrality* of state school finance systems, often using measures such as correlations between spending and taxable property wealth across school districts, where positive correlations indicated that higher property wealth districts had higher average spending. Table 5 illustrates that even the single year disparate changes in net current spending between 2011-12 and 2012-13 have led to increased positive correlations between spending and wealth.

Indeed, it stands to reason that if the increases were driven by wealth, they would contribute to wealth related disparities. And they do. In 2012-13, the correlation between each taxable property wealth measure (per capita or per pupil) and current spending is marginally higher than it was the previous year. That is, fiscal neutrality is eroding, even with, or more likely as a result of the paltry increases to state aid.

**Table 5**

	<b>NCEP 11-12</b>	<b>NCEP 12-13</b>
<b>Equalized Grand List per Pupil</b>	0.444	0.461
<b>Equalized Grand List per Capita</b>	0.424	0.456

Note: Weighted for district enrollment

### **3.0 The Lack of Substantive Changes in Funding Distribution Coincides with Lack of Substantive Changes in Distribution of Essential Resources**

In our 2011 report, Robert Bifulco and I illustrated that the most severely fiscally disadvantaged local public school districts in Connecticut also had class sizes that were inappropriately and inequitably large and teacher salaries that were lower than other districts for teachers of comparable characteristics. Competitive wages for teachers and reasonable staffing to pupil ratios depend on equitable and adequate funding. As such, it stands to reason that if funding equity has not been improved, and may in fact have eroded further, and funding adequacy has not been improved, then the level or distribution of resources dependent on funding likely have not improved either.

#### **Class Size**

The next several figures use updated information from the Connecticut Department of Education on class sizes, new teachers, teacher experience and comparative salaries from 2007-08 through 2012-13.

Figure 8

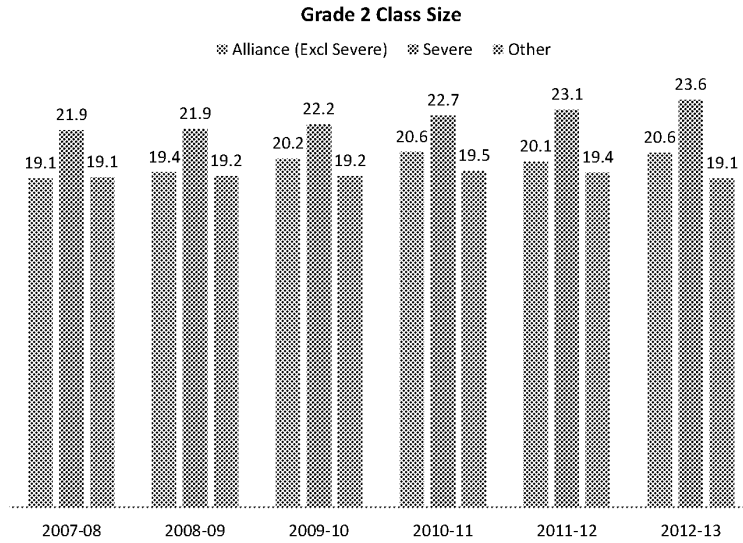


Figure 8 shows that at the second grade, schools in severely underfunded districts had larger class sizes in 2007-08 than either alliance district schools on average or other schools statewide. Class sizes in severely underfunded districts have continued to climb and by 2012-13 remain the highest. Alliance district class sizes are also climbing, but class sizes of schools in “other” districts are remaining stable. Class size disparities are getting worse, not better.

Figure 9

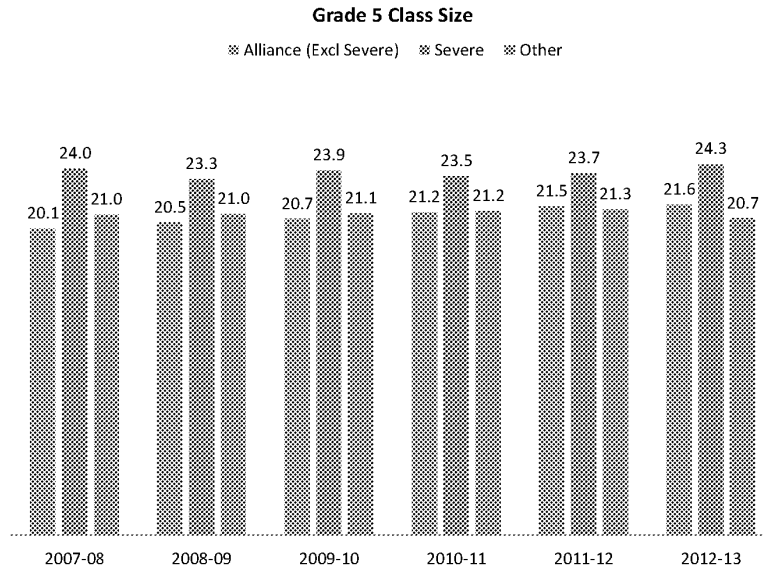
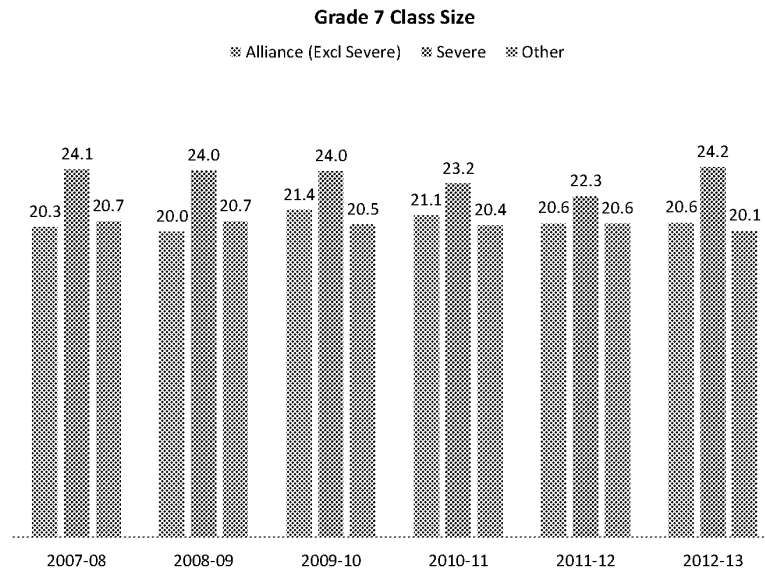


Figure 9 shows Grade 5 class sizes over time by group. As with second grade, the students who most need smaller class sizes are again subjected to the largest class sizes. Severely underfunded high need districts have the largest class sizes, consistently over time. On average, schools in Alliance districts have class sizes consistent with “other districts.” But, even in this case it should be noted that because of the greater needs of children in Alliance districts, smaller class sizes would provide more equal educational opportunity.

**Figure 10**



Patterns in Figure 10 are similar. Again, schools in districts that are severely underfunded have the largest class sizes and while those class sizes decreased temporarily, they again increased and remain larger in 2012-13.

### Teacher Characteristics and Salaries

Figure 11 tells a more complex story. Unfortunately, since the state has removed individual level teacher data from the CEDaR web site, calculations in this and the next few graphs are made based on district aggregate information. I am unable to determine the share of “novice” (first 2 or 3 years) teachers as a result. The share of new teachers is consistently highest in charter schools. But the share of new teachers was also high in the mid-2000s in Alliance and severely underfunded districts. Because many of these districts are not growing in total enrollment these elevated rates of new teachers are likely a function of high turnover. Notably, numbers of new teachers have declined especially in severely underfunded districts in recent years. This likely occurs since these districts lack the resources to hire new teachers.



**Figure 11**

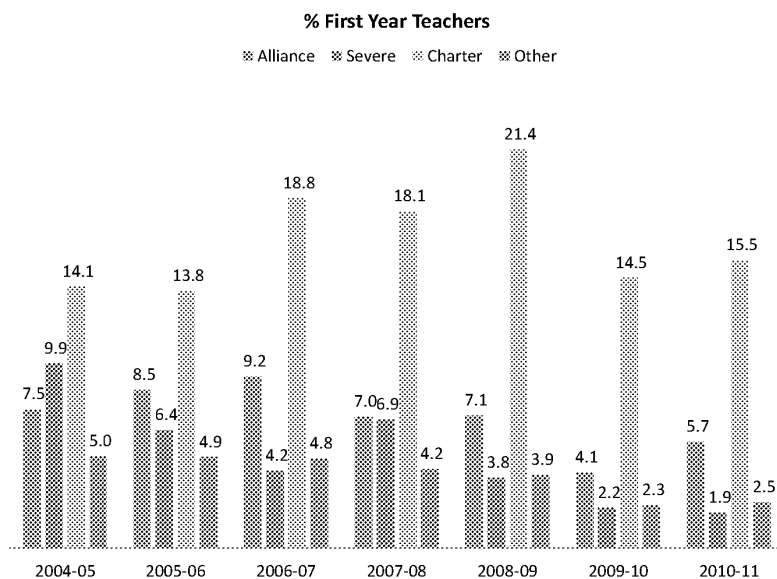
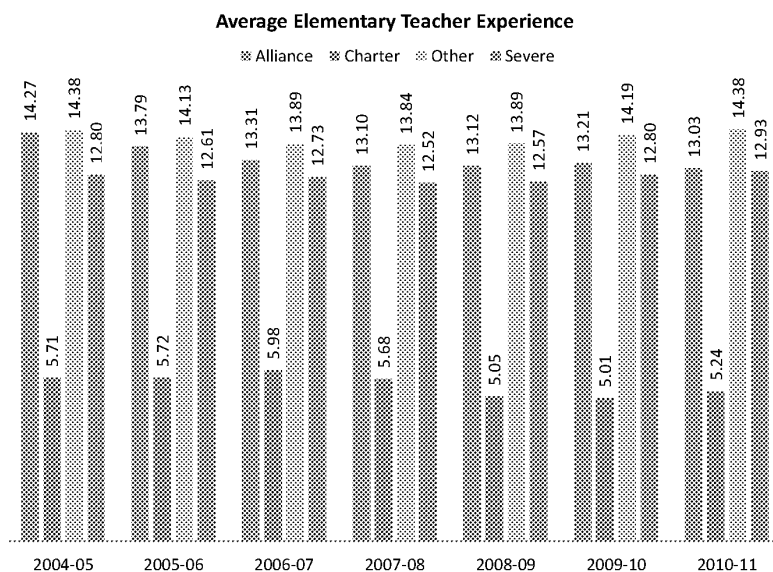


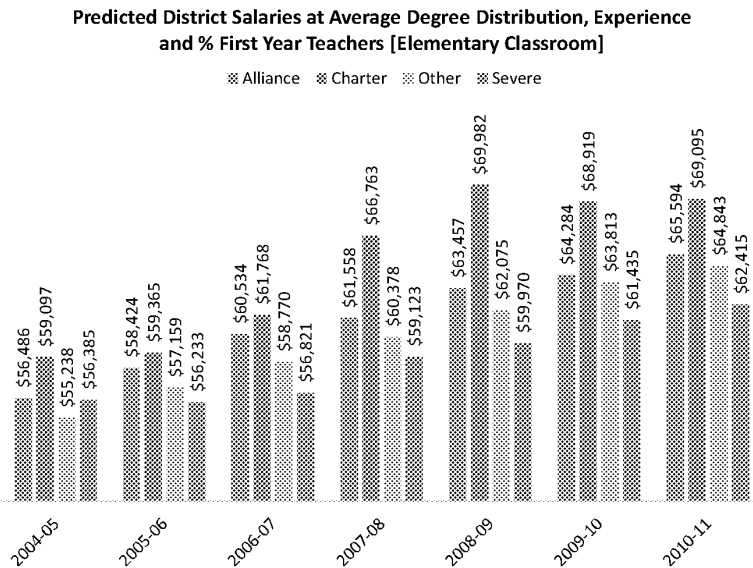
Figure 12 shows the average experience levels over time by group. Severely underfunded districts continue to have less experienced teachers on average. One reason for presenting this information is that the following Figure 13 shows that **if** average experience was the same and shares of teachers by degree level were the same, teachers in these very high need severely underfunded districts would have lower average salaries (over \$2,000 lower than in “other” districts). Because experience is not similar, actual salaries are even lower.

Figure 12



As indicated in our 2011 report, high need districts would not merely need comparable salaries to recruit and retain comparable teachers, they would need higher salaries. Instead they are lower and those disparities have not improved over time, as indicated in Figure 13. Figure 13 is based on a regression model (estimates in Attachment 2) of district average salaries as a function of teacher characteristics, using elementary classroom teachers only.

**Figure 13**



#### **4.0 The Lack of Substantive Changes in Funding Distribution Coincides with Lack of Substantive Changes in Distribution of Measured Student Outcomes**

The next few figures present the most recent performance outcome disparities (2012-13) with respect to concentrations of low income children. Figure 14 and Figure 15 present CAPT Grade 10 assessment data with respect to school level concentrations of low income children, in both cases showing that strong negative associations have been maintained. Notably, these figures include only information on concentrations of low income children but not children with disabilities. While some charter schools appear to be performing at relatively high levels, it may be due in part to their very low concentrations of children with disabilities (see attachment 1). The same may be true of apparent “outlier” schools among traditional district schools. Patterns for math (Figure 14) and reading (Figure 15) are nearly identical. Attachment 3 compares disparities by proficient rates to disparities by shares meeting the “goal” standard. On average, shares meeting the higher “goal” standard are lower and the disparities (slope of the trendline) with respect to poverty is slightly steeper.

Figure 14

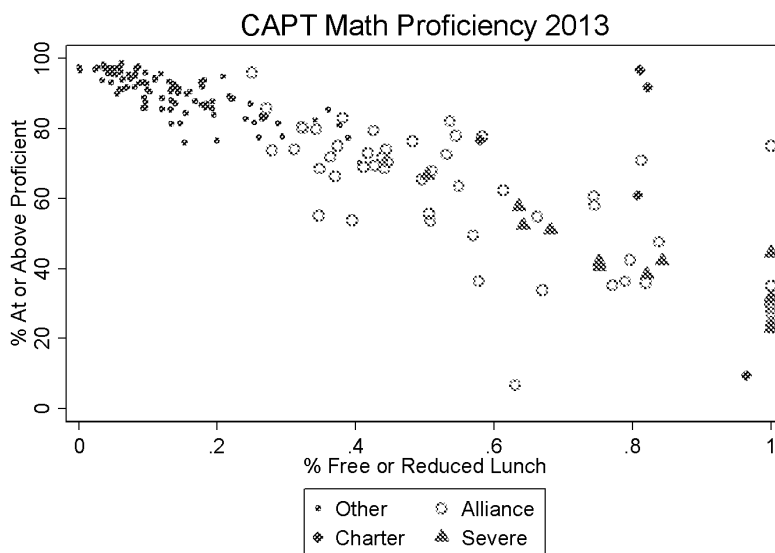


Figure 15

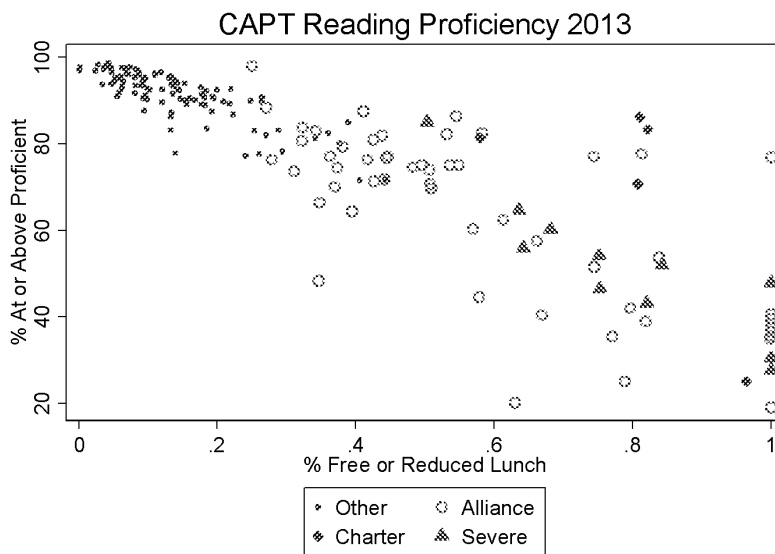


Figure 16

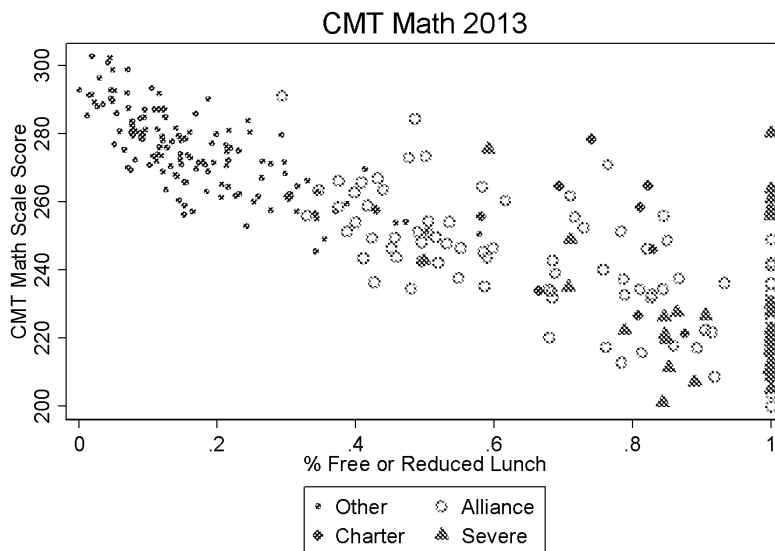


Figure 16 reveals persistent disparities in CMT math in 2012-13 with respect to poverty.

Figure 17

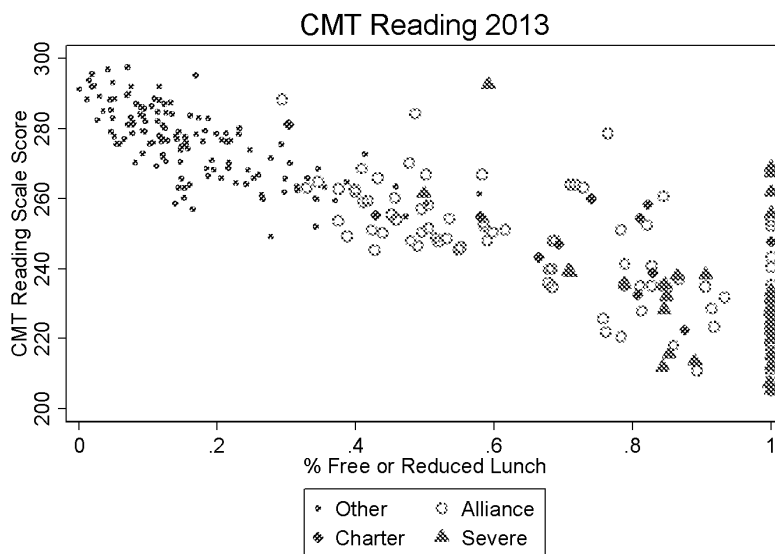


Figure 17 reveals persistent disparities in CMT reading in 2012-13 with respect to poverty.

Table 6 summarizes the correlations between outcome measures and school level concentrations of low income children. Clearly, no progress has been made at moderating these correlations in recent years.

**Table 6**

**Correlations (School Level) between Subsidized Lunch Rates & Outcome Measures**

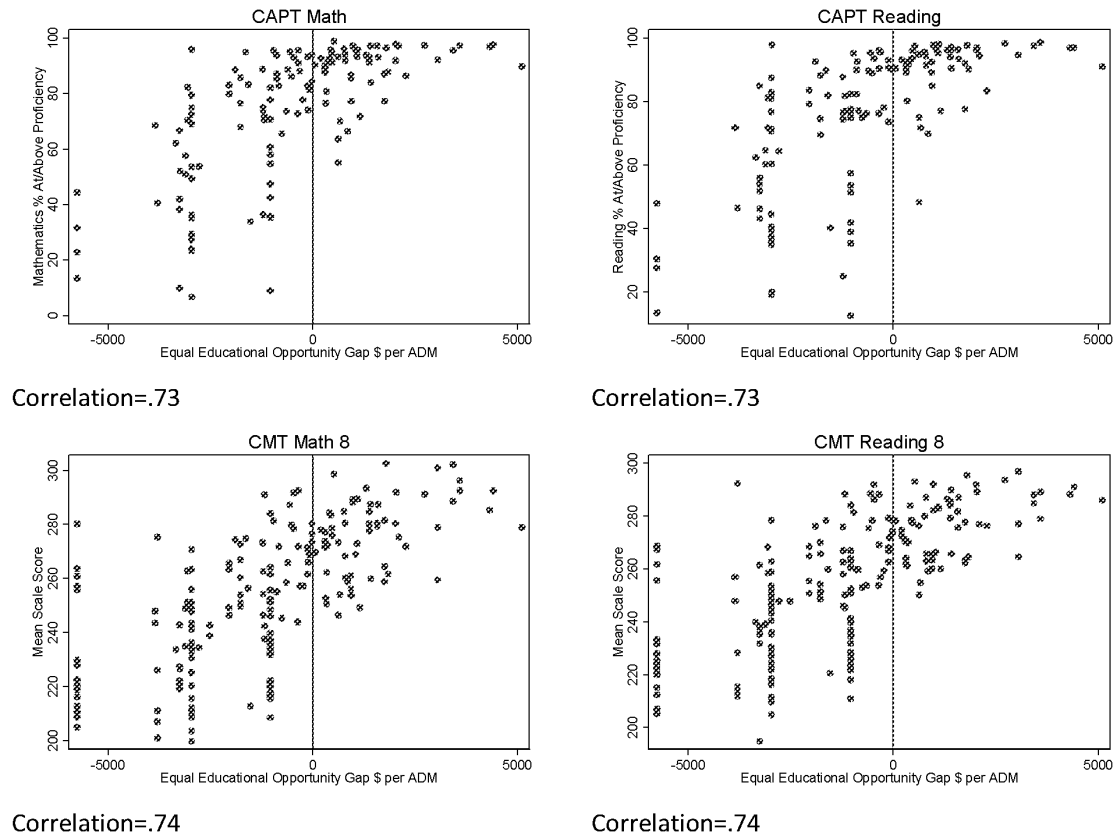
	CMT Reading 8 Scale Score	CMT Math 8 Scale Score	CAPT Math Proficiency	CAPT Reading Proficiency
<b>2005-06</b>	-0.8830	-0.9089		
<b>2006-07</b>	-0.8957	-0.9006	- .9084	- .9054
<b>2007-08</b>	-0.8771	-0.8801	- .8995	- .8992
<b>2008-09</b>	-0.8986	-0.9027	- .9098	- .8845
<b>2009-10</b>	-0.8959	-0.8965	- .9000	- .8573
<b>2010-11</b>	-0.9212	-0.9091	- .8959	- .8734
<b>2011-12</b>	-0.9043	-0.8929	- .8937	- .8720
<b>2012-13</b>	-0.9032	-0.8873	- .9195	- .9162

Note: Weighted for number of test takers

Figure 18 shows that funding gaps (relative to the average district in 2008) remain substantially correlated with outcome gaps. Schools in districts facing funding gaps relative to the average tend to have lower performance than schools in districts with funding that is above the average district, when adjusted for costs and needs (based on our original 2011 report).

Figure 18

Equal Educational Opportunity Funding Gaps (2007-2008) and Outcomes (2012-13)



The pattern in Figure 18 is driven by the fact that higher poverty districts have both larger funding gaps and lower outcomes. Table 7 provides regression output, for descriptive purposes, showing that funding variation is associated with outcome variation even after controlling for variation in concentrations of low income children (at the school level). That is, among schools with comparable low income concentrations, those in districts with higher need adjusted funding have higher outcomes.

Table 7 shows that \$1,000 more in need adjusted spending per pupil is associated with 4.32 points higher scale score in 8<sup>th</sup> grade math (6.67 higher if using only 2010-2013, p<.01), 3.94 points higher in 8<sup>th</sup> grade reading (6.06 higher if using only 2010-2013, p<.01), 3.41 % more students proficient in 10<sup>th</sup> grade math (5.44% higher if using only 2010-2013, p<.01) and 3.06%



more students proficient in 10<sup>th</sup> grade reading (4.90% higher if using only 2010-2013, p<.01), among schools with similar concentrations of low income children.

**Table 7**

**Outcome Variation is Related to Funding Gaps when Controlling for Low Income Concentration**

	Math 8 CMT Scale Score		Reading 8 CMT Scale Score		Math 10 CAPT Proficient		Reading 10 CAPT Proficient	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
% Free or Reduced	-0.50	*	-0.44	*	-0.46	*	-0.38	*
<b>\$\$ ('000s) Relative to EEO</b>	<b>4.32</b>	<b>*</b>	<b>3.94</b>	<b>*</b>	<b>3.41</b>	<b>*</b>	<b>3.06</b>	<b>*</b>
Year=2008	0.25		-1.51		2.56	**	3.16	*
Year=2009	5.59	*	2.33	**	2.48	**	3.29	*
Year=2010	10.67	*	11.63	*	3.59	*	4.96	*
Year=2011	10.93	*	13.92	*	5.60	*	4.63	*
Year=2012	-5.62	*	3.12	*	-8.61	*	-7.27	*
Year=2013	-8.56	*	1.26		-9.03	*	-7.39	*
Constant	272.53	*	264.63	*	89.07	*	90.01	*
Adj. Rsq	0.69		0.72		0.69		0.67	

\*p<.05, \*\*p<.10

**5.0 Nominal changes in policy and governance do not substantively alter the distribution of opportunities for Connecticut school children**

In this section, I address arguments made by the state, intended to be supported by affidavits of Commissioner Stefan Pryor and consultant Richard Seder as part of the state’s motion to dismiss. The State’s brief and attached affidavits of Commissioner Stefan Pryor and consultant Richard Seder suggest that recently adopted nominal governance changes and mandates render plaintiffs’ claims of funding inequity and inadequacy no-longer ripe. Neither the commissioner nor the consultant provides any basis as to how or why these reforms would likely alter the distribution of educational opportunity across Connecticut children. They essentially argue that since we don’t know and can’t guess the effects of these reforms, the court is obligated to assume those effects to be positive, and to wait and see (for the next three or so years) what happens.

It’s highly unlikely that these reforms could have any substantive effect on the distribution of opportunities to Connecticut school children and these reforms do little or nothing to alter the equity or adequacy of resources available.

Commissioner Pryor indicates that the state may provide additional resources to schools within Alliance districts, or those in the Commissioner's network to adopt such measures as expanded early childhood education and longer school years. However, the Commissioner provides no assurance that the neediest Alliance districts (or any for that matter) will actually receive substantial (or any) additional aid to achieve these goals and provides no evidence that the aid allocated would come close to those levels identified in my earlier work with Robert Bifulco (\$3,000 to \$5,000 per pupil in many severely underfunded districts).

Budgeted funds for these interventions fall well short of these levels, and are not guaranteed. Instead, we are to assume that the adopted policy changes, regardless of resource equity or adequacy, will move the system toward greater equity and adequacy.

As noted by Commissioner Pryor in his affidavit, the legislation provides for 25 schools to enter the Commissioner's network and have access to the types of assistance the Commissioner describes. There are far more than 25 schools in total in the districts we previously identified as needing substantial increases in funding. Further, each school can remain in the network for a maximum of three years, and it is unclear whether any supports would exist beyond those three years. Finally, selection and persistence in the pool is at the sole discretion of the Commissioner.

Educational adequacy and equal educational opportunity a) should not be reserved for a tiny minority of schools, b) should not sunset and c) should not be at the discretion of a single political appointee.

Equally if not more likely, the various proposed structural and governance changes, coupled with new unfunded mandates, will exacerbate existing inequities across Connecticut schools and districts. For example, many of the policy changes argued by the state to negate plaintiffs' claims are little more than labeling schemes that merely highlight existing disparities. These labeling schemes include a) creation of the Alliance Districts, b) crafting of new labels/classifications under the state's No Child Left Behind waiver, and c) creation of the Commissioner's network schools, reserved largely for those receiving the worst of labels. Further, these labels come with governance consequences but few if any promises of resources. The most negative and consequential labels fall disproportionately on schools in those districts already disadvantaged financially.

A substantial body of existing literature links school rating systems with local residential property values, including state accountability system assigned school grades.<sup>4</sup> In short, negative labels may lead to further erosion of housing values and tax base. Further, it is likely

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<sup>4</sup> Figlio, D. N., & Lucas, M. E. (2004). Whats in a Grade? School Report Cards and the Housing Market. *The American Economic Review*, 94(3), 591-604.

that increased threat of state intervention and reduction of local control over schools may adversely affect local property values. The proposed reforms, lacking any substantive provision of additional resources, threaten to accelerate a downward spiral of districts already in long-run economic and educational decline.

The updated classification scheme involves existing “turnaround” schools which are schools identified as “low performing” which already are included under the Federal School Improvement Grants program. The classification scheme then identifies schools to be targeted for similar intervention down the line – starting with “review” schools – which are “among Connecticut’s lowest performing, irrespective of Title I status.”<sup>5</sup> Focus schools are those with one or more lower performing subgroups. By contrast, “Schools of Distinction have achieved State targets for achievement and graduation rates for all students or have made notable progress toward these goals. By creating this list, the CDSE recognizes the commendable work these schools have done and results they have achieved.”<sup>6</sup>

Already, a large share of schools classified as “review” schools are not only high need schools, but high need schools concentrated in districts identified in my report with Robert Bifulco as severely underfunded districts (Bridgeport, Meriden, New Britain, New London & Waterbury).<sup>7</sup> By contrast, the main distinction of many of the “distinction” schools identified in urban Connecticut contexts is that they serve very few of the lowest income children, few or no children with disabilities and few or no children with limited English language proficiency.<sup>8</sup> Meanwhile, other schools of distinction are those in the state’s most affluent suburbs. In other words, the state has adopted a rating scheme driven primarily by student demographics to mislabel the “quality” or “effectiveness” of local public schools. Further, the rating scheme is designed to grant the state greater authority to disrupt local governance of schools, which, while the state may perceive this alternative only in positive light, local property owners and potential property owners may view it quite differently.

Finally, an assertion made by Commissioner Pryor was that the introduction of new policies governing teacher evaluation will improve both the overall quality of the teaching workforce and improve specifically the quality of the teaching workforce in high need districts such as Alliance districts. By linking this assertion to the state’s argument that policy changes

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<sup>5</sup> “All schools with CMT/ CAPT 2012 participation rates less than 95 percent, four-year cohort graduation rates below 60 percent (for the graduating class of 2011), three-year baseline School Performance Indexes (SPIs) below 64 or identification as Focus Schools were classified as Review Schools. Like Turnaround Schools, Review Schools must develop plans during this academic year and are not required to implement until either 2013-2014 or 2014-2015.” See: <http://www.sde.ct.gov/sde/cwp/view.asp?a=2683&Q=334526>

<sup>6</sup> See: <http://www.sde.ct.gov/sde/cwp/view.asp?a=2683&Q=334526>

<sup>6</sup> [http://www.sde.ct.gov/sde/lib/sde/pdf/nclb/waiver/review\\_schools.pdf](http://www.sde.ct.gov/sde/lib/sde/pdf/nclb/waiver/review_schools.pdf)

<sup>7</sup> [http://www.sde.ct.gov/sde/lib/sde/pdf/nclb/waiver/review\\_schools.pdf](http://www.sde.ct.gov/sde/lib/sde/pdf/nclb/waiver/review_schools.pdf)

<sup>8</sup> These include schools such as Elm City College Prep, Capitol Prep, Achievement First Bridgeport. For comparisons of demographics see Attachment 1, Table A3.

redistribute (positively) educational opportunities for Connecticut school children, the Commissioner would appear to be asserting that adoption of this policy negates the relevance of funding disparities and/or inadequacies. This assertion is entirely without foundation or supporting evidence.

Even if one chose to accept that improved teacher evaluation systems and teacher effectiveness measures could be leveraged to better select among teachers on the labor market or in a particular district workforce, our ability to apply that leverage to improve the workforce as a whole, or achieve more equitable distribution of teaching quality would be constrained by a) the overall landscape of teacher compensation relative to other career alternatives and b) the persistent inequities in financial resources across districts and resulting inequities teacher compensation across advantaged and disadvantaged schools and districts.

The suggestion that mandated changes to teacher evaluation alone will improve the equity and adequacy of the teacher workforce – regardless of resources - ignores that the proposed evaluation models have the potential to significantly increase job uncertainty for teachers without providing increased wages or benefits to counterbalance the risk. Increased job/career and wage expectation uncertainty, while holding wages on average, constant, is likely to lead to reduced, not increased quality of entrants to the profession.

Further, given the emerging body of evidence on the types of metrics proposed for teacher evaluation, career uncertainty is likely to be inequitably distributed, disadvantaging children in already disadvantaged districts and schools.<sup>9</sup>

Additionally, new data and observation intensive teacher evaluation schemes likely come with substantial up-front costs that are not being addressed with additional state aid. The ability to front those costs varies widely because of the persistent inequities in school funding under ECS.

On page 79 of our original report, Robert Bifulco and I, using data through 2009-10, show that:

- A teacher in a low spending/low outcome district is likely to be paid about \$1,000 less than a comparable teacher in a high spending/high outcome district in the same labor market;
- A teacher in a severe disparity district is likely to be paid about \$1,800 less than a comparable teacher in all other districts in the same labor market;

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<sup>9</sup> Baker, B.D., Oluwole, J., Green, P.C. III (2013) The legal consequences of mandating high stakes decisions based on low quality information: Teacher evaluation in the race-to-the-top era. Education Policy Analysis Archives, 21(5). This article is part of EPAA/AAPE's Special Issue on Value-Added: What America's Policymakers Need to Know and Understand, Guest Edited by Dr. Audrey Amrein-Beardsley and Assistant Editors Dr. Clarin Collins, Dr. Sarah Polasky, and Ed Sloat. Retrieved [3-25-31], from <http://epaa.asu.edu/ojs/article/view/1298>

- A teacher in a severe disparity district is likely to be paid about \$1,600 less than a comparable teacher in other low spending/low outcome districts in the same labor market.

On Page 84 we show that:

- Teachers working in the severe disparity group are 20% more likely to be “novice” teachers than teachers in all other districts.
- Teachers in low spending/low outcomes districts are 19% more likely to be novice teachers than those in high spending/high outcomes districts.

Recently adopted reforms do nothing to alter these findings and thus do nothing to substantively change, or improve, the equity or adequacy of resources available to Connecticut school children.

## **6.0 School Finance Reforms as Necessary Underlying Condition for Improving Student Outcomes**

There exists an increasing body of evidence that substantive and sustained state school finance reforms matter for improving both the level and distribution of short term and long run student outcomes. A few studies have attempted to tackle school finance reforms broadly applying multi-state analyses over time. Card and Payne (2002) found “evidence that equalization of spending levels leads to a narrowing of test score outcomes across family background groups.”<sup>10</sup> (p. 49) Jackson, Johnson and Persico (2014) use data from the Panel Study of Income Dynamics (PSID) to evaluate long term outcomes of children exposed to court-ordered school finance reforms, based on matching PSID records to childhood school districts for individuals born between 1955 and 1985 and followed up through 2011. They find that the “Effects of a 20% increase in school spending are large enough to reduce disparities in outcomes between children born to poor and non-poor families by at least two-thirds,” and further that “A 1% increase in per-pupil spending increases adult wages by 1% for children from poor families.”(p. 42)<sup>11</sup>

Figlio (2004) explains that the influence of state school finance reforms on student outcomes is perhaps better measured within states over time, explaining that national studies

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<sup>10</sup> Card, D., and Payne, A. A. (2002). School Finance Reform, the Distribution of School Spending, and the Distribution of Student Test Scores. *Journal of Public Economics*, 83(1), 49-82.

<sup>11</sup> Jackson, C. K., Johnson, R. C., & Persico, C. (2014). The Effect of School Finance Reforms on the Distribution of Spending, Academic Achievement, and Adult Outcomes.

of the type attempted by Card and Payne confront problems of a) the enormous diversity in the nature of state aid reform plans, and b) the paucity of national level student performance data. Most recent peer reviewed studies of state school finance reforms have applied longitudinal analyses within specific states.<sup>12</sup> And several such studies provide compelling evidence of the potential positive effects of school finance reforms. Roy (2011) published an analysis of the effects of Michigan's 1990s school finance reforms which led to a significant leveling up for previously low-spending districts.<sup>13</sup> Roy, whose analyses measure both *whether* the policy resulted in changes in funding and *who* was affected, found that "Proposal A was quite successful in reducing interdistrict spending disparities. There was also a significant positive effect on student performance in the lowest-spending districts as measured in state tests." (p. 137) Similarly, Papke (2001), also evaluating Michigan school finance reforms from the 1990s, found that "increases in spending have nontrivial, statistically significant effects on math test pass rates, and the effects are largest for schools with initially poor performance." (Papke, 2005, p. 821)<sup>14</sup> Deke (2003) evaluated "leveling up" of funding for very-low-spending districts in Kansas, following a 1992 lower court threat to overturn the funding formula (without formal ruling to that effect).<sup>15</sup> The Deke article found that a 20 percent increase in spending was associated with a 5 percent increase in the likelihood of students going on to postsecondary education. (p. 275)

Two studies of Massachusetts school finance reforms from the 1990s find similar results. The first, a non-peer-reviewed report by Downes, Zabel, and Ansel (2009) explored, in combination, the influence on student outcomes of accountability reforms and changes to school spending. It found that "Specifically, some of the research findings show how education reform has been successful in raising the achievement of students in the previously low-spending districts." (p. 5)<sup>16</sup> The second study, an NBER working paper by Guryan (2001), focused more specifically on the redistribution of spending resulting from changes to the state school finance formula.<sup>17</sup> It found that "increases in per-pupil spending led to significant increases in math, reading, science, and social studies test scores for 4th- and 8th-grade students. The magnitudes imply a \$1,000 increase in per-pupil spending leads to about a third

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<sup>12</sup> Figlio, D.N. (2004) Funding and Accountability: Some Conceptual and Technical Issues in State Aid Reform. In Yinger, J. (ed) p. 87-111 *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*. MIT Press.

<sup>13</sup> Roy, J. (2011). Impact of school finance reform on resource equalization and academic performance: Evidence from Michigan. *Education Finance and Policy*, 6(2), 137-167.

<sup>14</sup> Papke, L. (2005). The effects of spending on test pass rates: evidence from Michigan. *Journal of Public Economics*, 89(5-6). 821-839. In a separate study, Leuven and colleagues (2007) attempted to isolate specific effects of increases to at-risk funding on at risk pupil outcomes, but did not find any positive effects.

<sup>15</sup> Deke, J. (2003). A study of the impact of public school spending on postsecondary educational attainment using statewide school district refinancing in Kansas, *Economics of Education Review*, 22(3), 275-284.

<sup>16</sup> Downes, T. A., Zabel, J., and Ansel, D. (2009). *Incomplete Grade: Massachusetts Education Reform at 15*. Boston, MA. MassINC.

<sup>17</sup> Guryan, J. (2001). Does Money Matter? Estimates from Education Finance Reform in Massachusetts. Working Paper No. 8269. Cambridge, MA: National Bureau of Economic Research.

to a half of a standard-deviation increase in average test scores. It is noted that the state aid driving the estimates is targeted to under-funded school districts, which may have atypical returns to additional expenditures.” (p. 1)<sup>18</sup> Downes had conducted earlier studies of Vermont school finance reforms in the late 1990s (Act 60).<sup>19</sup> In a 2004 book chapter, Downes noted “All of the evidence cited in this paper supports the conclusion that Act 60 has dramatically reduced dispersion in education spending and has done this by weakening the link between spending and property wealth. Further, the regressions presented in this paper offer some evidence that student performance has become more equal in the post-Act 60 period. And no results support the conclusion that Act 60 has contributed to increased dispersion in performance.” (p. 312)<sup>20</sup>

Most recently, Hyman (2013) also found positive effects of Michigan school finance reforms in the 1990s, but raised some concerns regarding the distribution of those effects.<sup>21</sup> Hyman found that much of the increase was targeted to schools serving fewer low income children. But, the study did find that students exposed to an additional “12%, more spending per year during grades four through seven experienced a 3.9 percentage point increase in the probability of enrolling in college, and a 2.5 percentage point increase in the probability of earning a degree.” (p. 1)

Indeed, this point is not without some controversy, much of which is easily discarded. Second-hand references to dreadful failures following massive infusions of new funding can

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<sup>18</sup> While this paper remains an unpublished working paper, the advantage of Guryan’s analysis is that he models the expected changes in funding at the local level as a function of changes to the school finance formula itself, through what is called an instrumental variables or two stage least squares approach. Then, Guryan evaluates the extent to which these policy induced variations in local funding are associated with changes in student outcomes. Across several model specifications, Guryan finds increased outcomes for students at Grade 4 but not grade 8. A counter study by the Beacon Hill Institute suggest that reduced class size and/or increased instructional spending either has no effect on or actually worsens student outcomes (Jaggia & Vachharajani, 2004).

<sup>19</sup> Downes, T. A. (2004). School Finance Reform and School Quality: Lessons from Vermont. In Yinger, J. (ed), *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*. Cambridge, MA: MIT Press

<sup>20</sup> Two additional studies of school finance reforms in New Jersey also merit some attention in part because they directly refute findings of Hanushek and Lindseth and of the earlier Cato study and do so with more rigorous and detailed methods. The first, by Alex Resch (2008) of the University of Michigan (doctoral dissertation in economics), explored in detail the resource allocation changes during the scaling up period of school finance reform in New Jersey. Resch found evidence suggesting that New Jersey *Abbott* districts “directed the added resources largely to instructional personnel” (p. 1) such as additional teachers and support staff. She also concluded that this increase in funding and spending improved the achievement of students in the affected school districts. Looking at the statewide 11th grade assessment (“the only test that spans the policy change”), she found: “that the policy improves test scores for minority students in the affected districts by one-fifth to one-quarter of a standard deviation” (p. 1). Goertz and Weiss (2009) also evaluated the effects of New Jersey school finance reforms, but did not attempt a specific empirical test of the relationship between funding level and distributional changes and outcome changes. Thus, their findings are primarily descriptive. Goertz and Weiss explain that on state assessments achievement gaps closed substantially between 1999 and 2007, the period over which Abbott funding was most significantly scaled up. Goertz & Weiss further explain: “State Assessments: In 1999 the gap between the Abbott districts and all other districts in the state was over 30 points. By 2007 the gap was down to 19 points, a reduction of 11 points or 0.39 standard deviation units. The gap between the Abbott districts and the high-wealth districts fell from 35 to 22 points. Meanwhile performance in the low-, middle-, and high-wealth districts essentially remained parallel during this eight-year period” (Figure 3, p. 23).

<sup>21</sup> Hyman, J. (2013). Does Money Matter in the Long Run? Effects of School Spending on Educational Attainment.



often be traced to methodologically inept, anecdotal tales of desegregation litigation in Kansas City, Missouri, or court-ordered financing of urban districts in New Jersey (see Baker & Welner, 2011).<sup>22</sup> Hanushek and Lindseth (2009)<sup>23</sup> use a similar anecdote-driven approach in which they dedicate a chapter of a book to proving that court-ordered school funding reforms in New Jersey, Wyoming, Kentucky, and Massachusetts resulted in few or no measurable improvements. However, these conclusions are based on little more than a series of graphs of student achievement on the National Assessment of Educational Progress in 1992 and 2007 and an untested assertion that, during that period, each of the four states infused substantial additional funds into public education in response to judicial orders.<sup>24</sup> Greene and Trivitt (2008) present a study in which they claim to show that court ordered school finance reforms let to no substantive improvements in student outcomes.<sup>25</sup> However, the authors test only whether the presence of a court order is associated with changes in outcomes, and never once measure whether substantive school finance reforms followed the court order, but still express the conclusion that court order funding increases had no effect. In equally problematic analysis, Neymotin (2010) set out to show that massive court ordered infusions of funding in Kansas following *Montoy v. Kansas* led to no substantive improvements in student outcomes. However, Neymotin evaluated changes in school funding from 1997 to 2006, but the first

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<sup>22</sup>Baker, B. D., & Welner, K. G. (2011). School finance and courts: Does reform matter, and how can we tell. *Teachers College Record*, 113(11), 2374-2414. Two reports from Cato Institute are illustrative (Ciotti, 1998, Coate & VanDerHoff, 1999). Ciotti, P. (1998). Money and School Performance: Lessons from the Kansas City Desegregations Experience. *Cato Policy Analysis* #298.

Coate, D. & VanDerHoff, J. (1999). Public School Spending and Student Achievement: The Case of New Jersey. *Cato Journal*, 19(1), 85-99.

<sup>23</sup> Hanushek, E. A., and Lindseth, A. (2009). *Schoolhouses, Courthouses and Statehouses*. Princeton, N.J.: Princeton University Press., See also: [http://edpro.stanford.edu/Hanushek/admin/pages/files/uploads/06\\_EduO\\_Hanushek\\_g.pdf](http://edpro.stanford.edu/Hanushek/admin/pages/files/uploads/06_EduO_Hanushek_g.pdf)

<sup>24</sup> That is, the authors merely assert that these states experienced large infusions of funding, focused on low income and minority students, within the time period identified. They necessarily assume that, in all other states which serve as a comparison basis, similar changes did not occur. Yet they validate neither assertion. Baker and Welner (2011) explain that Hanushek and Lindseth failed to even measure whether substantive changes had occurred to the level or distribution of school funding as well as when and for how long. In New Jersey, for example, infusion of funding occurred from 1998 to 2003 (or 2005), thus Hanushek and Lindseth's window includes 6 years on the front end where little change occurred (When?). Kentucky reforms had largely faded by the mid to late 1990s, yet Hanushek and Lindseth measure post reform effects in 2007 (When?). Further, in New Jersey, funding was infused into approximately 30 specific districts, but Hanushek and Lindseth explore overall changes to outcomes among low-income children and minorities using NAEP data, where some of these children attend the districts receiving additional support but many did not (Who?). In short the slipshod comparisons made by Hanushek and Lindseth provide no reasonable basis for asserting either the success or failures of state school finance reforms. Hanushek (2006) goes so far as to title the book "How School Finance Lawsuits Exploit Judges' Good Intentions and Harm Our Children." The premise that additional funding for schools often leveraged toward class size reduction, additional course offerings or increased teacher salaries, causes harm to children is, on its face, absurd. And the book which implies as much in its title never once validates that such reforms ever do cause harm. Rather, the title is little more than a manipulative attempt to convince the non-critical spectator who never gets past the book's cover to fear that school finance reforms might somehow harm children. The book also includes two examples of a type of analysis that occurred with some frequency in the mid-2000s which also had the intent of showing that school funding doesn't matter. These studies would cherry pick anecdotal information on either or both a) poorly funded schools that have high outcomes or b) well-funded schools that have low outcomes (see Evers & Clopton, 2006, Walber, 2006).

<sup>25</sup> Greene, J. P. & Trivitt, (2008). Can Judges Improve Academic Achievement? *Peabody Journal of Education*, 83(2), 224-237.

additional funding infused following the January 2005 supreme court decision occurred in the 2005-06 school year, the end point of Neymotin's outcome data.<sup>26</sup>

On balance, it is safe to say that a sizeable and growing body of rigorous empirical literature validates that state school finance reforms can have substantive, positive effects on student outcomes, including reductions in outcome disparities or increases in overall outcome levels.

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<sup>26</sup> Neymotin, F. (2010) The Relationship between School Funding and Student Achievement in Kansas Public Schools. *Journal of Education Finance* 36 (1) 88-108

**Attachment 1**

**Table A1. Selected Characteristics of Charter Schools in Cities where Mean % Free Lunch Exceeds 50%**

<i>School</i>	<b>% Free Lunch [1]</b>		<b>% ELL [2]</b>		<b>% Disability [3]</b>	
	<i>City</i>	<i>School</i>	<i>City</i>	<i>School</i>	<i>City</i>	<i>School</i>
Achievement First Bridgeport	91%	58%	12%	8%	10%	7%
Achievement First Hartford	84%	75%	16%	5%	11%	8%
Amistad Academy	69%	61%	12%	11%	10%	5%
Charter School for Youth	84%	31%	16%	1%	11%	4%
Common Ground High School	69%	48%	12%	4%	10%	12%
Elm City College Prep	69%	N/A[4]	12%	4%	10%	5%
Interdistrict School	76%	53%	20%	6%	13%	16%
Jumoke Academy	84%	52%	16%	0%	11%	4%
Park City Prep Charter	91%	47%	12%	0%	10%	8%
The Bridge Academy	91%	61%	12%	1%	10%	12%

[1] Common Core of Data (CCD) "Public Elementary/Secondary School Universe Survey" 2010-11 v.2a.  
 [2] CT SDE Portal: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/EIIDTViewer.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/EIIDTViewer.aspx) combined with CCD.  
 [3] CT SDE Portal, Special Education - Students with Disabilities Grades K-12 by Disability Category and Public School Facility, [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/SpecialEducationDTViewer.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/SpecialEducationDTViewer.aspx) combined with CCD.  
 [4] Data for Elm City College Prep reported as "Not Applicable" in NCES Common Core

**Table A2. Total & Comparable per Pupil Spending for Charters & Districts with Free/Reduced Lunch >50%, 2009-10, Prior to Funding Boost for Charter Schools**

Name	Total Spending per Pupil [1]	Total Spending Rank	Comparable Spending per Pupil (Excl. Trans [1] & Special Ed.[2])	Comparable Spending Rank
Trailblazers Academy District	\$24,670	1	\$24,670	1
Stamford Academy	\$20,368	2	\$20,368	2
Amistad Academy District	\$13,397	11	\$13,397	3
Bridgeport Achievement First	\$12,619	13	\$12,619	4
<b>New Haven School District</b>	<b>\$16,498</b>	<b>4</b>	<b>\$12,561</b>	<b>5</b>
Common Ground High School District	\$12,445	15	\$12,445	6
Elm City College Preparatory School	\$11,996	17	\$11,996	7
<b>Hartford School District</b>	<b>\$16,876</b>	<b>3</b>	<b>\$11,939</b>	<b>8</b>
Interdistrict School for Arts and...	\$11,697	19	\$11,697	9
New Beginnings Inc., Family Academy	\$11,348	20	\$11,348	10
Putnam School District	\$15,212	5	\$11,273	11
Achievement First Hartford Academy	\$11,222	21	\$11,222	12
Park City Prep Charter School	\$10,725	22	\$10,725	13
Highville Charter School District	\$10,600	23	\$10,600	14
The Bridge Academy District	\$10,277	25	\$10,277	15
Waterbury School District	\$14,122	7	\$10,163	16
Norwich School District	\$14,677	6	\$10,056	17
<b>Bridgeport School District</b>	<b>\$13,479</b>	<b>10</b>	<b>\$10,043</b>	<b>18</b>
Jumoke Academy District	\$9,850	26	\$9,850	19
Windham School District	\$14,116	8	\$9,535	20
New London School District	\$13,824	9	\$9,470	21
East Hartford School District	\$11,987	18	\$9,152	22
Meriden School District	\$12,616	14	\$8,827	23
Derby School District	\$12,236	16	\$8,793	24
New Britain School District	\$12,936	12	\$8,068	25
Ansonia School District	\$10,455	24	\$7,752	26

[1] Per Pupil Expenditures by Type: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/FinanceDTVviewer.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/FinanceDTVviewer.aspx)

[2] Spending on Special Education:

[http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/SpecialEducationResourcesDTVviewer.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/SpecialEducationResourcesDTVviewer.aspx)

[3] Percent Free or Reduced Lunch: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StudentNeedDTVviewer.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StudentNeedDTVviewer.aspx)

**Table A3. Selected Characteristics of “Distinction Schools” in Cities where Mean % Free Lunch Exceeds 50%**

Distinction Category	% Free Lunch GAP[1]	% ELL GAP[2]	% Disability Gap[3]
<b>High Performing Subgroup</b>			
Elm City College Prep	N/A[4]	-7.9%	-4.8%
House of Arts, Letters	-28.9%	-15.7%	-12.1%
W. F. Kaynor Technical	-40.4%	-9.9%	-12.6%
<b>Average</b>	<b>-38.4%</b>	<b>-9.7%</b>	<b>-9.5%</b>
<b>Growth Among Low Performers</b>			
Achievement First Bridgeport	-33.0%	-4.0%	-3.0%
Capital Preparatory Magnet School	-39.6%	-12.4%	-5.6%
Casimir Pulaski School	16.0%	0.8%	0.4%
Classical Studies Academy	6.7%	-9.4%	-3.4%
Kinsella Magnet School	15.6%	-7.5%	-4.0%
Nathan Hale School	1.4%	-10.0%	0.0%
Wendell L. Cross School	-7.1%	-4.7%	-3.7%
<b>Average</b>	<b>-1.6%</b>	<b>-5.8%</b>	<b>-2.6%</b>
<p>[1] Common Core of Data (CCD) "Public Elementary/Secondary School Universe Survey" 2010-11 v.2a. Difference between average % Free Lunch by Location/City and Individual school % Free Lunch</p> <p>[2] CT SDE Portal: <a href="http://sdeportal.ct.gov/Cedar/WEB/ct_report/ELLDTViewer.aspx">http://sdeportal.ct.gov/Cedar/WEB/ct_report/ELLDTViewer.aspx</a> combined with CCD. Difference between average % ELL by Location/City and Individual School % ELL</p> <p>[3] CT SDE Portal, Special Education - Students with Disabilities Grades K-12 by Disability Category and Public School Facility, <a href="http://sdeportal.ct.gov/Cedar/WEB/ct_report/SpecialEducationDTViewer.aspx">http://sdeportal.ct.gov/Cedar/WEB/ct_report/SpecialEducationDTViewer.aspx</a> combined with CCD. Difference between average % Disability by Location/City and Individual School % Disability</p> <p>[4] Data for Elm City College Prep reported as “Not Applicable” in NCES Common Core</p>			

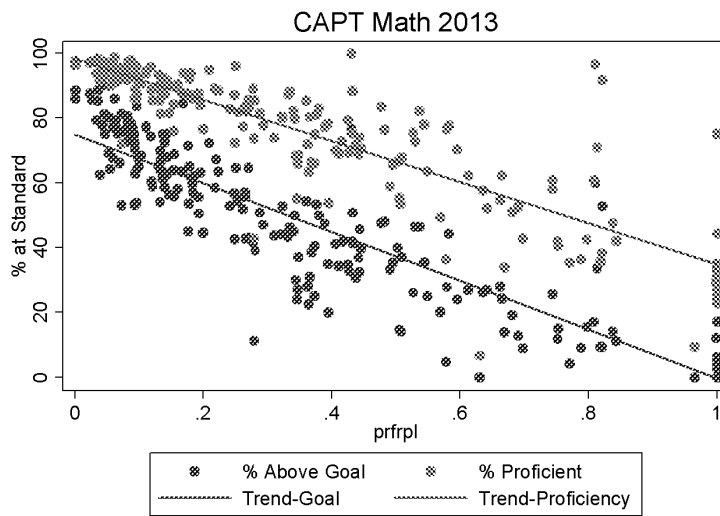
**Attachment 2**

<b>Elementary</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>P&gt;t</b>
<b>Degree Distribution</b>			
% Ph.D.	2,147	151	*
% 6th Year Degree	266	18	*
% MA	200	19	*
<b>Experience Distribution</b>			
% First Year Teachers	-302	58	*
Average Experience	745	90	*
<b>School Group (Alliance = Baseline)</b>			
Charter	2,611	6,129	
Other	-1,248	793	
Severe	-101	1,279	
Special	3,770	3,398	
<b>Year</b>			
Year = 2006	1,938	906	*
Year = 2007	4,048	908	*
Year = 2008	5,072	914	*
Year = 2009	6,971	915	*
Year = 2010	7,797	939	*
Year = 2011	9,108	933	*
<b>Group x Year Interactions</b>			
Charter x 2006	-1,670	8,590	
Charter x 2007	-1,377	8,289	
Charter x 2008	2,594	8,157	
Charter x 2009	3,914	7,479	
Charter x 2010	2,025	7,190	
Charter x 2011	890	7,087	
Other x 2006	-16	1,108	
Other x 2007	-516	1,107	
Other x 2008	68	1,109	
Other x 2009	-133	1,109	
Other x 2010	778	1,118	
Other x 2011	498	1,123	
Severe x 2006	-2,090	1,779	
Severe x 2007	-3,613	1,795	
Severe x 2008	-2,333	1,775	
Severe x 2009	-3,386	1,788	**
Severe x 2010	-2,748	1,789	
Severe x 2011	-3,078	1,810	**
Special x 2006	-1,755	4,651	
Special x 2007	-4,140	4,654	
Special x 2008	-1,873	4,646	
Special x 2009	-3,296	4,441	
Special x 2010	-3,102	4,404	
Special x 2011	-5,569	4,336	
<b>Constant</b>	30,602	2,081	*

\*p<.05, \*\*p<.10

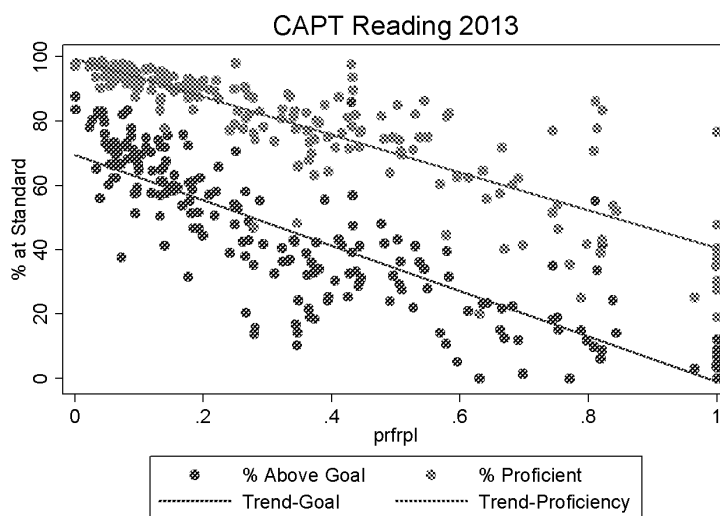
**Attachment 3**

**Figure A3**



Note: prfrpl = % free or reduced price lunch

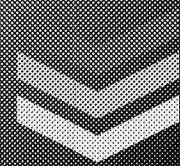
**Figure A4**



Note: prfrpl = % free or reduced price lunch



# Evaluating Connecticut's Education Cost Sharing Program, School Funding & Educational Resources



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10/21/2011

PLAINTIFFS'  
TRIAL EXHIBIT  
No. X07 HHD-CV14-5037565-s

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## Executive Summary

This report is organized in three major sections. In the first section, we assess Connecticut's Educational Cost Sharing (ECS) program relative to conceptions of equity that are well established in the academic literature on school finance. In the second section, we examine the distribution of school funding across districts and evaluate the extent to which equal and adequate educational opportunities are provided across school districts and children. In the third section, we explore disparities in specific programs and services available to children attending districts with low resource levels and low outcomes compared with districts which have high resource levels and high outcomes. We explore teacher characteristics, class sizes, contact hours and the distribution of specific teacher assignments.

In the first section, we identify several features of the ECS program and the way it has been implemented that are not justified by appeal to established conceptions of equity. We also argue that changes in the ECS program since its inception over 20 years ago have tended not to address those features of the ECS program that undermine equity. Our key findings in the first section are the following.

1. The foundation level of funding underlying the ECS formula has never been established by a process reasonably linked to a standard of educational adequacy.
  - a. No analyses have ever been conducted by state agencies to determine whether the appropriated foundation level of funding is suitable for producing desired levels of student outcomes across children and educational settings.
  - b. The foundation level of funding has been held to arbitrarily low levels over time, rarely if ever approaching even the minimum net current expenditures of districts in the current year.
2. Adjustments to the foundation level of funding intended to accommodate differences in student needs and educational settings have never been determined by a process reasonably linked to the costs of providing educational opportunity.
  - a. No documented analyses have been conducted by state agencies to determine the additional costs associated with students in recognized need categories, and the weights used by the state are well below estimates of the additional costs associated with such students drawn from peer reviewed research. As a result, the ECS formula provides negligible financial support for districts facing high concentrations of children in poverty and children with limited English language proficiency.
  - b. The state has infrequently updated student need counts undermining the ability of the ECS formula to provide equitable financial support for districts with growing populations of students in need categories.

- c. The state has failed to take account of other factors that may influence the costs of providing equality of resources or opportunities across districts, including failure to address significant differences in labor costs.
3. Changes to ECS over time, including continual deviations from aid amounts determined by the base ECS formula, have tended to exacerbate rather than address equity concerns.
  - a. ECS caps prohibit higher need districts from receiving even those amounts of aid estimated by the ECS base formula to be needed by those districts
  - b. Minimum aid provisions drive significant amounts of state funding to districts with fewer needy children, limiting available resources for districts serving higher need populations.

In the second section, we find that high poverty districts are underfunded relative to both equal opportunity and adequate opportunity standards. Specifically, we find:

1. The ECS base formula as modified in 2008-09 provides insufficient support to districts serving high need student populations. While the ECS base formula provides roughly 10% higher aid awards for the highest need districts than for the lowest need districts, estimates of the costs of providing educational opportunities suggest that the highest need districts require 50% to 100% more funding than the lowest need districts to provide equal educational opportunities.
2. Equal educational opportunity (EEO) deficits, that is the difference between cost-adjusted spending in the district and the average level of cost-adjusted spending, are greater than \$2,000 per pupil in several districts serving high need student populations. A handful of high need districts have particularly severe EEO funding gaps greater than \$3,000 per pupil.
3. Districts with large EEO deficits also have student outcome measures substantially below those of the average district. EEO gaps are strongly associated with variations in student outcomes.
4. Districts with the largest EEO gaps also have the largest adequacy gaps.
  - a. The statistical relationship between EEO gaps and adequacy gaps, i.e. the difference between district spending and the spending required to provide adequate educational opportunity as estimated by Augenblick and Associates, is very strong.
  - b. Districts with larger adequacy funding gaps also have lower measured outcomes and that relationship is also strong.

In the third section, we generally find that high need districts facing what we define as severe resource disparities also lack in key educational programs and services when compared with more advantaged school districts. Specifically, we find:

1. School districts with very large EEO funding deficits (over \$3,000 per pupil below the state average), low outcomes (>1.5 Standard Deviations below mean) and with elevated LEP/ELL populations have systematically larger class sizes than more advantaged districts at all grade levels.
2. School districts with low cost-adjusted resource levels and low current student outcomes have lower teacher salaries than those in more advantaged districts, and gaps in teacher salaries have grown in recent years.
3. School districts with low cost-adjusted resource levels and low current student outcomes have higher concentrations of novice teachers than more advantaged districts.
4. Students attending low cost-adjusted resource districts with low outcomes have less access to either advanced or enriched curricular opportunities, including:
  - a. Substantially lower 8<sup>th</sup> grade participation rates in high school level math or world languages
  - b. Far fewer contact hours in 5<sup>th</sup> grade in art, physical education and music
  - c. Far fewer assigned teaching and support staff per pupil in areas including Chemistry, French, Latin, Physics, World History, Orchestra, Band, Gifted and Talented Programs, and school librarians/media specialists.

## **1.0 The Education Cost Sharing formula is not built on a rational process for providing either substantially equal or adequate educational resources or opportunities**

The purpose of this section of the report is to assess Connecticut's Educational Cost Sharing (ECS) program relative to conceptions of equity that are well established in the academic literature on school finance. We identify several features of the ECS program and the way it has been implemented that are not justified by appeal to the established conceptions of equity. We also argue that changes in the ECS program since its inception over 20 years ago have tended not to address those features of the ECS program that undermine equity.

Our key findings are the following.

1. The foundation level of funding underlying the ECS formula has never been established by a process reasonably linked to a standard of educational adequacy.
  - a. No analyses have ever been conducted by state agencies to determine whether the appropriated foundation level of funding is suitable for producing desired levels of student outcomes across children and educational settings.
  - b. The foundation level of funding has been held to arbitrarily low levels over time, rarely if ever approaching even the minimum net current expenditures of districts in the current year.
2. Adjustments to the foundation level of funding intended to accommodate differences in student needs and educational settings have never been determined by a process reasonably linked to the costs of providing educational opportunity.
  - a. No documented analyses have been conducted by state agencies to determine the additional costs associated with students in recognized need categories, and the weights used by the state are well below estimates of the additional costs associated with such students drawn from peer reviewed research. As a result, the ECS formula provides negligible financial support for districts facing high concentrations of children in poverty and children with limited English language proficiency.
  - b. The state has infrequently updated student need counts undermining the ability of the ECS formula to provide equitable financial support for districts with growing populations of students in need categories.
  - c. The state has failed to take account of other factors that may influence the costs of providing equality of resources or opportunities across districts, including failure to address significant differences in labor costs.
3. Changes to ECS over time, including continual deviations from aid amounts determined by the base ECS formula, have tended to exacerbate rather than address equity concerns.



- a. Hold harmless provisions prohibit higher need districts from receiving even those amounts of aid estimated by the ECS base formula to be needed by those districts
- b. Minimum aid provisions drive significant amounts of state funding to districts with fewer needy children, limiting available resources for districts serving higher need populations.

The section begins by reviewing a standard set of concepts that are widely used in the school finance literature and which provide a framework for evaluating the ECS program. First, we present several conceptions of equity and specify which of these conceptions are most relevant for the state of Connecticut. Next, we describe two prototypical school aid formulas—the foundation and the guaranteed tax base formulas. We explain the links between these two formulas and the various conceptions of equity, and argue that the foundation aid formula is the most appropriate for the state of Connecticut.

Following this conceptual background, we turn to the ECS program. First, we explain how the ECS formula currently works and compare it to a prototypical foundation formula. Next we identify several “irrationalities” in the ECS formula, which we define as features of the formula which are not justified by appeal to established standards of equity. Next, we identify features of the way the ECS program has been implemented that have created additional irrationalities in the program including minimum local share, stop-loss, hold-harmless, and aid cap provisions. In these sections, we attempt to illustrate how these problematic elements of the ECS program affect the distribution of ECS aid. Finally, we review some of the major changes in the ECS program that have been implemented since it was first established over 20 years ago, and argue that rather than addressing the “irrationalities” in the program, most program changes have tended to exacerbate them.

## 1.1 Conceptions of Equity

Assessment of any education finance system needs to begin with a clear conception of educational equity. Most scholars agree that formulating a clear conception of equity requires specifying two things: the *object of equity* and the *standard of equity*.<sup>1</sup> The object of equity

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<sup>1</sup> See Bruce D. Baker and Preston C. Green, “Conceptions of Equity and Adequacy in School Finance,” in *Handbook of Research in Education Finance and Policy*, eds. Helen F. Ladd and Edward B. Fiske (New York: Routledge, 2008), 203-221; Robert Berne and Leanna Stiefel, *The Measurement of Equity in School Finance: Conceptual, Methodological and Empirical Dimensions* (Baltimore: Johns Hopkins University Press, 1984); Robert Berne and Leanna Stiefel, “Concepts of School Finance Equity: 1970 to the Present,” in *Equity and Adequacy in Education Finance*, eds. Helen F. Ladd, Rosemary Chalk, and Janet S. Hansen (Washington, DC: National Academy Press, 1999), 7-33; David H. Monk, *Education Finance: An Economic Approach* (New York: McGraw-Hill, 1990); and John Yinger, “State Aid and the Pursuit of Educational Equity: An Overview,” in *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*, ed. John Yinger (Cambridge, MA: The MIT Press, 2004), 3-57.

refers to what needs to be distributed equitably across districts and students. The object of equity is also sometimes thought of as the measure of the quantity and quality of education that is provided by a district or to a student.<sup>2</sup> The standard of equity describes the ideal distribution across districts or students of whatever object is specified. The school finance literature has defined and used a number of different objects and standards, which in different combinations define a variety of equity conceptions.

### **Objects of Equity**

Different authors list the possible objects of equity or measures of education in slightly different ways.<sup>3</sup> For purposes of this section we distinguish four different objects of equity: spending, real resources, educational opportunities, and student outcomes.

*Spending per pupil* is a simple measure of education, but is widely regarded as inadequate.<sup>4</sup> Spending per pupil is not a good indicator of the quality of education in a district for several reasons. First, districts located in different regions might face different competitive wages and other input prices. As a result, different districts that spend the same per pupil will not necessarily be able to provide the same quality and quantity of resources. Also, the types of students a district serves may influence the desirability of working in a district, and as a result, districts that serve students that present extra challenges will have to pay more to attract high quality teachers.<sup>5</sup>

Measures of *real resources* include pupil-teacher ratios, indicators of teacher quality, and direct measures of other educational inputs that influence the quality of educational programming that a district can offer. Because different educational inputs are typically measured in non-comparable units, and the contribution of specific inputs to educational quality is difficult to determine, aggregating various input measures into a single measure of education is challenging. One approach to developing a comprehensive measure of real resources is to adjust spending per pupil for differences in the wages districts have to pay to attract teachers of a given

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<sup>2</sup> See Yinger, "State Aid and the Pursuit of Educational Equity."

<sup>3</sup> See Baker and Green, "Conceptions of Equity and Adequacy in School Finance;" Berne and Stiefel, *The Measurement of Equity in School Finance*; Berne and Stiefel, "Concepts of School Finance Equity;" Robert Bifulco, "District Level Black-White Funding Disparities in the United States, 1987-2002," *Journal of Education Finance* 31, no. 2 (Fall 2005): 172-194; and Yinger, "State Aid and the Pursuit of Educational Equity."

<sup>4</sup> Yinger, "State Aid and the Pursuit of Educational Equity."

<sup>5</sup> See Jay G. Chambers, "Geographic Variation in Public School Costs," Working Paper 98-04 (Washington DC: U.S. Department of Education, National Center for Education Statistics, 1998). <http://nces.ed.gov/pubsearch/>; and William D. Duncombe and John M. Yinger, "Performance Standards and Educational Cost Indexes: You Can't Have One without the Other," in *Equity and Adequacy in Education Finance*, eds. Helen F. Ladd, Rosemary Chalk, and Janet S. Hansen (Washington, DC: National Academy Press, 1999), 260-297.

quality.<sup>6</sup> Several analysts have attempted to develop teacher wage indices that can be used for this purpose.<sup>7</sup> Development of teacher wage indices is fraught with technical challenges,<sup>8</sup> but conceptually, spending per pupil adjusted for differences in input prices provides a measure of education that is superior to nominal spending per pupil.

Many argue that the objective of school finance is not primarily to achieve an equitable distribution of resources, but rather an equitable distribution of *opportunities*.<sup>9</sup> The notion of an opportunity is difficult to define. One definition, based roughly on the normative work of John Roemer,<sup>10</sup> entails having access to a set of services sufficient to provide a reasonable expectation of achieving educational outcomes provided an individual makes a reasonable effort. For several reasons, real resources are not necessarily a good indication of opportunities defined this way. First, structural aspects of a district can influence the amount of resources required to provide a given level of service. For instance, the geographic dispersion of the population that a district serves can affect the amount of resources it needs to devote to transportation and constrain the ability to share staff across schools, and thereby affect the amount of resources needed to provide a given level of educational services. Also, districts serving a small number of students may not be able to exploit economies of scale and thus need to spend more to provide a given set of services. Second, students with special needs need access to a broader array and perhaps more intensive set of services than other students in order to have a reasonable expectation of achieving a given outcome. Thus, districts with a concentration of high need students will need more resources than other districts to provide their students a given level of educational opportunity.

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<sup>6</sup> Adjustments for prices of other inputs, such as utility charges, can also be used. However, teacher compensation constitutes a large portion of school districts budgets, differences in teacher wages tend to be highly correlated with wages for other school personnel, and many non-personnel inputs are sold in national markets with little variation in prices across regions. Thus, adjusting for teacher wages has received the most attention in the school finance literature.

<sup>7</sup> See, for instance, Chambers, "Geographic Variation in Public School Costs;" and Lori L. Taylor, "Adjusting for Geographic Variations in Teacher Compensation: Updating the Texas Cost-of-Education Index" (Texas Joint Select Committee on Public School Finance, 2004).

<sup>8</sup> William D. Duncombe and Dan Goldhaber, "Estimating Geographic Cost of Education Differences: A Case Study of Maryland," paper presented at the Annual Meeting of the Association for Budget and Financial Management, Chicago, 2004. Lori L. Taylor and William J. Fowler, "A Comparable Wage Approach to Geographic Cost Adjustment," (Washington DC: National Center for Education Statistics Research and Development Report # 2006-321, 2006).

<sup>9</sup> Baker and Green, "Conceptions of Equity and Adequacy in School Finance;" Bifulco, "District Level Black-White Funding Disparities in the United States;" William D. Duncombe and John M. Yinger, "School Finance Reform: Aid Formulas and Equity Objectives," *National Tax Journal* 51, no. 2 (June 1998), 239-262; Helen F. Ladd and John M. Yinger, "The Case for Equalizing Aid," *National Tax Journal* 47, no. 1 (March 1998), 211-224; Andrew Reschovsky, "Fiscal Equalization and School Finance," *National Tax Journal* 47, no. 1 (March 1998), 185-198.

<sup>10</sup> John E. Roemer, *Equality of Opportunity* (Cambridge, MA: Harvard University Press, 1998).

Educational systems are ultimately concerned with achieving *student outcomes*, and thus, school finance programs should be focused on achieving an equitable distribution of outcomes. However, because outcomes are determined by a combination of the services provided by a school district, the educational supports provided at home, and a student's level of effort, school finance policy alone is likely insufficient to achieve a desirable distribution of education outcomes. Thus, by focusing on the quality and appropriateness of educational services, and on providing a reasonable expectation of achieving outcomes given a reasonable level of student effort, the notion of opportunities provides a more appropriate object than outcomes for defining school finance equity.

### **Standards of Equity**

At least four standards of equity have been discussed in court opinions and the scholarly literature—equality, access equality, wealth neutrality and adequacy.<sup>11</sup> The standard of *equality* is satisfied when all districts provide the same level of education--measured as either spending, resources, opportunities or outcomes. Several state courts have recognized equality as a constitutional standard, although these courts have not often been clear about what object needs to be distributed equally.<sup>12</sup>

*Access equality*, which played an important role in early school finance litigation,<sup>13</sup> is obtained when a given increase in local tax effort, often defined as taxes levied per dollar of property value or income, produces the same amount of revenue for all districts.<sup>14</sup> Access equality in this sense means only that local taxpayers have access to equal taxable wealth that can be, but need not be used to finance local public schools. This type of access equality does not guarantee that children have access to comparable local public schools.

*Wealth neutrality*, is related to, but distinct from the standard of access equality. Wealth neutrality exists when the level of education in a district, measured by spending, resources, opportunities or outcomes, is unrelated to the level of district wealth. The early school finance literature did not distinguish between wealth neutrality and access equality (see, for instance,

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<sup>11</sup> See Anna Lukemeyer, *Courts as Policymakers: School Finance Reform Litigation* (New York: LFB Scholarly Publishing, 2003); and Anna Lukemeyer, "Financing a Constitutional Education: Views from the Bench," in *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*, ed. John Yinger (Cambridge, MA: The MIT Press, 2004): 59-85.

<sup>12</sup> Lukemeyer, "Financing a Constitutional Education: Views from the Bench."

<sup>13</sup> Jon Stonsteli, Eric Brunner, and Kenneth Ardon, *For Better or for Worse? School Finance Reform in California* (San Francisco, CA: Public Policy Institute of California, 2000).

<sup>14</sup> Yinger, "State Aid and the Pursuit of Educational Equity."

Coons, Clune, and Sugarman, 1970).<sup>15</sup> However, economist Martin Feldstein demonstrated that even when districts are able to raise the same amount of revenue with equal tax effort, not all districts will choose the same amount spending.<sup>16</sup> Thus, although access equality ensures that all districts face the same budget constraint, it does not ensure that wealth and spending will be uncorrelated. Wealth neutrality does not guarantee the elimination of vast disparities in educational resources, but rather, only that those disparities are not systematically associated with measures of local community wealth or income.

Finally, an *adequacy* standard demands that every district provide an education that meets some minimum standard which may either be expressed as a defined set of spending, real resources, or more commonly in recent years, a measurable educational outcome expectation. A key issue in defining a specific adequacy standard is how high to set that minimum.

### Which Conceptions of Equity are Most Relevant for Connecticut

Often underappreciated in court decisions in school finance cases is that any standard of equity can be combined with any of the objects of equity. Any impression that an equality standard, for instance, is logically associated with spending or resource measures, or that an adequacy standard entails outcomes as the object of equity, is incorrect. As indicated in Table 1.1, the four objects of equity defined above and the four standards of equity can be combined to generate 16 different conceptions of equity. The three that are most relevant for Connecticut, including equality of opportunity, adequacy of resources and adequacy of opportunities, are highlighted in Table 1.1.

**Table 1.1 – Conceptions of Equity**

Standard of Equity	Object of Equity			
	Spending	Resources	Opportunities	Outcomes
Equality			Equality of Opportunity	
Access Equality				
Wealth Neutrality				
Adequacy		Adequacy of Resources	Adequacy of Opportunity	

<sup>15</sup> See, for instance, John Coons, William H. Clune III, and Stephen D. Sugarman, *Private Wealth and Public Education* (Cambridge, MA: Harvard University Press, 1970).

<sup>16</sup> Martin Feldstein, “Wealth Neutrality and Local Choice in Education,” *American Economic Review* 61, no. 1 (March 1975): 75-89.

*Horton I* establishes that the state has a constitutional responsibility to provide “substantially equal educational opportunities.”<sup>17</sup> Whether educational opportunities guaranteed by *Horton I* exactly matches the definition of opportunities provided above is unclear, but in the ruling the court indicated that it was not concerned with equalizing education spending for its own sake but because “there is a direct relationship between per pupil school expenditures and the breadth and quality of educational programs.”<sup>18</sup> That is, spending equality is not the relevant equity conception. The ruling also states that the “state may recognize differences in educational costs based on relevant economic and educational factors” suggesting a standard of equality of opportunity as defined above.<sup>19</sup> In the words of a recent ruling by the trial court in the current case, “The Court was not concerned with equalizing education spending among towns for its own sake but” with “the breadth and quality of educational programs.”<sup>20</sup> In what follows, we take these determinations by the court as a guide to what types of analyses are relevant for the present case.

Also in a recent ruling in the current case, the state’s Supreme Court affirmed that the state constitution “guarantees students in our state’s public schools the right to a particular minimum quality of education, namely, suitable educational opportunities.”<sup>21</sup> More specifically, the court concluded that “the Connecticut constitution guarantees Connecticut’s public school students educational standards and resources suitable to participate in democratic institutions, and to prepare them to attain productive employment and otherwise to contribute to the state’s economy, or to progress on to higher education.”<sup>22</sup> This language implies a minimum educational adequacy standard, expressed consistently with language used by courts in many other states where adequacy claims have previously been litigated.<sup>23</sup>

## 1.2 Prototypical School Aid Formulas

In this section, we describe two prototypical school aid formulas that have been widely discussed in the school finance literature—foundation aid and guaranteed tax base formulas. The

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<sup>17</sup> See *Horton v. Meskill*, 172 Conn. 615 (Connecticut 1977).

<sup>18</sup> *Id.*, 635.

<sup>19</sup> *Horton v. Meskill*, 172 Conn. 615, 376 A.2d at 376 (Connecticut 1977)

<sup>20</sup> *Carroll-Hall v. Rell*, Memorandum of Decision on Motion to Strike, September 17, 2007, p. 4.

<sup>21</sup> Connecticut Coalition For Justice in Education Funding, Inc. v. Rell (Sc 18032), released March 30, 2010.

<sup>22</sup> *Ibid.*

<sup>23</sup> Bruce D. Baker and Preston C. Green, “Conceptions, Measurement and Application of Educational Adequacy Standards,” *AERA Handbook on Education Policy*, ed. David N. Plank (New York: Routledge, 2009): 438-452

school aid formulas used in most states can be interpreted as one or the other or some combination of these two formulas, although few states use the formulas in the prototypical forms describe here.<sup>24</sup> The prototypical formulas, however, have clear links to the conceptions of equity described in the previous section, and thus, are useful for assessing the specific formulas used by states.

### Foundation Aid

In its simplest form, a foundation aid formula can be written as:

$$A_i = F^* - t^* \bar{V}_i$$

where  $A_i$  is the per pupil state aid award for district  $i$ ,  $F^*$  is a foundation amount of spending specified by state policy makers,  $t^*$  is a state determined minimal tax rate, and  $\bar{V}_i$  is the property value per pupil in district  $i$ . This formula ensures that every district receives enough state aid to raise the foundation level of school funding at a tax rate that the state determines is reasonable. The foundation drives larger aid awards toward districts with lower per pupil property values, and the total amount of aid provided depends on how high the foundation and state specified tax rate are set.

To see how the foundation formula works, suppose that a state decides that \$12,000 is a minimally adequate level of spending and that \$1 per \$100 of property value per pupil is a reasonable tax rate. Consider a particular district that has property value per pupil equal to \$850,000. That district would be eligible for aid equal to:

$$A_i = \$12,000 - 0.01(\$850,000) = \$12,000 - \$8,500 = \$3,500$$

Increasing the foundation amount by \$1,000 would increase the aid that this district is eligible for by \$1,000. Alternatively, increasing the expected local tax effort from \$1 dollar per \$100 of per pupil property value to \$1.25 dollars per \$100 would decrease the amount of aid the district received to \$1,375:

$$A_i = \$12,000 - 0.0125(\$850,000) = \$12,000 - \$10,625 = \$1,375$$

As illustrated below, holding the foundation amount and expected local tax rate constant, wealthier districts receive less aid and poorer districts receive more aid per pupil:

$$A_i = \$12,000 - 0.01(\$1,000,000) = \$12,000 - \$10,000 = \$2,000$$

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<sup>24</sup> Yao Huang, "A Guide to State Operating Aid Programs for Elementary and Secondary Education," in *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*, ed. John Yinger (Cambridge, MA: The MIT Press, 2004): 331-351.

$$A_i = \$12,000 - 0.01(\$500,000) = \$12,000 - \$5,000 = \$7,000$$

If the foundation amount is set equal to what the state determines is a minimally adequate level of spending, then the foundation formula is clearly linked to the goal of ensuring all districts have adequate spending. The foundation formula as expressed above, however, is extremely limited in its ability to address adequacy of resources or opportunities. The foundation formula above merely guarantees that all districts regardless of location or children served can achieve a specific level of nominal dollars per pupil. Helen Ladd and John Yinger have demonstrated how a foundation formula can be altered to help ensure adequate resources or adequate educational opportunities for all districts.<sup>25</sup> Table 1.2 below summarizes the typical components of state school finance formulas required to achieve adequate resources or opportunities for each school district.

**Table 1.2 – Elements of Foundation Formula Designed to Achieve Equality and Adequacy of Resources and Opportunities**

<b>Foundation formula element</b>	<b>Purpose</b>	<b>Notes</b>
<b>Foundation Level</b>	Intended to represent cost of “adequate educational services” and/or cost of achieving “adequate educational outcomes” in either “average” or “lowest cost” district	w/o other considerations, guarantees only equity of nominal financial inputs (equal dollars)
<b>Input Price (teacher wage) Adjustment</b>	Intended to provide local public school districts sufficient funding to purchase comparable “real resources”	May attempt to account for differences in competitive wages & other input prices across regions, or may also attempt to account for influence of local working conditions on wages required to hire high quality teachers.
<b>Student Need Adjustments</b>	Intended to provide for “equal educational opportunity” by providing financial resources to achieve appropriately differentiated programs (program intensity)	

<sup>25</sup> Ladd and Yinger, “The Case for Equalizing Aid.”



### **Input Price Adjustments to Foundation Formula: Equity of “Real Resources”**

Let  $W_i$  be a measure of how much a district has to pay in wages to attract a sufficient number of teachers of a given quality, expressed as a proportion of how much the average district in the state needs to spend.<sup>26</sup> Then we can revise the foundation formula as:

$$A_i = F * W_i - t * \bar{V}_i$$

$F * W_i$  is a measure of real resources and thus allows the foundation amount to be expressed as the spending required to provide minimally adequate resources, which differs across districts.

The wage index,  $W_i$ , can reflect (1) differences in professional wages across regional labor markets, or (2) these regional wage differences plus the additional amount a district has to pay teachers to compensate for differences in working conditions particular to the district. The first type of wage index will only vary across regional labor markets and be constant within local labor markets. The second type of wage index will vary across districts within regional labor markets as well as across markets. Both types of index reflect factors beyond the control of an individual district, and thus, a district’s index value is not influenced by the particular collective bargaining agreements it negotiates with its union. If the wage index alone is used to adjust the foundation with the intention of estimating an adequate level of real resources, then that wage index should reflect both regional wage differences and the effects of district specific working conditions since both influence the amount of spending a district would have to do to acquire a given amount of resources.

To continue the illustration above, suppose the foundation is set equal to \$12,000, the expected tax rate,  $t^*$ , equals 0.01, and consider two districts, A and B, each with \$850,000 in property value per pupil. Suppose the teacher wage index for District A is equal to 1.20, indicating that teacher wages faced by District A are 20 percent higher than in the average district. The wage index for District B equals 1.00, indicating that the wages it faces are equal to the statewide average. A resource foundation formula would drive more aid toward the district that faces higher wages, and thus, higher resources costs.

$$\text{District A: } A_i = \$12,000 * 1.20 - 0.01(\$850,000) = \$14,400 - \$8,500 = \$5,900$$

$$\text{District B: } A_i = \$12,000 * 1.00 - 0.01(\$850,000) = \$12,000 - \$8,500 = \$3,500$$

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<sup>26</sup> For examples of wages indices of this kind that have been developed with funding from the National Center for Education Statistics see <http://nces.ed.gov/edfin/adjustments.asp>.

In this example, the foundation amount, \$12,000, represents the amount the average district in the state has to spend to provide an adequate amount of resources, and,  $\$12,000 * 1.20 = \$14,400$  represents the amount District A has to spend to provide an adequate amount of resources.<sup>27</sup> An adequate amount of resources costs more for District A than the average district because it operates in an environment where competitive wages are significantly higher than in the average district's environment. A resource foundation formula would drive more aid to the district that faces higher resource costs, holding per pupil property values constant.

### **Student Need Adjustments to Foundation Formula: Equity of Opportunity**

To target a minimum level of educational opportunities to each district, the foundation target for each district must account for additional factors beyond teacher wages that influence how much a district needs to spend to provide a set of services that will give its students a reasonable expectation of achieving outcome standards. These additional factors are discussed above and include district size, population sparsity, the proportion of special need students, and the proportion of low-income families in the district. Several studies have demonstrated how to develop a comprehensive cost index, say  $C_i$ , which expresses how much it costs a particular school district to provide a given level of educational opportunities as a proportion of how much that would cost in the average district.<sup>28</sup> Using such a comprehensive cost of education index, the foundation formula can be rewritten as:

$$A_i = F * C_i - t * \bar{V}_i$$

Alternatively, one can decompose the cost adjustment in the aid formula into the constituent cost factors. In this case, an index,  $W_i$ , which indicates the wage costs in district  $i$  as

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<sup>27</sup> These amounts will be sufficient to provide adequate opportunities only if we assume that neither district requires additional resources to address concentrations of high need students.

<sup>28</sup> For examples of how such indices can be estimated see Thomas A. Downes and Thomas F. Pogue, "Accounting for Fiscal Capacity and Need in the Design of School Aid Formulas," *National Tax Journal* 47, no. 1(March 1994): 89-110; William D. Duncombe, "Estimating the Cost of an Adequate Education in New York." Working paper no. 44, Center for Policy Research, Maxwell School of Citizenship and Public Affairs, Syracuse University, Syracuse, NY; William D. Duncombe and John M. Yinger, "Why Is it So Hard to Help Central City Schools?" *Journal of Policy Analysis and Management* 16, no. 1 (Winter 1997): 85-113; Duncombe and Yinger, "School Finance Reform: Aid Formulas and Equity Objectives;" William D. Duncombe and John M. Yinger, "Financing Higher Student Performance Standards: The Case of New York State," *Economics of Education Review* 19, no. 4 (October 2000): 363-386; Andrew Reschovsky and Jennifer Imazeki, "The Development of School Finance Formualas to Guarantee the Provision of Adequate Education to Low-Income Students," in *Developments in School Finance, 1997: Does Money Matter*, ed. William J. Fowler Jr. (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 1998); Andrew Reschovsky and Jennifer Imazeki, *Developing a Cost Index for School Districts in Illinois*, report submitted to the Illinois State Board of Education (Madison, WI: La Follette School of Public Afffiars, University of Wisconsin-Madison, 2000); Andrew Reschovsky and Jennifer Imazeki, "Achieving Educational Adequacy through School Finance Reform," *Journal of Education Finance* 26, no. 4 (Spring, 2001): 373-396; Andrew Reschovsky and Jennifer Imazeki, "Let No Child Be Left Behind: Determining the Cost of Improving Student Performance," *Public Finance Review* 31, no. 3 (May 2003): 263-290.

a proportion of wage costs in the baseline district, is needed<sup>29</sup> as are a set of pupil weights,  $\Omega^P$ ,  $\Omega^L$ , and  $\Omega^D$ , which indicate how much more it costs to provide the average poor student, limited English proficiency student and a special education student a reasonable expectation of achieving outcomes standards than the average student without special needs.<sup>30</sup> The formula becomes:

$$A_i = F * W_i(1 + \Omega) - t * V_i$$

$$\Omega = P_i \Omega^P + L_i \Omega^L + D_i \Omega^D$$

where  $P_i$ ,  $L_i$ , and  $D_i$  are the proportions of students in district  $i$  who are poor, limited English proficient and disabled. Assuming  $C_i$  includes the differences in costs due to wage differences and student needs, these two approaches are equivalent. However, the latter approach has the advantage of making the cost adjustments used in the formula more transparent.

To illustrate, again suppose the foundation amount is set equal to \$12,000 and the expected local tax rate is set equal to 0.01, and consider two districts, C and D, who each have average wage costs and per pupil property value equal to \$850,000. District C has no LEP students and low percentages of poor and special education students, 2.5 percent in each category. District D, however, has more students in high need categories including 50 percent poor, 10 percent LEP, and 10 percent disabled. Assume also that the average poor, LEP and disabled students each cost twice as much to educate as students not in any of those categories. An opportunity foundation formula would drive more per pupil aid to the district with high proportions of students in need categories:

$$\begin{aligned} \text{District C: } A_i &= \$12,000 * 1.00 * (1 + 0.025 * 1.0 + 0.00 * 1.0 + 0.025 * 1.0) - 0.01(\$850,000) \\ &= \$12,000(1.05) - \$8,500 \\ &= \$12,600 - \$8,500 = \$4,100 \end{aligned}$$

$$\text{District D: } A_i = \$12,000 * 1.00 * (1 + 0.50 * 1.0 + 0.10 * 1.0 + 0.10 * 1.0) - 0.01(\$850,000)$$

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<sup>29</sup> Whether the wage index should reflect only differences in professional wages across regional labor markets or also differences in working conditions across districts within regions depends on whether or not the weights used for high need students are designed to reflect the additional cost of hiring teachers of a given quality in high need districts. If this additional cost is part of what the weights on student need categories capture, then the wage index should only reflect differences in professional wages across regions.

<sup>30</sup> Adjustments for the fact that very small districts face higher per pupil costs might also be incorporated into the formula. However, it is not clear that a cost adjustment for size is appropriate because the cost disadvantage of small districts can be eliminated in many cases through district consolidation. If that is true, a state is wasting money by rewarding districts that refuse to consolidate. Similarly, one must be careful to determine the percentage of disabled students in a district in a way that does not create incentives for districts to make unwarranted referrals for special education services.

$$\begin{aligned}
&= \$12,000(1.70) - \$8,500 \\
&= \$20,400 - \$8,500 = \$11,900
\end{aligned}$$

In this example, \$12,000 represents the foundation amount of spending in a district that faces average wage costs and serves no students in special needs categories. \$12,600 is the per pupil foundation for the District C, which has relatively few students in need categories, and \$20,400 is the foundation target for District D, which has larger proportions of students in need categories. Given the high levels of need in District D, it must provide an extensive set of services to provide its students a reasonable expectation of achieving standards, and an opportunity foundation formula drives relatively high amounts of state aid to that district to allow it to meet the high service needs at a reasonable tax rate.

The connection between the foundation formula and adequacy standards of equity is clear. A foundation aid program, however, will guarantee adequate education in each district only if: (1) the foundation level,  $F^*$ , is set high enough for a district with average costs to provide an adequate education; (2) the wage index and student need weights,  $W_i$ ,  $\Omega^P$ ,  $\Omega^L$ , and  $\Omega^D$ , accurately reflect the additional costs with operating in high wage and high need environments; (3) districts are required to levy at least the state specified tax rate,  $t^*$ ; and (4) districts use the funding they raise through local taxes and state aid efficiently. The first three conditions are subject to direct policy control by state officials. District efficiency is not under the direct control of state policy makers, but can be influenced by school accountability and other educational policies.

### **Using the Foundation Formula to Promote an Equal Education Standard**

A foundation aid program can also be used to promote the goal of equal education, as well as an adequacy standard. To achieve educational equality across districts, however, a state would have to proscribe districts from spending more than the foundation amount. Yinger explains how an equality goal can be achieved through a foundation aid program. Such a program would require any district that can raise more than its adjusted foundation amount at the state specified tax rate to make payments to the state for purposes of redistribution to high need and/or low wealth districts.<sup>31</sup>

So, for instance, suppose the foundation level is set at \$12,000 and the expected local tax rate is set at 0.01. Consider a district with average wage costs, 5 percent poor students, 5 percent LEP students, 5 percent of students classified as disabled, and \$1,500,000 in per pupil property value. The opportunity aid formula produces a negative amount of aid for this hypothetical district:

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<sup>31</sup> Yinger, "State Aid and the Pursuit of Educational Equity."

$$\begin{aligned}
A_i &= \$12,000 * 1.00 * (1 + 0.05 * 1.0 + 0.05 * 1.0 + 0.05 * 1.0) - 0.01(\$1,500,000) \\
&= \$12,000(1.15) - \$15,000 \\
&= \$13,800 - \$15,000 = -\$1,200
\end{aligned}$$

To achieve an equal opportunity standard, this district would be required to tax its residents at \$1 per \$100 of per pupil property value, and send \$1,200 per pupil to the state for purposes of redistribution to other low wealth, high need districts. Essentially some districts would be subject to negative state aid. Such a policy is effectively the same as adopting a statewide property tax to fund schools, and using the centrally raised revenue to provide each district funding equal to  $F * C_i$ , the state determined foundation times the district specific cost of education.

### Guaranteed Tax Base Formula

The second prototypical aid formula is the guaranteed tax base (GTB) formula, also known as a power equalizing formula. A GTB formula is designed to ensure that any two districts that tax property value at the same rate will receive the same amount of revenue. Thus, the GTB formula is explicitly designed to achieve an access equality standard. The GTB formula can be written as:

$$A_i = E_i \left( 1 - \frac{\bar{V}_i}{\bar{V}^*} \right)$$

where  $A_i$  is the per pupil state aid award for district  $i$ ,  $E_i$  is how much district  $i$  chooses to spend on education,  $\bar{V}_i$  is the property value per pupil in district  $i$ , and  $\bar{V}^*$  is the per pupil property tax base that the state has chosen to guarantee.

A crucial difference between foundation aid and GTB aid, is that a foundation aid program provides lump-sum grants that are not influenced by district decisions about how much to spend on education, while a GTB program provides matching aid, the amount of which depends on how much the district spends. Essentially, the GTB formula matches each dollar raised in local tax revenue using a matching rate that is inversely related to district wealth.

Suppose the guarantee wealth level,  $\bar{V}^*$ , is set equal to \$1,500,000 per pupil (which is roughly 1.75 times the median wealth level in the state), and that a particular district has per pupil property value equal to \$750,000 and chooses to spend \$12,000 on schools. The guaranteed tax base formula would reimburse the district \$0.50 for each dollar that it spends. Thus, the district would receive \$6,000 in state aid:

$$A_i = \$12,000 * (1 - \$750,000 / \$1,500,000) = \$12,000 * (0.5) = \$6,000$$

If the district chooses to spend more, say \$15,000 per pupil, it would receive more in aid:

$$A_i = \$15,000*(1-\$750,000/\$1,500,000) = \$15,000*(0.5)=\$7,500$$

By matching district spending at a specified rate, the GTB formula effectively lowers the price districts pay for additional education, increasing the amount they are willing to spend.

The matching rate implied by the GTB formula is higher for low wealth districts and lower for high wealth districts. Consider, for instance, districts E and F, both of which choose to spend \$12,000 per pupil, but one of which is much wealthier than the other—District E has per pupil property values equal to \$1,200,000 and District F has per pupil property value equal to \$600,000.

$$\text{District E: } A_i = \$12,000*(1-\$1,200,000/\$1,500,000) = \$12,000*(0.2) = \$2,400$$

$$\text{District F: } A_i = \$12,000*(1-\$600,000/\$1,500,000) = \$12,000*(0.6) = \$7,200$$

By linking the matching rate to a district wealth level, the GTB drives more state aid to low wealth districts than high wealth districts, holding expenditure choices constant.<sup>32</sup>

If  $\bar{V}^*$ , the guaranteed wealth level, in the above formula is set lower than the property value in the wealthiest district, a GTB aid program will only provide access equality among districts with per pupil property values equal to or less than the guaranteed wealth level. Districts with per pupil property wealth greater than the guaranteed wealth level will be able to raise more revenue at a given tax rate than other districts.

A guaranteed tax base program can ensure access equality across all districts in one of two ways. First, it can set the guaranteed wealth level equal to property value per pupil in the wealthiest district in the state. Alternatively, the state can set the guaranteed wealth level below the per pupil property value in the wealthiest district, and allow negative aid (sometimes called recapture) for districts whose property value exceeds the guaranteed wealth level. Note, if  $\bar{V}_i$ , the district wealth level, exceeds  $\bar{V}^*$ , the guaranteed wealth level, the GTB formula above implies that the district aid award,  $A_i$ , is negative. For example, consider a GTB formula with a guaranteed wealth level of \$1,500,000 and a district with \$1,875,000 in per pupil property value that chooses to spend \$12,000 per pupil:

$$A_i = \$12,000*(1-\$1,875,000/\$1,500,000) = \$12,000*(-0.25) = - \$3,000$$

Negative aid implies that a portion of every dollar the district raises in local tax revenues, in this case \$0.25, would need to be paid to the state for purposes of redistribution. Such a policy is often referred to as “recapture” and has been implemented in Texas and Vermont.<sup>33</sup>

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<sup>32</sup> It is unlikely, however, that a wealthy district and a poor district would choose to spend the same amount per pupil on education, see Feldstein, “Wealth Neutrality and Local Choice in Education.”

The GTB formula just described only ensures equality of access to spending. Ladd and Yinger, however, show how the GTB formula can be modified to achieve equality access to resource or opportunities. Equality of access to resources can be achieved by multiplying  $E_i$  in the above equation by  $W_i$ , a wage index. Equality of access to educational opportunities can be achieved by multiplying  $E_i$  by  $C_i$ , a comprehensive cost of education index of the type referenced above.<sup>34</sup>

As explained above, even if the GTB formula is able to achieve equality of access, equality of access does not necessarily result in wealth neutrality. Duncombe and Yinger (1998) discuss how the GTB formula can be modified to achieve the goal of wealth neutrality and the related concept of fiscal neutrality. But even in a system that provides for both “equality of access” and yields “wealth neutrality,” educational opportunity may vary widely across children based simply on their location of residence and the choices of local voters to support taxation for local public schools.

### **Which Formula is Relevant for Connecticut?**

The Connecticut courts have most clearly recognized equality of educational opportunity and adequacy of either resources or opportunities as constitutional standards of equity. Thus, a foundation formula, which is most clearly linked to these standards, is most relevant for Connecticut. In the following sections, then, we assess the ECS formula by comparing it to the prototypical foundation formula.

### **1.3 The Educational Cost Sharing (ECS) Formula**

The base formula in the ECS program has three primary components: the foundation, the student need count, and the base aid ratio. The amount of aid district  $i$  is entitled to by the base aid formula is:

$$\text{Base Formula Aid}_i = \text{Foundation} \times \text{Need Students}_i \times \text{Base Aid Ratio}_i$$

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<sup>33</sup> Thomas Downes, “School Finance Reform and School Quality: Lessons from Vermont,” in *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*, ed. John Yinger (Cambridge, MA: The MIT Press, 2004): 283-313 and Jennifer Imazeki and Andrew Reschovsky, “Schools Finance Reform in Texas: A Never-Ending Story?” in *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity*, ed. John Yinger (Cambridge, MA: The MIT Press, 2004): 251-281.

<sup>34</sup> Ladd and Yinger, “The Case for Equalizing Aid.”

Beginning in 2007-08, *the foundation* was set to \$9,687. The *need student count* is a weighted count of resident students that gives poverty students and limited English proficient (LEP) students additional weight, and discounts resident students attending magnet schools.<sup>35</sup>

$$\text{Need Students} = \frac{\text{Resident Students} + .33 * \text{Poverty Count} + .15 * \text{LEP Count} - .25 * \text{Magnet Students}}{\text{Students}}$$

The *base aid ratio* depends on a measure of town wealth and the state guaranteed wealth level, *SGWL*.

$$\text{Base Aid Ratio} = \text{Greater of } .09 \text{ or } 1 - \text{Town Wealth} / \text{SGWL}$$

Town wealth is determined as a function of the town's property tax base and the income of its residents:

$$\text{Town Wealth} = \frac{\frac{\text{ENGL}}{\text{Student Need Count}} + \frac{\text{ENGL}}{\text{Population}}}{2} \times \text{Income Adjuster}$$

$$\text{Income Adjuster} = \frac{\frac{\text{PCI}}{\text{Highest Town PCI}} + \frac{\text{MHI}}{\text{Highest Town MHI}}}{2}$$

ENGL = Equalized Net Grand List

PCI = Per Capita Income

MHI = Median Household Income

The portion of the total foundation amount that the district is expected to cover, often referred to as the local fair share, is town wealth/SGWL. Beginning in 2007-2008, the *SGWL* was raised from 1.55 to 1.75 times the median wealth level in the state. This implies that the district with the median wealth level would be given  $1 - 1/1.75 = 42.86$  percent of the foundation times the student need count (i.e. the total foundation amount) in ECS aid, and is expected to cover the remaining 57.14 percent of the total foundation amount from other sources of funding. Wealthier districts receive a smaller percentage of the total foundation amount in aid and poorer districts receive a higher percentage. Those districts whose wealth is greater than 1.5925 times the median wealth level receive 9 percent of their total foundation amount in aid, which is the lowest percentage allowed under the current program. If the sliding scale for determining local share was extended across all districts according to their town wealth, many would be “negative aid” districts and others zero-aid districts. But, a policy decision was made to spend a share of available state aid on higher wealth districts, and guarantee a minimum aid allotment of 9%.

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<sup>35</sup> Resident students is the count of regular and special education students enrolled in public schools at town expense on October 1, see Lohman, “Education Cost Sharing Formula.”



The ECS formula can be recast in a form closer to the prototypical foundation aid formula as:

$$A_i = F^*(1 + \Omega_i) - t_i^* \bar{V}_i$$

where  $A_i$  is per pupil aid for district  $i$ ,

$F^* = \$9,867$  (the foundation amount),

$$(1 + \Omega) = 1 + .33P_i + .15L_i - .25M_i$$

where  $P_i$  = proportion of students in the district who are poor,

$L_i$  = proportion of students in the district who are LEP, and

$M_i$  = proportion of students in the district who attend magnet schools,

$\bar{V}_i$  is property value per resident student in district  $i$ , and

$t_i^*$  is district  $i$ 's specified tax effort (discussed below)

This reformulation of the ECS formula shows that it differs from the prototypical foundation formula in two ways. First, while the formula adjusts the foundation amount,  $F^*$ , for students' needs (through  $1 + \Omega_i$ ), it does not adjust the foundation for regional differences in competitive wages. Second, the tax rate that the state specifies for each district to determine its aid award varies by district, indicated by the subscript  $i$  on  $t^*$ .

More specifically  $t_i^*$  in the ECS formula can be expressed as:

$$t_i^* = \frac{F^*(1 + \Omega_i) \frac{\text{Town Wealth}_i}{SGWL}}{\bar{V}_i}$$

The numerator in this formula is the district's total foundation target,  $F^*(1 + \Omega_i)$ , multiplied by the local fair share,  $\frac{\text{Town Wealth}_i}{SGWL}$ . It makes sense to call this product the expected local contribution. Thus, the state specified tax effort is simply the expected local contribution expressed as a rate of per pupil property value. For the median wealth district the expected local share is currently 0.5714 and the expected local contribution is  $\$9,687 * 0.5714 = \$5,535$ . The median per pupil property wealth across all towns in the state is approximately \$825,000. Thus, the ECS formula implies a tax rate of 0.0067, or \$0.67 per \$100 in per pupil property value, for the district with the median property value.

The most important parameter in determining  $t_i^*$  is the state guaranteed wealth level,  $SGWL$ . If the  $SGWL$  is set higher than the current level of 1.75 the median district wealth, then the expected local contribution would decrease and the total per pupil amount of aid would

increase. If the *SGWL* is set lower, the expected local contribution would increase and the total per pupil amount of base formula aid would decrease.

That the ECS formula defines a local share for each district as a function of a guaranteed wealth level may make the formula appear similar to a guaranteed tax base formula. However, the local share term is only used to determine the local tax effort expected from a district to help cover the total foundation target. The local share term is not used to determine a matching rate for locally raised revenue and thus, is not used to guarantee equal revenue raising capacity across districts. Thus, any similarity between the ECS formula and a GTB formula is superficial.

#### **1.4 Irrationalities of the ECS Formula**

A number of features of the ECS program are not justified by appeal to any of the conceptions of equity defined above, and particularly the equality of educational opportunity or adequacy of resources or opportunity standards. The state has not established or used any documented, rational process to link these particular elements of the ECS program to a well-defined conception of equity, and thus, we refer to these features of the ECS program as irrationalities. Some of these irrationalities are features of the ECS base aid formula just described, and these irrationalities are discussed in this section. Other irrationalities result from the fact that the state aid awards that districts receive deviate from the amounts determined by the ECS base aid formula in ways that do not help to achieve any equity standards. These second set of irrationalities will be discussed in the next section.

As detailed in Table 1.3, the problems with ECS base aid formula are related to how the foundation amount is set, how the student need count is computed, the failure to adjust awards for regional differences in teacher wages, and how district wealth is computed.

**Table 1.3 – Features of ECS formula that are not determined by a rational process**

Feature of the ECS Formula	Process used:	Alternative Process:
<b>1. How foundation is set</b>	No documented process for establishing amount of spending required to provide an adequate education.	Define an adequate level of education in terms of outcomes students should have reasonable expectations of achieving.  Use study of educational costs to determine services, resources and/or spending required to provide student's a reasonable expectation of achieving adequate outcomes.
<b>2. How the student need count is computed</b>	Poverty and LEP students given extra weight in computing student need count.  Measures of poverty have not been updated regularly.  No documented process for estimating additional costs required to provide students in need categories a reasonable expectation of achieving adequate outcomes.	Use statistical models to estimate the historical relationship between spending, achievement and student needs (i.e cost function studies) or professional judgment studies to estimate the additional costs associated with providing poverty and LEP students a reasonable expectation of achieving adequate outcomes.
<b>3. No adjustment for regional wage differences</b>	No documented study by state of regional differences in competitive wages for professional occupations is used for purpose of determining aid amounts.	Use one of several established methods to estimate differences in competitive wages across different regions of the state.
<b>4. How district wealth is computed</b>	Including student need counts in computation of district wealth needlessly obscures the role that extra weights for need students plays in determining aid amounts.	Remove student need counts from the computation of district wealth, and use weights in student need count that accurately reflect the additional costs of educating need students.

**How the foundation is set**

In order to achieve an adequacy standard, a state must define an adequate level of education, and set the foundation amount in the ECS formula equal to the spending needed to achieve that level of education. If the standard is adequacy of resources, then the task is to define a minimally adequate level of resources and determine how much the average district needs to spend to acquire that level of resources. If the standard is adequacy of opportunities, then a state must define the outcomes students are expected to achieve and what would constitute

evidence that students in a district have reasonable expectations of achieving those standards. Then, the state would need to determine how much the average district needs to spend to provide that level of educational service. Key questions to ask in evaluating the ECS formula is how the foundation amount has been determined and whether it can reasonably be interpreted as the spending required to achieve an adequate level of education.

When it was first established in 1988, the ECS program required the foundation to be recalculated each year to equal the regular education expenditures per need student of the town where the 80<sup>th</sup> percentile total need student is located, when all towns are ranked from lowest to highest according to those expenditures (referred to hereafter as the “80<sup>th</sup> percentile town”).<sup>36</sup> Why the foundation was pegged to spending in the “80<sup>th</sup> percentile town” is unclear. It is also unclear how spending in the “80<sup>th</sup> percentile town” is related to the amount needed to provide minimally adequate resources or reasonable expectations of achieving minimum student outcomes.

The state, however, never did set the foundation equal to spending in the “80<sup>th</sup> percentile town.” When first adopted, the ECS program was to be phased-in between FY 1989-90 and FY 1993-94, and thus, in the first years of the program, districts never received the full difference between the proposed foundation and their expected local contribution. Before the program was fully implemented, the ECS foundation level was frozen at the FY 1992-93 level for FYs 1993-94 and 1994-95. Between FYs 1995-96 and 2006-07, the foundation level was increased only twice by a total of 3.15 percent.<sup>37</sup>

Figure 1.1 plots the foundation level used each year since 1992 along with net current expenditures per pupil in the lowest spending district in the state and in the district with net current expenditures per pupil equal to the 20<sup>th</sup> percentile, which is still well below the median. The 20<sup>th</sup> percentile spending approximates the targeted foundation specified in the original ECS legislation. From FY 1991-92 through FY 1995-96 the foundation level was very near the lowest level of net current expenditures per student in the state. Between FY 1996-97 and FY 2006-07, the foundation fell further and further below the lowest level of spending in the state. As of FY 2006-07, the foundation level (\$5,891) was less than 75 percent of the lowest amount spent by any town in the state during FY 2006-07 (\$8,163).

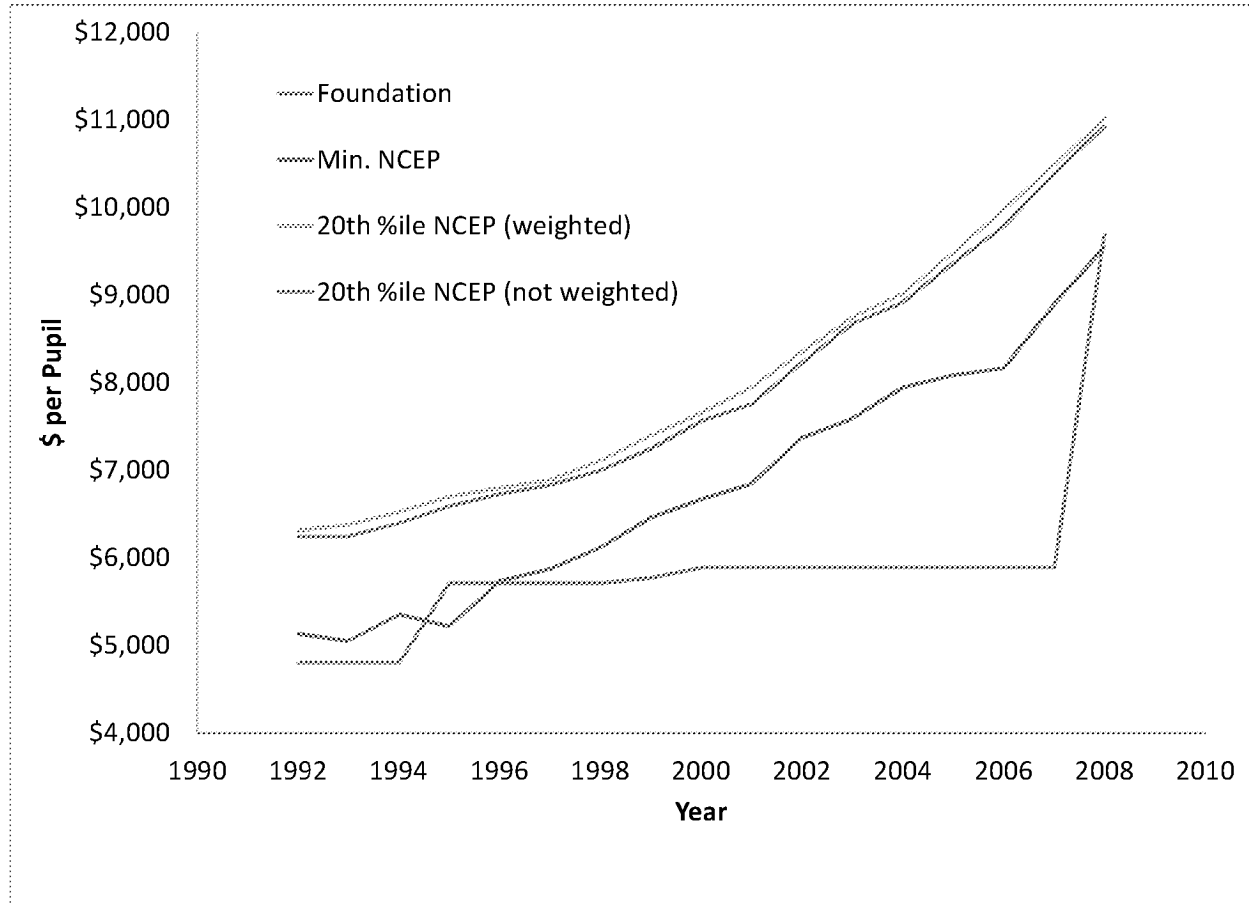
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<sup>36</sup> Judith Lohman, “ECS Formula Changes Since 1988” (Hartford, CT: Office of Legislative Research, 2004). <http://www.cga.ct.gov/ps99/rpt/olr/htm/99-r-1233.htm>. As described in the original Public Act 88-358

“...for the fiscal year ending June 30, 1994, and for each fiscal year thereafter, the regular program expenditures per need student of the town where the eightieth percentile total need student is located when all towns in the state are ranked from lowest to highest in regular program expenditures per need student, for the fiscal year three years prior to the fiscal year for which each town's entitlement is calculated pursuant to section 2 of this act.”

<sup>37</sup> Ibid.

**Figure 1.1 – History of the ECS Foundation Level**



*Data Source:* Net Current Expenditure and Average Daily Membership data from CT DOE. Foundation levels as reported in Lohman’s 1999 ECS Formula Changes Since 1988 (<http://www.cga.ct.gov/ps99/rpt/olr/htm/99-r-1233.htm>) & CTDOE Education Cost Sharing Program 2008-09. (<http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/mercesgd.pdf>)

Beginning in 2007-08, the foundation was increased to \$9,687. This amount appears to be based on the recommendation of Governor M. Jodi Rell’s Commission on Education Finance that “the foundation level should enable all towns to spend at a level of education equal to the amount spent for the 80<sup>th</sup> percentile need student three years prior.”<sup>38</sup> Again, why spending in the “80<sup>th</sup> percentile town” three years early was chosen or what relationship this amount has to the spending required to provide adequate educational resources or opportunities is unclear. It is worth noting that in 2008-09, per pupil spending in the median district was over \$12,000 per year and only two districts in the entire state spent less than \$10,000 per pupil. Thus, the current foundation amount is well below typical spending levels in the state. Because changes to the ECS formula adopted in FY 2007-08 are being phased-in, the new foundation amount net of the minimum expected local contribution will not serve as the amount of state aid that the district

<sup>38</sup> Governor M. Jodi Rell’s Commission on Education Finance, “Education Cost Sharing Grant Subcommittee Report,” accessed at <http://www.ct.gov/opm/lib/opm/budget/educationfinance/edufinancefinalreport.pdf>

receives for a number of years. By the time the formula is fully implemented, the \$9,687 foundation amount will be even further below typical spending levels in the state.

The state has never specified what a minimally adequate education entails or how much the typical districts would have to spend to provide this level of education. As a result, the foundation amount used in the ECS formula has no clear connection to any adequacy standard.

### **How the student need count is computed**

Three issues arise when using the student need count to adjust the foundation amount for differences in costs of educating high need students: choosing which classifications of students to assign extra weight; choosing measures of the number of students in those classifications; and choosing a weight for each classification. We discuss how each of these issues has been handled in the ECS program. The choice of weights for poverty and LEP students is particularly arbitrary and the most problematic aspect of the student need count.

Currently, poverty students, LEP students not served under a separate bilingual grant program, and magnet school students receive special weights in the student need count. At various times in the past, special education and low performing students have also been included.<sup>39</sup> LEP students require additional services and concentrations of low-income students are widely recognized as increasing the costs of providing services and increasing the amount of services needed to provide a district's students reasonable expectations of achieving standards. Thus, giving poverty and LEP students extra weight in the student need count does help to promote equity. Magnet school students generate state aid twice—for the district of residence and again for the magnet school the student attends. The negative weight on magnet students is not intended to address any particular equity goal, but rather to recapture from districts some of the additional state aid that magnet school students generate.

Like LEP students, special education students require additional services. However, a formula that generates additional state aid for districts with higher special education counts, can create undesirable incentives to classify students into special education categories.<sup>40,41</sup>

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<sup>39</sup> Lohman, "ECS Formula Changes Since 1988."

<sup>40</sup> Julie Berry Cullen and Randall Reback, "Tinkering toward accolades: school gaming under a performance accountability system" in *Improving School Accountability: Check-Ups or Choice, Advances in Applied Microeconomics*, eds. Timothy Gronberg and Daniel Jansen, (Amsterdam: Elsevier Science, 2006): 1-34 and David Figlio and Lawrence Getzler, "Accountability, Ability and Disability: Gaming the System?" in *Advances in Microeconomics*, ed. Timothy Gronberg, (Amsterdam: Elsevier Science, 2006).

<sup>41</sup> Such incentives do not always lead to undesirable changes in district behavior. Including special education students in the student need count might lead to appropriate classification of students who might otherwise be overlooked, see Bruce D. Baker and Matthew J. Ramsey, "What We Don't Know Can't Hurt Us? Evaluating the Equity Consequences of the Assumption of Uniform Distribution of Needs in Census Based Special Education Funding," *Journal of Education Finance* 35, no. 3 (2010): 245-275.

Nevertheless, including additional weights for students in special education classifications that are difficult to manipulate might help to better link a districts' need adjusted foundation amount to more accurately reflect what the district needs to spend to provide a given level of opportunities.

Extra weight for low performing students drives larger aid awards to districts with lower achievement levels, which creates a perverse incentive for districts. For instance, when low performing districts leverage their additional resources toward measurable improvement, resources are reduced. Thus, the choice to eliminate the extra weight for low performing students beginning in 2007-08 was sensible.

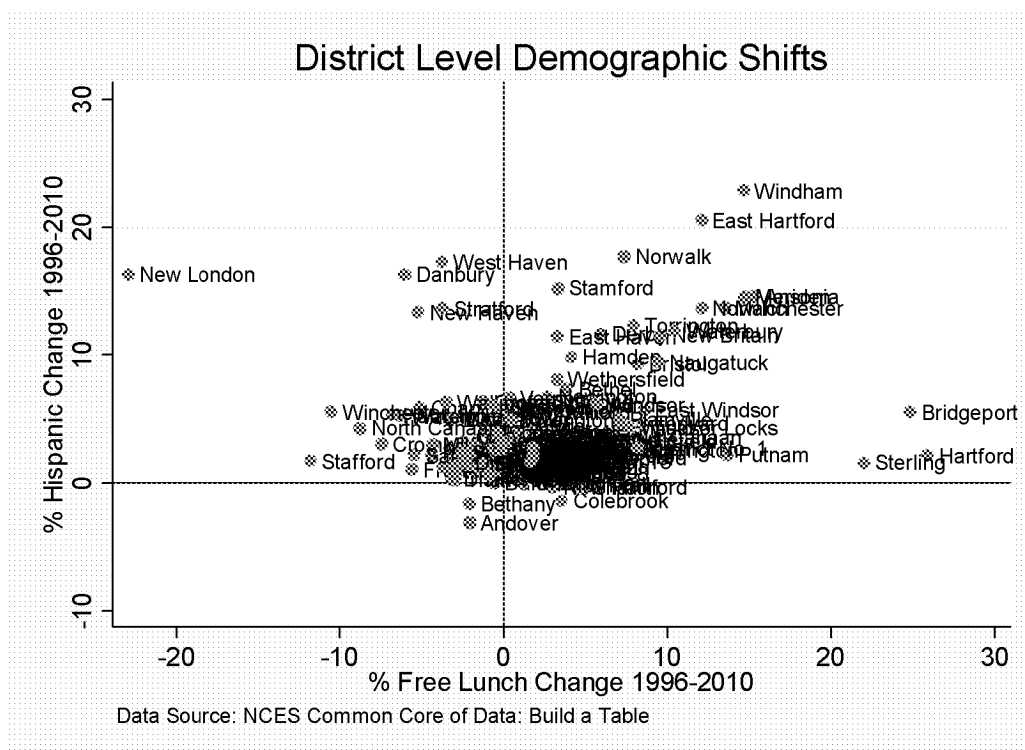
One problem with the ECS formula prior to the modifications made in 2007-08 was the measure of poverty students used in the student need count. As recently as FY 2006-07, the poverty measure was based on counts of students in the Temporary Family Assistance (TFA) program in 1996-97. Relying on outdated poverty measures means that districts with growing numbers of poverty students receive less aid than they need to provide an adequate education. Figure 1.2 shows that many districts have seen substantial increases in students in need categories. Particularly, the districts on the right most part of Figure 1.2, including Bridgeport, Hartford and Sterling, have seen large increases in percentages of low income students since 1996. Also, districts in the upper right part of Figure 1.2, including East Hartford, Windham, and Norwalk, have seen moderately large increases in the percentage of low-income students and large increases in the percentage of Hispanic students.<sup>42</sup> These districts are hurt most when the ECS base aid formula relies on outdated counts of students in need categories.

The measures used to identify the percentage of low-income students in a district must be chosen carefully to reflect a reasonable definition of poverty and to capture changes in poverty over time. The decision to replace 1996-97 TFA counts with 2005 Title I poverty counts beginning in FY 2007-08 was an improvement in the ECS formula. However, it remains important for the state to regularly update the poverty measure used in the student need count.

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<sup>42</sup> Counts of LEP students from earlier years are not readily available. However, increases in the percentages of Hispanic students might be accompanied by increase in the percentage LEP.

**Figure 1.2: District Level Demographic Shifts, 1996-2010**



The biggest problem with the student need count is that the additional weights for poverty and LEP students have not been determined by any documented, rational process. Ideally the weights used would reflect how much it costs to provide a set of services sufficient to provide the typical low-income (or LEP) student reasonable expectation of achieving outcome standards. Several approaches to estimating the additional cost of providing adequate service for low-income and LEP students have been developed. Perhaps the best developed and most widely used approaches are (1) studies that use statistical models to estimate the historical relationship between spending, achievement, and student needs, referred to as cost function studies, and (2) professional judgment studies. Estimates from published cost function studies indicate that it requires between 2 and 2.5 times as much spending to provide the average poor student an expectation of achieving standards equal to those of the average non-poor student (Downes & Pogue, 1994; Duncombe & Yinger, 2005; Reschovsky & Imazeki, 1998).<sup>43</sup> In a comprehensive

<sup>43</sup> Downes and Pogue, “Accounting for Fiscal Capacity and Need in the Design of School Aid Formulas,” William D. Duncombe and John M. Yinger, “How Much More Does a Disadvantaged Student Cost?” *Economics of Education Review* 24, no. 5 (October 2005): 513-532; Andrew Reschovsky and Jennifer Imazeki, “The Development of School Finance Formulas.”



review, Baker finds that professional judgment studies consistently estimate that low income students cost 60 to 70 percent more than non-poor students.<sup>44,45</sup>

The extra weights used in the current ECS formula are 0.33 for poverty students and 0.15 for LEP students. The poverty weight is certainly well below the range of weights that the best available research suggests are needed to capture the additional costs associated with low-income students. The basis for the weights used in the ECS formula is unclear. Governor Rell's Commission on Education Finance recommended a low-income student weight "close to 25 percent."<sup>46</sup> The Commission's report, however, does not provide any reason why that might be an appropriate weight.

As illustrated in Table 1.4, the districts hurt most because student poverty and LEP weights do not accurately reflect the costs of providing educational opportunities in the large city districts. The second and third columns of Table 1.4 present the foundation targets and base formula aid amounts under the 2008-09 ECS program. The fourth and fifth columns show the foundation targets and base formula aid amounts computed using extra poverty student and LEP weights equal to 1.0 each, leaving every other element of the base aid formula unchanged. The last column shows how much each district would gain if student need weights more accurately reflected the additional costs associated with poverty and LEP students.<sup>47</sup> The 17 districts that would gain more than \$1,000 per pupil in additional base formula aid if the alternative weights were adopted are listed in Table 1.4. The four districts that would gain the most are Hartford, New Haven, Waterbury, and Bridgeport. Table 1.4 makes clear that using student need weights that are well below estimated costs of educating high need students has the largest impacts on base aid amounts for the state's city districts.

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<sup>44</sup> Bruce D. Baker, "The Emerging Shape of Educational Adequacy: From Theoretical Assumptions to Empirical Evidence," *Journal of Education Finance* 30, no. 3 (Winter 2005): 259-287

<sup>45</sup> The appropriate weight depends in part on the measure of poverty used. The official federal poverty line and eligibility criteria for TFA are lower than the income cutoffs for free and reduced price lunch eligibility. As a result, the typical student from a family below the federal poverty line is substantially poorer than the typical student who is eligible for free or reduced price lunch. The additional resources and services required to provide the typical poor student adequate educational opportunities are likely greater than that required for the typical free-lunch eligible student. Ideally, separate weights would be assigned to students below the federal poverty line and students whose family income falls between the federal poverty line and eligibility cut-off for free and reduced price lunch.

<sup>46</sup> Governor M. Jodi Rell's Commission on Education Finance, "Education Cost Sharing Grant Subcommittee Report," accessed at <http://www.ct.gov/opm/lib/opm/budget/educationfinance/edufinancefinalreport.pdf>

<sup>47</sup> Note these calculations assume the foundation remains at \$9,687. If the foundation were increased to reflect typical spending levels in Connecticut, the additional aid to city districts would be even larger than shown in Table 1.4, both in absolute terms and relative to other districts.

**Table 1.4 – Effect of Changes in Student Need Weights on Base Formula Aid**

Town	Foundation Target, 2008-09 <sup>1</sup>	Base Formula Aid, 2008-09 <sup>2</sup>	Foundation Target with Alternate Student Need Weights <sup>3</sup>	Base Formula Aid with Alternate Student Need Weights <sup>3</sup>	Change in Aid Due to Change in Weights
Hartford	\$10,418	\$9,321	\$12,829	\$11,691	\$2,370
New Haven	\$10,380	\$8,738	\$12,745	\$11,052	\$2,314
Waterbury	\$10,503	\$9,025	\$12,677	\$11,152	\$2,127
Bridgeport	\$10,574	\$8,900	\$12,603	\$10,882	\$1,982
New Britain	\$10,437	\$8,984	\$12,335	\$10,845	\$1,860
New London	\$10,072	\$7,496	\$11,849	\$9,219	\$1,723
West Haven	\$10,152	\$7,389	\$11,737	\$8,919	\$1,530
Windham	\$10,426	\$9,043	\$11,953	\$10,542	\$1,499
Derby	\$10,200	\$6,039	\$11,714	\$7,482	\$1,443
Meriden	\$10,225	\$7,796	\$11,702	\$9,221	\$1,425
Ansonia	\$10,173	\$7,601	\$11,601	\$8,980	\$1,378
Putnam	\$10,303	\$7,258	\$11,703	\$8,604	\$1,346
East Hartford	\$10,026	\$7,446	\$11,349	\$8,719	\$1,273
Norwich	\$10,193	\$7,748	\$11,477	\$8,989	\$1,241
Naugatuck	\$10,125	\$7,174	\$11,388	\$8,383	\$1,210
East Haven	\$10,082	\$6,159	\$11,270	\$7,291	\$1,131
Manchester	\$10,072	\$5,764	\$11,243	\$6,874	\$1,110
<b>Avg. for Rest of Districts</b>	<b>\$9,844</b>	<b>\$3,638</b>	<b>\$10,266</b>	<b>\$3,949</b>	<b>\$311</b>

1. Foundation (\$9,687) times student need count divided by resident pupil count.  
 2. Aid amount computed using 2008-09 ECS based aid formula divided by resident pupil count.  
 3. Alternative weights equal 1.0 for poverty students and 1.0 for LEP students. Counts of poverty and LEP students used are the same as in 2008-09 base aid formula.  
 All figures reported are computed by the authors using data obtained from appendices to the Connecticut State Department of Education document titled *Education Cost Sharing Grant Program 2008-09* (<http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/merecsgd.pdf>). Appendix data on pages 9-16. Additional data on rates of children qualifying for free or reduced price lunch obtained through the National Center for Education Statistics, Common Core of Data at [www.nces.ed.gov/ced](http://www.nces.ed.gov/ced).

Because the weights used in the student need count have no relationship to the costs of serving poverty and LEP students, the ECS formula does not appropriately target aid to enable districts to provide an adequate education at a reasonable tax rate. The districts most negatively affected by this irrationality in the ECS formula are the city districts.

## No Adjustment for Regional Wage Differences

In addition to differences in student needs, regional differences in teacher wages can influence the cost of securing educational resources and providing educational opportunities. Thus, the prototypical version of a foundation formula described above uses a comparative wage index to adjust each district's foundation spending amount to reflect teacher wage costs. A wage index developed for the National Center for Educational Statistics in 2006 estimates differences in wages for professional occupations across Connecticut's four metropolitan business statistical areas (which approximate labor markets).<sup>48</sup> These estimates indicate that competitive wages in the Bridgeport-Stamford-Norwalk region are approximately 20 percent higher than in the Hartford, New Haven and Norwich-New London areas. The ECS formula, however, does not adjust the foundation amount for regional differences in competitive wages.

Table 1.5 illustrates how adjusting target funding amounts for regional differences in wages would influence the distribution of base formula aid. The second and third columns of Table 1.5 presents the foundation targets and base formula aid amounts under the 2008-09 ECS program for nine different districts. The nine districts include Bridgeport, Hartford and New Haven, three wealthy districts located near those cities (Fairfield, West Hartford, and North Haven), and three more rural districts with varying wealth levels (Griswold, Woodstock, and Litchfield). The fourth and fifth column show the foundation targets and base aid amounts computed for these districts after adjusting the foundation target for regional differences in professional wages, leaving every other element of the base aid formula unchanged.<sup>49</sup> The index used in the present simulation, for illustrative purposes, is the 2005, National Center for Education Statistics Education Comparable Wage Index.<sup>50</sup> The last column shows how much base formula aid would change for each of the districts if the foundation were adjusted for regional costs differences.

Adjusting the foundation target for regional wage differences would serve to drive more aid toward Bridgeport, a low wealth district in the Bridgeport-Norwalk-Stamford area, away

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<sup>48</sup> Because this index is based on comparison of wages in private sector professional occupations it does not reflect choices regarding teacher salaries made by local school districts, but rather differences in local labor markets that are beyond the control of school districts. See <http://nces.ed.gov/edfin/adjustments.asp>.

<sup>49</sup> If the foundation were set higher than the current level of \$9,687 and student need weights were increased as discussed above, the effect of using a regional wage index on aid amounts for districts in the Bridgeport-Norwalk-Stamford area would be even larger, and especially so for districts such as Bridgeport and Norwalk that have relatively high proportions of poverty and LEP students.

<sup>50</sup> <http://nces.ed.gov/edfin/adjustments.asp>. See also: Lori L/ Taylor and M. Glander, *Documentation for the NCES Comparable Wage Index Data File* (EFSC 2006-865). U.S. Department of Education. (Washington, DC: National Center for Education Statistics, 2006). <http://www.nces.ed.gov/edfin/pdf/2006865.pdf>.

from districts, such as Woodstock and Litchfield, located in the rural Northeast and Northwest parts of the state where professional wages are lower. Since professional wages in the Hartford, Waterbury and New Haven areas are near the state average, base aid for districts in these areas of the state would not be affected much by regional wage adjustments.

**Table 1.5 – Effect of Using Regional Wage Adjustment in Base Formula Aid**

Town	Foundation Target, 2008-09 <sup>1</sup>	Base Formula Aid, 2008-09 <sup>2</sup>	Foundation Target Adjusted Using Regional Wage Index <sup>3</sup>	Base Formula Aid Adjusted Using Regional Wage Index <sup>3</sup>	Change in Aid Due to Regional Wage Index
Bridgeport	\$10,574	\$8,900	\$12,475	\$10,499	\$1,599
Hartford	\$10,418	\$9,321	\$10,418	\$9,321	\$0
New Haven	\$10,380	\$8,738	\$10,145	\$8,541	-\$197
Fairfield	\$9,819	\$884	\$11,584	\$1,043	\$159
West Hartford	\$9,913	\$3,715	\$9,913	\$3,715	\$0
North Haven	\$9,811	\$2,798	\$9,590	\$2,735	-\$63
Griswold	\$9,943	\$6,945	\$9,919	\$6,928	-\$17
Woodstock	\$9,876	\$5,588	\$8,145	\$4,609	-\$1,390
Litchfield	\$9,802	\$2,075	\$8,160	\$1,728	-\$347

1. Foundation (\$9,687) times student need count divided by resident pupil count.  
2. Aid amount computed using 2008-09 ECS based aid formula divided by resident pupil count.  
3. The index used to adjust the foundation for regional wages is the 2005, National Center for Education Statistics Education Comparable Wage Index., <http://nces.ed.gov/edfin/adjustments.asp>. Because the national index is based on year 2000 and because the national index is centered around the national average competitive wages in the year 2000, all Connecticut districts would have competitive wage indices well above 1.0. Using this index as is would then significantly increase foundation targets for all districts. Instead, we take the 2005 index and center that index around the median Connecticut district.  
All figures reported are computed by the authors using data obtained from appendices to the Connecticut State Department of Education document titled *Education Cost Sharing Grant Program 2008-09* (<http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/merecsgd.pdf>). Appendix data on pages 9-16. Additional data on rates of children qualifying for free or reduced price lunch obtained through the National Center for Education Statistics, Common Core of Data at [www.nces.ed.gov/ccd](http://www.nces.ed.gov/ccd).

**How district wealth is measured**

In the prototypical foundation formula estimates of students needs are used to adjust the foundation amount that a district needs to provide adequate educational opportunities. This adjusted foundation is then compared to the amount a district can raise in revenues at a reasonable tax rate to determine the district aid award. The number of high need students is only relevant for determining how much a district needs to spend to provide adequate educational opportunities, it is not relevant for measuring the district’s revenue raising capacity.

Student need counts do, however, appear in the measure of wealth used in the ECS formula:

$$\text{Town Wealth} = \frac{\frac{\text{ENGL}}{\text{Student Need Count}} + \frac{\text{ENGL}}{\text{Population}}}{2} \times \text{Income Adjuster}$$

The effect of including student need counts in the wealth measure is to decrease the estimated wealth of districts with relatively high student need counts, which effectively drives more aid toward high need districts. This feature of the ECS formula needlessly obscures the role that extra weights for need students plays in determining district aid amounts. It would improve the transparency of the formula to remove student need counts from the computation of district wealth, and appropriately increase the extra weights those students receive in the student need count and the resulting adjustment to the district foundation amount.

### **1.5 Other Irrationalities of the ECS Program**

The previous sections focused on features of the ECS base aid formula that undermine the achievement of the equity standards that a foundation formula is intended to promote. Because of exceptions regularly adopted by the Connecticut legislatures, however, ECS grants for a large portion of districts are not determined by the ECS base aid formula. If these exceptions addressed the shortcomings of the ECS formula described above, they might be justified by appeal to equity standards. In fact, these exceptions serve to undermine equity goals. In this section, we discuss several features of the ECS program that operate outside the base formula and that cannot be justified by appeal to either adequacy or equality of opportunity standards. As detailed in Table 1.6, these include how minimum expenditure requirements are formulated and the use of minimum aid ratios, hold harmless and stop loss provisions, aid caps, and supplemental aid awards.

**Table 1.6 – Additional features of ECS program not determined by a rational process**

<b>Feature of the ECS Program</b>	<b>Process used:</b>	<b>Alternative Process:</b>
<b>1. How minimum expenditure requirements are formulated</b>	Linked to past levels of spending plus ECS aid increases	Linked to amount needed to provide adequate educational resources or opportunities.
<b>2. Use of minimum aid ratios</b>	Currently set at 0.09 of foundation target, an ad hoc minimum not linked to any standard conceptions of equity.	Set minimum aid ratio to 0, or allow negative aid.
<b>3. Use of hold-harmless, stop-loss and aid cap provisions</b>	Actual ECS awards determined as percentage increase over prior year's award for majority of districts	Allow base aid formula designed to achieve equal opportunity or adequacy standard determine ECS aid awards.
<b>4. Use of supplemental aid programs</b>	Poverty and density supplements used to drive additional aid to high need districts (prior to 2007-08)	Address the inadequate weights in the ECS student need count directly by basing those weights on estimates of the cost of providing educational opportunities to need students.

**How minimum expenditure requirements are formulated**

As explained above, even a well-formulated foundation aid program will only achieve an adequacy standard if local districts are required to raise local revenues equal to the expected local contribution used to determine the state aid award. The ECS program does in fact include a minimum expenditure requirement. When the ECS program was first established, the requirement was to be set to equal the district foundation amount times the student need count after a three year phase-in. However, in FY 1992-93 the minimum expenditure requirement was divorced from the foundation spending level, and was instead tied to prior year spending plus any increase in ECS aid.<sup>51</sup> This change may have been motivated by the fact that ECS awards were often not tied to foundation spending levels as a result of hold harmless, stop-loss and cap provisions. The minimum expenditure requirement has been modified several times since 1992-93,<sup>52</sup> but remains divorced from the amount the district needs to spend to provide adequate educational resources or opportunities.

As discussed above, under the current ECS base aid formula, the foundation level is set below what virtually all districts in the state actually spend. Because the expected local contribution in the ECS formula is determined as a share (or percentage) of the foundation level,

<sup>51</sup> Lohman, "ECS Formula Changes Since 1988."

<sup>52</sup> Ibid.

a low foundation level implies a low expected local contribution. As a result, the current and historical levels of revenues from non-state sources are typically higher than the expected local contribution used in the ECS formula. This point is illustrated in Table 1.7, which presents the foundation targets, expected local contributions, actual spending and ECS awards, and the revenues raised from sources other than the ECS program for nine different districts. For each of these districts, actual revenues from non-ECS sources in 2007-08 (last column of Table 1.7) far exceeds the expected local contributions used in the 2008-09 ECS base aid formula (third column of Table 1.7).

**Table 1.7 – Expected and Actual Per Pupil Local Contributions for Selected Districts**

Town	Foundation Target, 2008-09 <sup>1</sup>	Expected Local Contribution, 2008-09 <sup>2</sup>	Current Expenditures/Pupil 2007-08	ECS Award, 2007-08	Revenue from non-ECS sources, 2007-08
Bridgeport	\$10,574	\$1,694	\$12,012	\$7,207	\$4,805
Hartford	\$10,418	\$1,097	\$15,706	\$8,059	\$7,648
New Haven	\$10,380	\$1,642	\$16,036	\$7,360	\$8,675
Fairfield	\$9,819	\$8,935	\$13,898	\$352	\$13,546
West Hartford	\$9,913	\$6,199	\$11,952	\$1,540	\$10,412
North Haven	\$9,811	\$7,013	\$10,589	\$683	\$9,906
Griswold	\$9,943	\$2,998	\$10,697	\$5,332	\$5,365
Woodstock	\$9,876	\$4,288	\$10,307	\$3,633	\$6,673
Litchfield	\$9,802	\$7,727	\$12,836	\$1,136	\$11,700

1. Foundation (\$9,687) times student need count divided by resident pupil count.  
2. Expected local contribution computed using 2008-09 ECS base aid formula divided by resident pupil count.  
All figures reported are computed by the authors using data obtained from appendices to the Connecticut State Department of Education document titled *Education Cost Sharing Grant Program 2008-09* (<http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/mercegsd.pdf>). Appendix data on pages 9-16. Additional data on rates of children qualifying for free or reduced price lunch obtained through the National Center for Education Statistics, Common Core of Data at [www.nces.ed.gov/ccd](http://www.nces.ed.gov/ccd).

Because revenues from non-ECS sources exceed the expected local contribution assumed in the current ECS formula, a requirement that all districts raise enough local revenue to reach their foundation target would be non-binding, i.e. it would have no effect on decisions about how much local revenue to devote to education. However, if the foundation amount and/or the weights for poverty or LEP students in the student need count were raised, as discussed above, then many districts might in fact raise less than the local fair share needed to reach the foundation target. In this case, tying minimum expenditure requirements to historic levels of spending would not necessarily be sufficient to ensure adequate educational resources or opportunities in all districts.

Minimum expenditure requirements are currently tied to historical spending levels in specific districts rather than to the amounts required to provide adequate educational resources or

opportunities. As a result, the ECS formula does not ensure that any adequacy standard is obtained.

### **Minimum aid ratios**

The rationale for a foundation aid program is to provide districts the ability to provide an adequate education at a reasonable level of local taxation. Following this logic, districts that are wealthy enough to completely fund an adequate education with a reasonable local tax effort would not receive any foundation aid. In fact, as discussed above, to achieve a goal of equal educational opportunities, a foundation aid program would need to require any district that can raise more than its adjusted foundation amount at the state specified tax rate to pay local revenues in excess of the adjusted foundation to the state for purposes of redistribution to high need and/or low wealth districts. That is the program would allow for negative aid amounts.

Far from allowing negative aid amounts, the current version of the ECS program does not allow any district to receive an ECS award less than 9 percent of the foundation times their student need count. In 2008-09, this minimum aid ratio effectively increased the ECS base formula award for the 41 wealthiest districts in the state by a total of \$87.4 million.<sup>53</sup> Those districts whose base formula aid would be zero or negative in the absence of minimum aid ratios, but which have base formula aid amounts greater than \$1 million in 2008-09 are listed in Table 1.8.

Because the budgetary expenditures required to fully fund ECS base formula aid are more than the legislature has been willing to appropriate, the ECS awards have had to be reduced below ECS base formula aid for low wealth and high need districts. Thus, it is fair to say that the legislature has funded aid to wealthy districts in excess of what those districts need to provide an adequate education at a reasonable tax rate by reducing aid to low-wealth districts below what they need to provide adequate education at reasonable tax rates. Thus, the minimum aid ratio undermines the ability of the ECS program to achieve both adequacy and equal opportunity standards.

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<sup>53</sup> This calculation assumes that in the absence of the minimum aid ratio that districts that would have negative base aid ratios would receive zero ECS aid. If these districts were assessed negative aid awards the savings in state expenditures would be even larger.



**Table 1.8 – Districts Benefiting from Minimum Aid Ratios**

<i>Town Name</i>	<i>Equalized Net Grand List Per Pupil</i>	<i>Base Formula Aid, 2008-09</i>
<b>Greenwich</b>	\$ 5,181,953	\$7,994,481
<b>New Canaan</b>	\$ 2,727,999	\$3,638,827
<b>Westport</b>	\$ 2,501,177	\$5,012,508
<b>Darien</b>	\$ 2,361,359	\$4,090,339
<b>Stamford</b>	\$2,186,339	\$13,489,852
<b>Old Saybrook</b>	\$1,919,993	\$1,447,203
<b>Old Lyme</b>	\$1,792,600	\$1,093,236
<b>Fairfield</b>	\$1,659,440	\$8,636,217
<b>Wilton</b>	\$1,588,842	\$3,852,573
<b>Weston</b>	\$1,492,498	\$2,263,192
<b>Redding</b>	\$1,509,582	\$1,588,445
<b>Easton</b>	\$1,411,306	\$1,409,979
<b>Ridgefield</b>	\$1,408,428	\$4,892,893
<b>Orange</b>	\$1,211,904	\$ 2,238,851
<b>Brookfield</b>	\$1,195,739	\$ 2,629,082
<b>Guilford</b>	\$1,188,872	\$ 3,405,542
<b>Madison</b>	\$1,139,031	\$3,412,962
<b>Woodbridge</b>	\$1,106,057	\$1,434,139
<b>Avon</b>	\$984,786	\$3,148,291
Source: All figures reported are computed by the authors using data obtained from appendices to the Connecticut State Department of Education document titled <i>Education Cost Sharing Grant Program 2008-09</i> ( <a href="http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/merecsgd.pdf">http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/merecsgd.pdf</a> ). Appendix data on pages 9-16.		

**Hold harmless, stop-loss and cap provisions**

Unless the state is willing to dramatically increase total expenditures on a state aid program, whenever a new aid formula is adopted, some districts will see reductions in the formula determined aid amounts and others will see increases. After all, the point of adopting a new formula is to achieve greater equity by changing the distribution of state aid across districts. The Connecticut legislature, however, has been reluctant to allow any district to see decreases in the amount of ECS aid that it receives. To avoid or minimize decreases in state aid to particular districts, the legislature has annually adopted hold-harmless or stop-loss provisions.<sup>54</sup> Although the precise formulation of these provisions have varied since the ECS program was first established, hold-harmless provisions typically have taken the form of a minimum ECS

<sup>54</sup> Loman, “ECS Formual Changes Since 1988.”

entitlement set equal to some percentage increase above the previous year's entitlement. Stop-loss provisions limit reductions in total ECS aid amounts to some percentage of the previous year's award.

Of course, hold-harmless and stop-loss provisions increase the amount of state budgetary expenditures required to fund the ECS program relative to a program in which the ECS base aid formula determined award amounts. In most years, the legislature has not been willing to fully fund aid awards equal to those determined by the ECS base aid formula. As a result each year since FY 1992-93, the ECS awards have been capped at some percentage increase of the district's ECS award the previous year, regardless of formula entitlement. Thus, reductions in awards below the ECS base formula aid amount for some districts (achieved by the caps) have been used to fund awards in excess of the ECS base formula aid for other districts (required by the hold-harmless provisions). Analyses posted on the Connecticut Coalition for Justice in Education Finance website indicates that for each year between FYs 1995-96 and 2006-07, no less than 84 percent of districts were affected by either hold-harmless/stop-loss provisions or caps, and thus were essentially off formula.<sup>55</sup> In FYs 2005-06 and 2006-07, the state completely abandoned the ECS formula and simply increased each district's aid award by 2 percent above the previous year.

The combination of caps and hold-harmless/stop-loss provisions undermines the achievement of equity goals in two ways. First, when aid awards are capped regardless of the formula entitlement, some districts receive less than the difference between the amount of funding required to provide an adequate education and what they can raise at what the state deems a reasonable tax effort. Thus, caps undermine the achievement of an adequacy standard. Second, continual use of caps and hold-harmless provisions ties the amount a funding a district receives to conditions that pertained several years earlier. As a result, districts with wealth levels that are declining relative to the rest of the state and districts with growing proportions of high need students receive less in aid than they need to provide an adequate education at reasonable local tax rates.

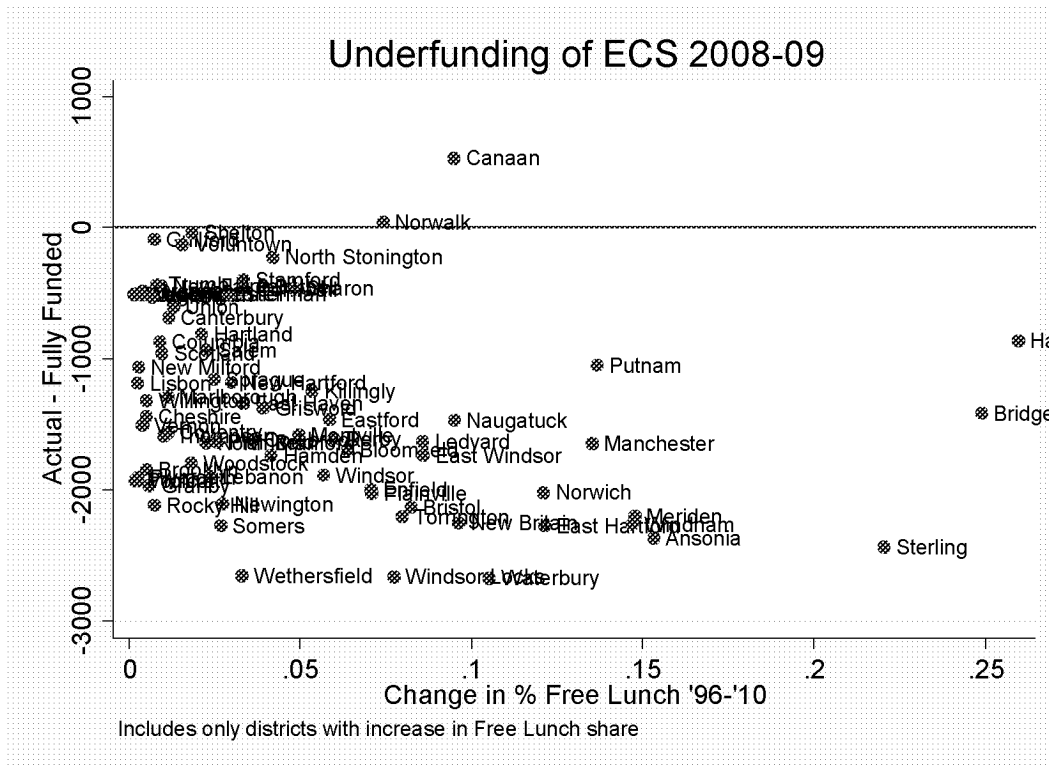
Changes to the ECS programs that were initiated in FY 2007-08 did not put an end to hold-harmless provisions. For FY 2008-09, a guaranteed minimum entitlement of at least a 4.4 percent increase over the previous year's entitlement was enacted.<sup>56</sup> The FY 2008-09 ECS aid amount for all but 4 districts were determined by this minimum entitlement amount rather than the ECS base aid formula. Funding this minimum entitlement with the appropriations the legislature is willing to devote to the ECS program requires slowing the phase-in to the current ECS base aid formula described above.

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<sup>55</sup> See [http://ccjef.org/documents/new-pdfs/CCJEF\\_ECS\\_CAP\\_and\\_Stoploss\\_Totals\\_10.08.pdf](http://ccjef.org/documents/new-pdfs/CCJEF_ECS_CAP_and_Stoploss_Totals_10.08.pdf)

<sup>56</sup> Connecticut State Department of Education Division of Finance and Internal Operations, "Education Cost Sharing (ECS) Grant Program, 2008-09," dated January 2009.

**Figure 1.3 – Effects of Underfunding ECS on District Aid Amounts, 2008-09**



Data Source: All figures reported are computed by the authors using data obtained from appendices to the Connecticut State Department of Education document titled *Education Cost Sharing Grant Program 2008-09* (<http://www.sde.ct.gov/lib/sde/PDF/dgm/report1/mercesgd.pdf>). Appendix data on pages 9-16. Calculation of “underfunding” based on per pupil difference between town by phase-in (actual) town “entitlements” (seen on page 15 & 16) and each districts’ “fully funded grant” amount. Above amounts are reported per resident pupil.

Figure 1.3 demonstrates that by tying ECS aid amounts to the past, hold-harmless provisions treat districts with changing student characteristics unfairly. The figure plots the differences between each district’s fully funded 2008-09 ECS entitlement and the actual ECS entitlement against changes in the percent of students in the district who are eligible for free-lunch between 1996 and 2010. The differences between the fully funded and actual entitlement is the result of hold harmless and phase-in provisions. Districts including Waterbury, East Hartford, Norwich, Windham, Meriden, Ansonia, and Sterling saw increases in the percent free-lunch of more than 10 percentage points between 1996 and 2007, and lost more than \$2,000 per pupil in ECS aid because of deviations from the ECS base aid formula.

**Supplements**

The ECS program has typically included supplements to the basic ECS aid including supplemental aid based on concentrations of poor students; density supplements targeted to towns with above average population density which tend to have a higher demand for other

municipal services; and bonuses for regional schools equal to \$100 dollar per enrolled student for a K-12 region or a proportionate share of that amount for regions with fewer grades (Loman, 2004b). The poverty and density supplements tend to drive additional aid to high need districts and thus, might help to compensate for shortcomings of the ECS formula due to inadequate weights for poverty students. These supplements, however, have been a small part of the ECS program and subject to annual appropriations of the legislature. These programs were eliminated beginning in FY 2007-08, and only the regional bonuses remain. It is preferable to address the inadequate weights in the ECS student need count directly by basing those weights on estimates of the cost of providing educational opportunities to low-income students.

## **1.6 Changes to the ECS Program Since Its Inception**

The ECS program has undergone changes virtually every year since it was first established.<sup>57</sup> There is no evidence that these changes have been the result of rational processes designed to more closely link the ECS program to well-defined conceptions of equity. The most pervasive changes to the ECS program since it was first established have been to limit the growth in the foundation amount and to introduce and to renew minimum aid ratios, hold-harmless, and aid caps. These changes seem primarily motivated by the desire to limit state expenditures on the ECS program and the amount of redistribution of aid away from wealthy districts, and are not justified by any appeal to established standards of equity.

Limiting growth in the foundation has had the effect of divorcing the foundation amount from typical per pupil spending levels in Connecticut, and thus, from any reasonable estimate of what it takes to provide an adequate education. As a result, the ECS formula has not been designed to allow districts to provide adequate educational resources or opportunities at local tax rates deemed reasonable by the state, the well-established purpose of a foundation formula. These decisions to limit the foundation are not supported by any analysis of the cost of achieving student outcomes.

The decisions to introduce and renew minimum aid ratios, hold-harmless provisions, and aid caps divorce the ECS program from any foundation formula and thus, from any standard of adequacy or equal opportunities. Instead, ECS aid awards are continually linked to past aid levels, which serves to freeze in place inequities in the aid system and to hurt districts with growing levels of student needs.

The most significant changes to the ECS program in over a decade were adopted before the 2007-08 fiscal year. However, there is little evidence that these changes are the result of rational processes designed to promote equity. Perhaps the biggest change adopted was the first

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<sup>57</sup> See Loman, "ECS Formula Changes Since 1988" and State Department of Education, "ECS Formula Changes Since 2006." <http://www.cga.ct.gov/ps99/rpt/olr/htm/99-r-1233.htm>

significant increase in the foundation amount since the mid-1990s. Nonetheless, the foundation amount currently remains below the amount spent in virtually every district in the state, and is not supported by any documented study of the cost of providing education. The extra weights used for poverty students were increased from 0.25 to 0.33 and for LEP students from 0.10 to 0.15. However, these rates remain far below the best available estimates of the extra costs of providing poverty and low-income students equal opportunities to achieve student outcomes. Finally, changes to these aspects of the ECS base aid formula are subject to a phase-in of an indefinite length of time. In the meantime, deviations from the base aid formula continue to be used in order to ensure that all districts receive aid increases, which serves to slow the rate at which the new ECS formula is phased-in.

There is no evidence that key elements of the ECS formula have been developed through a rational processes designed to achieve well-defined equity standards. The state has not clearly defined adequate student outcomes nor commissioned studies to estimate the costs of services required to achieve those outcomes or to estimate the additional costs required to provide need students equal educational opportunities. Changes to the ECS formula over time have been undertaken with the primary objective of limiting state government expenditures on the ECS program with little documented attention to the required costs of providing education. Even the recent changes to the ECS program have not been based on efforts to define equity standards or to examine the costs of providing adequate educational opportunities. The result is an ECS program that is divorced from established and constitutionally required standards of equity and, as we will show in the ensuing sections, a school finance system that tends to underfund schools in high poverty districts.

## **2.0 The Education Cost Sharing Formula Fails to Provide Equal and Adequate Educational Opportunity**

In the previous section, we identified features of the ECS program that are not sufficiently linked to any well-defined conception of school finance equity. In this section, we examine the distribution of school funding across districts and evaluate the extent to which equal and adequate educational opportunities are provided across school districts and children. We find that high poverty districts are consistently underfunded relative to both equal opportunity and adequate opportunity standards.

To assess district funding relative to an equal opportunity standard we calculate cost adjusted spending levels of each district in the state. We then compare cost adjusted spending in each district to the statewide average, and call that difference the district's equal educational opportunity (EEO) gap. When the EEO gap is negative we refer to it as an EEO deficit. We also compare spending in each district to the amount required to provide adequate educational opportunities estimated in a study conducted by Augenblick and Associates. We refer to this difference as the district's adequacy gap. Our key findings are as follows.

1. The ECS base formula as modified in 2008-09 provides insufficient support to districts serving high need student populations. While ECS provides roughly 10% higher aid awards for the highest need districts than for the lowest need districts, estimates of the costs of providing educational opportunities suggest that the highest need districts require 50% to 100% more funding than the lowest need districts to provide equal educational opportunities.
2. Equal educational opportunity (EEO) deficits, that is the difference between cost-adjusted spending in the district and the average level of cost-adjusted spending, is greater than \$2,000 per pupil in several districts serving high need student populations. A handful of high need districts have particularly severe EEO funding deficits of greater than \$3,000 per pupil.
3. Districts with large EEO deficits also have student outcome measures substantially below those of the average district. EEO gaps are strongly associated with variations in student outcomes.
4. Districts with the largest EEO gaps also have the largest adequacy gaps.
  - a. The statistical relationship between EEO gaps and adequacy gaps, i.e. the difference between district spending and the spending required to provide adequate educational opportunity as estimated by Augenblick and Associates, is very strong.

- b. Districts with larger adequacy funding gaps also have lower measured outcomes and that relationship is also strong.

We begin by explaining our methods for assessing the distribution of school funding across districts. Equal educational opportunities (EEO) are provided when the financial resources available to districts are sufficient for children with varied educational needs, served in varied educational settings, to have reasonable expectations of achieving common outcome goals. In order to evaluate equal educational opportunity, we must use some method to adjust nominal spending across school districts for the differences in costs of achieving common outcome goals. The first part of this section describes how we adjust nominal spending amounts to obtain measures of educational opportunities.

Next, we examine the distribution of cost and need adjusted school funding across Connecticut school districts. Specifically we compute the difference between the cost and need adjusted funding in each district and the statewide average, and refer to this difference as the district's equal educational opportunity (EEO) gap. We find that high poverty districts have the largest EEO gaps.

The final part of this section examines the extent to which Connecticut school children are provided reasonable expectations of achieving adequate educational outcomes. One challenge in conducting such an assessment is that the state has never produced a clear, rationally derived benchmark for what constitutes an adequate education. In lieu of a state established benchmark, we use the only available estimates of the cost of an adequate education produced for Connecticut, those from a 2005 study conducted by John Augenblick and colleagues. We first assess this study and confirm that it applied a standard set of methods used in many other states to derive the cost of an adequate education and that the cost estimates produced by the study are similar to what have been produced in other states. Then applying these estimates of the costs of providing an adequate education we demonstrate that the school finance system in Connecticut fails to guarantee adequate funding for large shares of Connecticut school children.

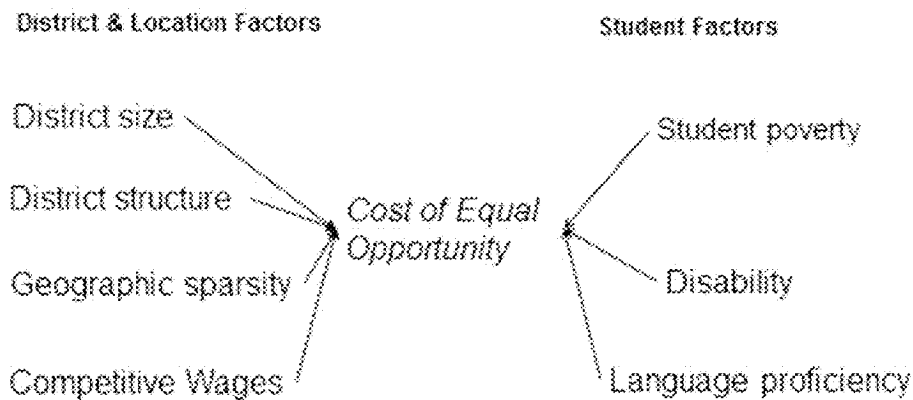
## **2.1 Application of Cost and Need Adjustments to Connecticut School Districts**

William Duncombe and John Yinger, in the *Handbook of Research on Education Finance and Policy* provide an overview of factors generally considered to influence the costs of providing equal educational opportunity. They note: "We find a broad consensus among scholars that the cost of achieving any given level of student performance is higher in some districts than in others because of 1) differences in the compensation needed to attract school personnel, 2)

differences in enrollment size, and 3) differences in the concentration of disadvantaged students or those with special educational needs.”<sup>58</sup>

Figure 2.1 lays out the common factors considered to influence the costs of educational opportunity and outcomes. Those measures can be organized by district location and structural factors and by student related factors. Location factors can influence the price districts pay for key inputs including teacher wages and utility charges, both of which vary significantly across the state. Population sparsity also affects operating costs for transportation and may constrain districts’ ability to share staff across schools. District size and grade range also typically influence the organization of staffing and programs in ways that affect costs.

**Figure 2.1 - Factors Influencing the Costs of Providing Educational Opportunities**



Student related cost factors can be organized into at least two groups. First, there are individual educational needs, such as a child having a specific learning disability or more severe disability, or a child with limited English language proficiency. Such children typically require additional services including access to additional, specialized school personnel, which increases costs for those children. In addition, the collective characteristics of the student population may require reorganization of instruction in order to achieve comparable educational outcomes. Children attending school in higher poverty settings may require smaller class sizes and/or more highly skilled teachers to achieve outcomes comparable to children in lower poverty settings.

<sup>58</sup> William D. Duncombe and John M. Yinger. “Measurement of Cost Differentials,” in *Handbook of Research in Education Finance and Policy*, eds. Helen F. Ladd and Edward E. Fiske (New York: Routledge, 2008): 250.



Further, student population characteristics may interact with input prices. It is increasingly well understood that all else equal, teachers with specific qualifications will tend to avoid teaching in high poverty and high minority concentration settings.<sup>59</sup> Wage premiums may be required to offset these labor market dynamics.

In this section, we develop a series of cost adjustments based on existing research literature, using an approach similar to that used by Bifulco in a national peer reviewed study of Black-White funding disparities.<sup>60</sup> Specifically, we develop adjustments for differences in regional wages and student needs across districts. We set aside issues related to district size, geographic sparsity, and grade configuration. As a result, in our subsequent evaluations of EEO disparities, we include only unified districts with more than 2,000 students. We exclude districts serving fewer than 2,000 students, or those most likely to face significant economies of scale related costs.<sup>61</sup> There are three reasons for setting aside these adjustments and instead excluding districts. First, there exists no well documented available cost index for adjusting for the combination of economies of scale and sparsity. Second, these adjustments are complicated in Connecticut by their intersection with varied grade range configurations between unified and non-unified districts. Third, unified school districts enrolling over 2,000 students enroll about 88% of all publicly schooled children in Connecticut, so the the districts used in our analysis represent the vast majority of students.

The work of William Duncombe and John Yinger, in their article *How Much More Does a Disadvantaged Student Cost?*<sup>62</sup> provides the most direct estimates of the additional costs of achieving common outcomes for children in poverty - using alternative poverty measures - and children with limited English language proficiency. This article has provided the basis for other published research evaluating the relative costs of serving children with varied needs and research estimating funding gaps.<sup>63</sup> Existing research suggests that weights to adjust for cost differences vary across states and settings. Differences in weights from different settings appear to be a function of differences in the regional distributions of families in poverty, with weight estimates for children in poverty (qualifying for subsidized lunch) at around 70 to 80% in plains

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<sup>59</sup> Eric A. Hanushek, John Kain, and Steven Rivkin, "Why Public Schools Lose Teachers," *Journal of Human Resources* 34, no. 2 (March 2004): 326-354.

<sup>60</sup> Bifulco, "District-Level Black-White Funding Disparities in the United States."

<sup>61</sup> Matthew Andrews, William D. Duncombe, and John M., Yinger, "Revisiting economies of size in American education: Are we any closer to consensus?" *Economics of Education Review*, 21, no. 3 (June, 2002): 245-262.

<sup>62</sup> Duncome, W.D., Yinger, J. (2005) *How Much More Does a Disadvantaged Student Cost?*  
<http://surface.syr.edu/viewcontent.cgi?article=1102&context=cpr>

<sup>63</sup> Bifulco, "District-Level Black-White Funding Disparities in the United States."

states and closer to 100% in New York.<sup>64</sup> As such, estimates from neighboring states or those in the same region are more likely to approximate relevant weights for Connecticut.

Because there is some uncertainty in the research community concerning the “best weights” to adjust for costs associated with student needs, we tested a range of weights.<sup>65</sup> The three alternative student need adjustments we applied are:

**Option 1: 150% (2.5x) Census poverty and 100% (2x) ELL**

**Option 2: 100% (2x) Subsidized Lunch and 100% (2x) ELL**

**Option 3: 50% (1.5x) Subsidized Lunch and 60% (1.6x) ELL**

Option 1 uses child poverty rates drawn from the U.S. Census’ Small Area Income and Poverty Estimates and assumes that the additional costs associated with students from families falling below the federal poverty threshold are 150% of average costs, a rounded estimate drawn from Duncombe and Yinger.<sup>66</sup> Our second option uses percentages of children qualifying for free or reduced price lunch and applies a 100% additional cost weight, also drawn from Duncombe and Yinger. Based on the work of Duncombe and Yinger,<sup>67</sup> cost adjustments based on Option 2 should approximate cost adjustments based on Option 1. Option 3 cuts the subsidized lunch weight in half (approximating low range weights from a recent review of professional judgment studies<sup>68</sup>) and reduces the ELL weighting to .60 from 1.0. The higher weights approximate more closely estimates from peer reviewed empirical research. The lower weights are closer to estimates from several professional judgment studies or input-oriented studies of education costs, most of which have not been peer reviewed.<sup>69</sup>

The majority of analyses that follow focus on the middle alternative because preliminary analyses indicated inconsistencies in Census Poverty estimates for Connecticut districts over

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<sup>64</sup> Bruce D. Baker, Lori L. Taylor, and Arnold. Vedlitz, “Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction.” (Washington, DC: *National Research Council*, 2008).

<sup>65</sup> Ibid.

<sup>66</sup> Duncombe and Yinger, “How Much more Does a Disadvantaged Student Cost?”

<sup>67</sup> Duncombe and Yinger, “How Much more Does a Disadvantaged Student Cost?”

<sup>68</sup> Baker, Taylor, and Vedlitz, “Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction.”

<sup>69</sup> For reviews of professional judgment studies see Baker, Taylor, and Vedlitz, “Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction;” Baker, “The Emerging Shape of Educational Adequacy;” and Bruce D. Baker, “Evaluating the Reliability, Validity and Usefulness of Education Cost Studies,” *Journal of Education Finance* 32, no. 2 (Fall 2006): 170-201.

time.<sup>70</sup> Note that we do not include additional weights for children with disabilities because we do not have access to consistent counts of such students by severity of classification over time for all Connecticut school districts.<sup>71</sup> It is reasonable to assume that these children also vary in concentrations across districts and should be considered in this adjustment scheme. Specifically, it is likely that higher poverty districts have higher concentrations of children with disabilities.<sup>72</sup> We construct our overall cost adjustments by first calculating a weighted pupil count and then converting that weighted pupil count into a pupil need index:

- 1) Weighted Pupils = Pupils + (Poverty Weight x Poverty Count) + (ELL Weight x ELL Count)
- 2) District Weight Ratio = Weighted Pupils / Pupils
- 3) Student Need Index = District Weight Ratio / Average District Weight Ratio

To create our overall cost index we take our student need index and multiply it times the National Center for Education Statistics Education Comparable Wage Index (ECWI) for each district (centered around the statewide average ECWI for Connecticut).<sup>73</sup>

#### **District EEO Index = Student Need Index x ECWI**

We can compare these weights to the implied weight within the current ECS formula. We calculate an implied weight for ECS based on the assumption that ECS 2008-09 base formula aid was fully funded.

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<sup>70</sup> For example, when comparing Census Small Area Income and Poverty estimates from the earliest years available (<http://www.census.gov/did/www/saipc/data/schools/data/index.html>) to later years (post-2000) there is a substantial reduction in poverty rates for some large districts (dropping from between 40% to 60% poverty to invariably below 40%). No other evidence was available to corroborate such a substantial decline in urban poverty in Connecticut during that period. Further, because Census poverty data are estimated based on location of family residence, Census poverty rates may not accurately represent enrolled students in districts that send and receive students from other districts or schools.

<sup>71</sup> Specifically, we have CTDOE reports of special education counts by disability classification for 2007-08 through 2009-10, an overlap of only 1 year with our financial data. We do have earlier data on total counts of children with IEPs from the National Center for Education Statistics Common Core of Data, but by our experience, these data (on special education counts) tend to be inconsistent with other sources and have gaps for many districts in many years.

<sup>72</sup> Baker and Ramsey, "What we don't know can't hurt us?" Using the 2007-08 data to evaluate correlations with poverty, we find a positive, statistically significant (0.5271) correlation between rates of children qualified for free or reduced price lunch and children classified as having disabilities in general, indicating that by excluding this factor we may be underestimating overall student needs in higher poverty districts, especially if we apply our lower poverty adjustment.

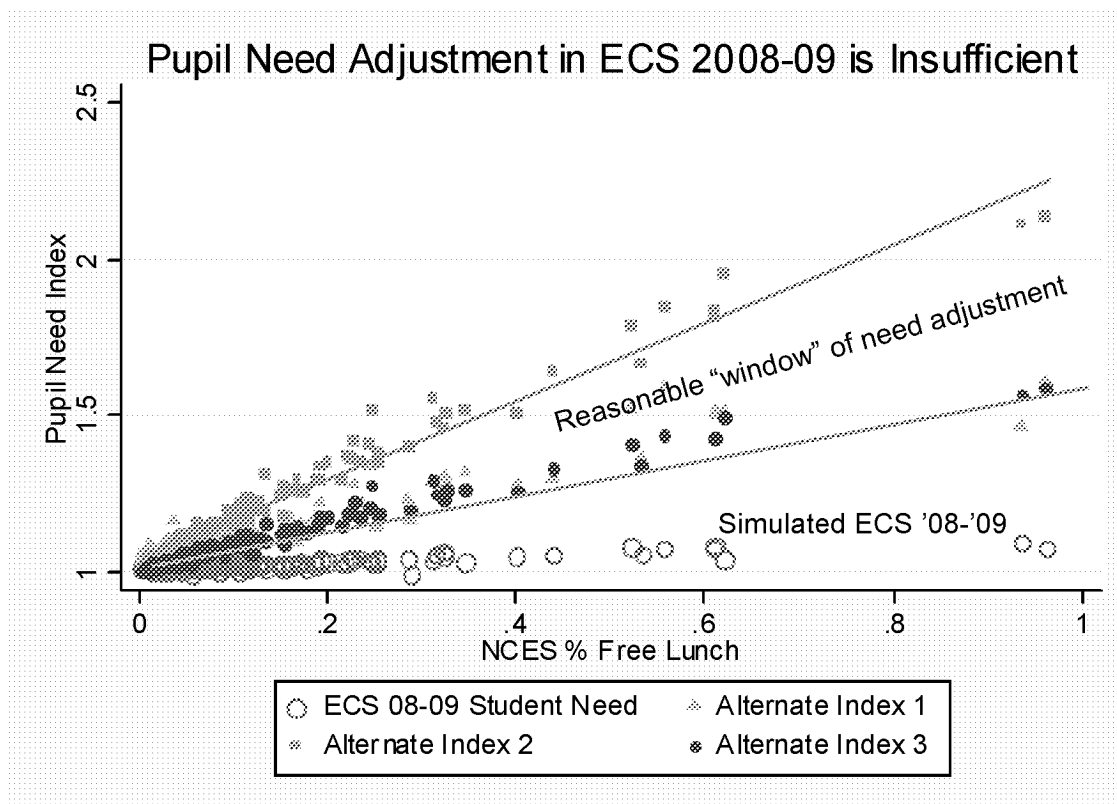
<sup>73</sup> Taylor and Fowler, *A Comparable Wage Approach to Geographic Cost Adjustment*, p. v.

**ECS Implied Weight = Projected ECS '08-'09 Full Funding/Base (Minimum) ECS '08-'09 Funding**

That is, each district's need adjusted target funding level within ECS is divided by the statewide minimum need adjusted target funding level within ECS. Figure 2.2 below compares the weighting schemes we estimate above to the implied weight of the fully funded ECS base aid formula in 2008-09. In Figure 2.2, the vertical axis shows the "need index" for each district, either calculated for our cost indices or implied by ECS. A need index of 1.0 would indicate a district with no additional student needs, or the minimum needs (where the hypothetical condition of "no additional" needs and the actual conditions of the lowest need district are approximately the same). For the highest poverty districts in the state, the ECS formula provides only a few percentage point increases in need adjustment. Specifically, Figure 2.2 shows that under ECS full funding, the district with 100% low income children is expected to receive about 8% (8.074%) more foundation target funding per pupil than a district with 0% low income children. That is, the implicit need weighting of the ECS formula is less than 10%.

By comparison, our alternative indices suggest that the highest need districts in fact require between 50% and 100% more in per pupil funding than the lowest need districts.

**Figure 2.2 – Pupil Need Adjustment in ECS 2008-09 Compared to Need Adjustments Supported by Research**



## 2.2 The distribution of funding across Connecticut school districts relative to an equal educational opportunity standard

To evaluate the distribution of equal educational opportunity across Connecticut school districts, we first calculate each district's "Equal Educational Opportunity Adjusted Expenditures" as follows:

$$\text{EEO Adjusted Spending} = \text{NCEP} / \text{District EEO Index}$$

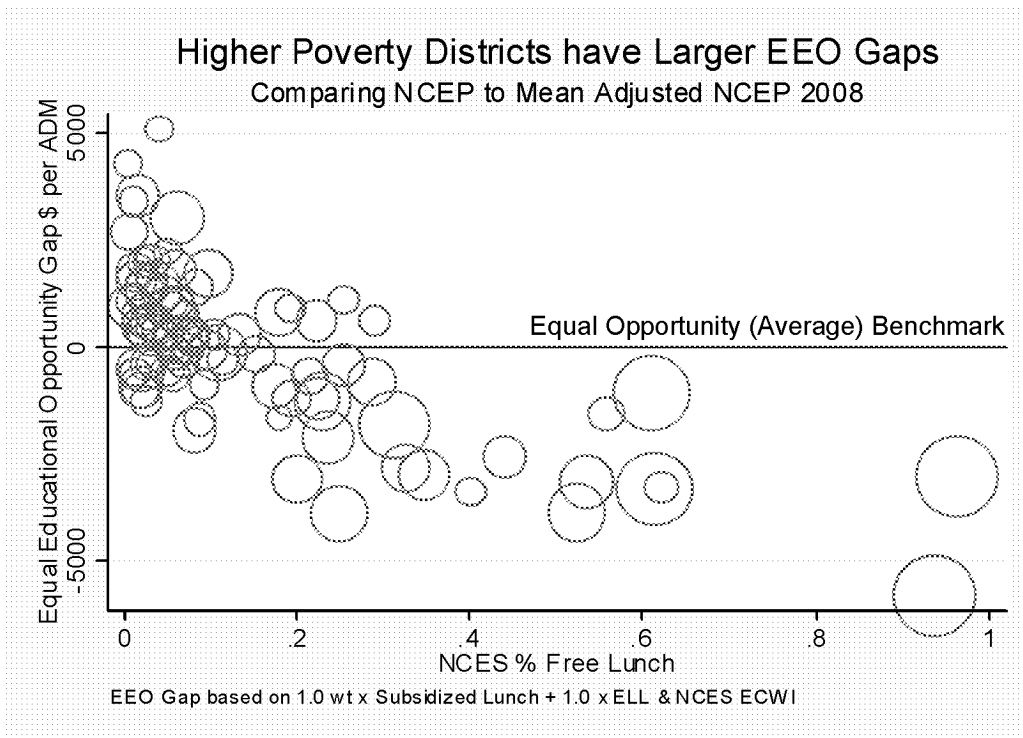
Each district's EEO adjusted spending represents the value of that district's NCEP toward achieving common outcome goals.

Next, we calculate the difference between the average district's EEO adjusted NCEP and each district's EEO adjusted NCEP, producing an EEO gap measure. Districts with a negative EEO gap have lower EEO adjusted revenues than the average district, indicating that they have less funding than needed to achieve outcomes comparable to the average district. We say that these districts have EEO deficits. Districts with higher EEO adjusted spending than the average district are districts that spend more than would be needed to achieve outcomes comparable to the average district. These districts have EEO surpluses.

Figure 2.3 plots the EEO gaps against district rates of children qualifying for free or reduced price lunch, using data from 2007-08. Specifically, Figure 2.3 uses the Option 2 weighting scheme, where EEO adjustment is based on a 1.0 additional weight on children qualified for free or reduced price lunch. The graph includes only districts that are unified K-12 districts enrolling over 2,000 pupils. The size of circles in the figure indicates the enrollment size of districts. The figure demonstrates that districts with relatively large shares of low income children fall below the equal opportunity benchmark, whereas districts with relatively small shares of low income children tend to fall above the EEO benchmark. In addition, there is variation in the levels of opportunities – here, in the size of the gaps – among districts with equally high shares of low income students.

Figure 2.4 simply attaches name labels to the districts in Figure 2.3. New Haven and Windham have higher levels of funding than districts with similar shares of low-income students including Meriden, New Britain, New London and Waterbury. Similarly, Hartford has higher levels of funding than Bridgeport despite that fact that both districts have nearly 100 percent of students eligible for free-lunch. Even the relatively better funded districts of New Haven, Windham, and Hartford, however, fall below the level of EEO adjusted NCEP available in the average district.

**Figure 2.3 – EEO Gaps By Percent Free-Lunch Eligible and Size**



**Figure 2.4 – EEO Gap by Free-Lunch Eligible, with District Names**

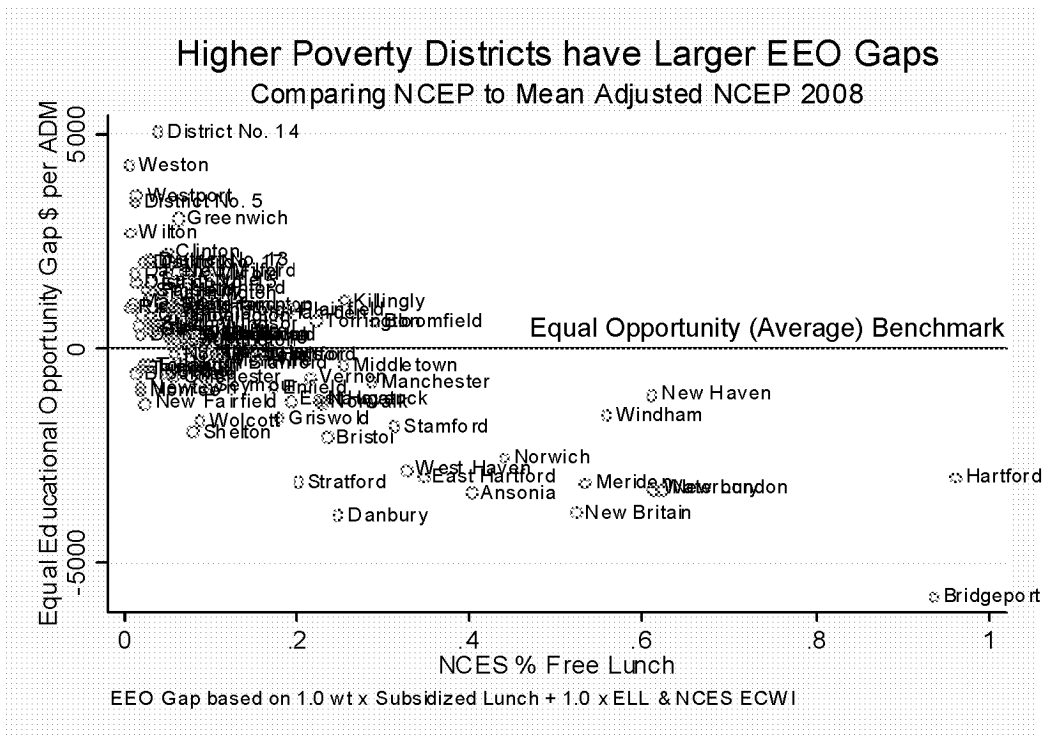
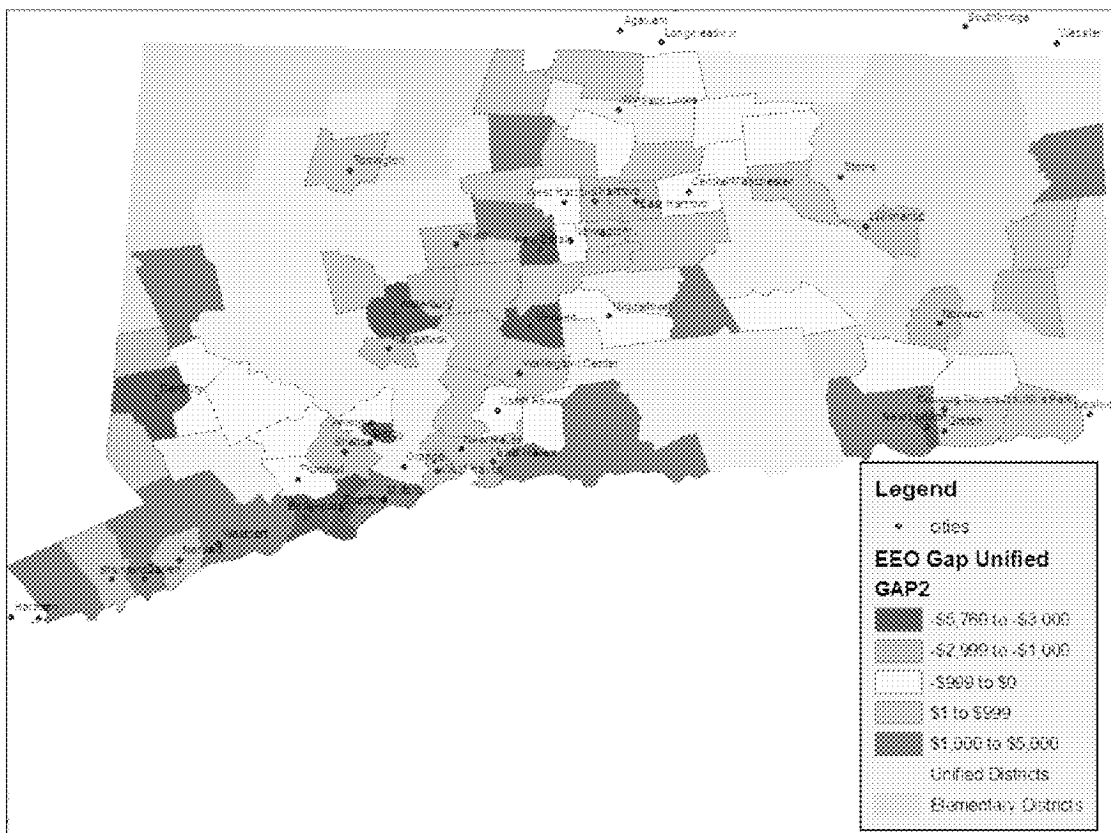


Figure 2.5 maps the EEO gaps presented in the previous figure, in an attempt to explore geographic contiguity of funding gaps. Areas in yellow are those with modest EEO funding gaps, and in pale blue with modest EEO surpluses. Areas in dark blue have significant EEO surpluses. Areas in orange and red have large to very large EEO gaps. Areas in the deepest shade of red include Danbury, Bridgeport, Stratford, Ansonia, Waterbury, New London, Meriden and New Britain. Hartford and New Haven are in Orange. Areas with either surpluses or small deficits are scattered throughout the state.

**Figure 2.5 - Distribution of EEO Funding Gaps 2007-08  
(K-12 Districts Enrolling over 2,000 Students)**



The following two tables attempt to disaggregate the disparities in revenues among high poverty districts. These tables help explain why districts like Bridgeport, Waterbury, Meriden and New Britain and New London have larger EEO gaps than other districts with similar levels of poverty. Particularly, they help to isolate the role played by the ECS formula and the role played by other sources of revenue.

Table 2.1 compares districts with high EEO adjusted NCEP (Hartford, New Haven, and Windham) specifically to several other high need, but lower spending districts. The municipal

mill rates (ACMR) and municipal tax revenue per capita are higher in Hartford than in Bridgeport, suggesting that local tax effort provides some of the explanation for the difference in EEO gaps between these two districts. However, New Haven and Windham do not unequivocally show greater local tax effort than districts such as Waterbury, New Britain and Meriden which have similar levels of poverty as New Haven and Windham, but larger EEO gaps.

**Table 2.1: Local Tax Effort in High Need Connecticut Districts, 2008**

District Name	Adjusted Equalized Net Grand List per Capita [a]		Mill Rate [b]		Total Municipal Tax Revenue per Capita [b]	
	Higher NCEP	Lower NCEP	Higher NCEP	Lower NCEP	Higher NCEP	Lower NCEP
Ansonia	.	\$19,471	.	32.32	.	\$1,400
Bridgeport	.	\$10,551	.	41.28	.	\$1,664
Hartford	\$9,854	.	63.39	.	\$1,878	.
Meriden	.	\$18,362	.	27.96	.	\$1,732
New Britain	.	\$11,226	.	45.39	.	\$1,354
New Haven	\$12,467	.	42.21	.	\$1,507	.
New London	.	\$15,563	.	30.45	.	\$1,471
Norwich	.	\$17,267	.	28.93	.	\$1,439
Waterbury	.	\$11,627	.	55.49	.	\$1,843
Windham	\$10,722	.	24.93	.	\$1,166	.
<b>Group Average</b>	\$11,014	\$14,867	43.51	37.40	\$1,517	\$1,558

*Data Sources:*  
[a] CT Department of Education (Data obtained via discovery requests)  
[b] <http://www.ct.gov/opm/cwp/view.asp?a=2984&q=383170> (Office of Policy and Management, Municipal Fiscal Indicators 2008)

Table 2.2 shows that Hartford and New Haven receive substantially greater intergovernmental aid per capita to their municipalities. This aid may take some pressure off municipal budgets compared to other large urban centers like Bridgeport. Hartford and New Haven also receive more ECS Aid and more federal revenue per pupil (average daily membership), though we've not been able to distill the reason for either. Finally, Hartford and New Haven also receive more local parent intergovernmental revenue. The difference in local revenue between Hartford and New Haven, on the one hand, and Bridgeport, on other, is striking. While municipal revenue per capita in Bridgeport is only slightly less than in Hartford and greater than in New Haven, local education revenue per pupil in Bridgeport is much lower, contributing a large share of the overall funding shortfalls and consequently the relatively large EEO gaps in Bridgeport. This deficit may result in part from higher municipal service burdens and lack of other forms of municipal aid to Bridgeport.



**Table 2.2 – Spending and Revenues Per Pupil in High Need Districts, 2008**

District Name	Total Intergovernmental Aid per Capita[a] 2008		NCEP [b] 2007-08		ECS Adj. Aid per ADM [b] 2007-08		NCES Federal Revenue per ADM [c] 2007-08		NCES Local Parent Gov. Revenue per ADM[c] 2007-08	
	Higher NCEP	Lower NCEP	Higher NCEP	Lower NCEP	Higher NCEP	Lower NCEP	Higher NCEP	Lower NCEP	Higher NCEP	Lower NCEP
Ansonia	.	\$1,779	.	\$10,308	.	\$5,006	.	\$947	.	\$3,935
Bridgeport	.	\$1,536	.	\$12,012	.	\$7,217	.	\$1,819	.	\$1,878
Hartford	\$2,749	.	\$15,706	.	\$8,056	.	\$2,066	.	\$4,272	.
Meriden	.	\$1,635	.	\$11,719	.	\$5,360	.	\$876	.	\$5,703
New Britain	.	\$1,971	.	\$11,837	.	\$6,449	.	\$1,295	.	\$4,079
New Haven	\$2,339	.	\$16,036	.	\$7,362	.	\$2,195	.	\$5,499	.
New London	.	\$1,882	.	\$13,725	.	\$6,503	.	\$1,899	.	\$5,966
Norwich	.	\$1,479	.	\$12,614	.	\$5,538	.	\$1,399	.	\$7,450
Waterbury	.	\$1,932	.	\$12,712	.	\$6,104	.	\$1,118	.	\$4,615
Windham	\$1,959	.	\$13,199	.	\$6,493	.	\$1,834	.	\$4,018	.
<b>Group Average</b>	\$2,349	\$1,745	\$14,980	\$12,132	\$7,304	\$6,025	\$2,032	\$1,336	\$4,597	\$4,804

Data Sources:

[a] CT Office of Policy and Management Municipal Fiscal Indicators.

<http://www.ct.gov/opm/cwp/view.asp?a=2984&q=383170>

[b] CT Department of Education (Data obtained via discovery requests)

[c] U.S. Census Bureau, Fiscal Survey of Local Governments, Elementary and Secondary Education Finance.

<http://www.census.gov/govs/school/>

In sum, our examination of cost and need adjusted spending reveals that districts with high shares of low-income students have larger EEO gaps. The gaps observed for high poverty districts are due in large part to the inadequate weights for low-income and LEP students in the ECS formula. There are also disparities between districts with similarly high shares of low-income poverty. Hartford and New Haven, in particular, have smaller EEO gaps than districts with similar shares of free-lunch eligible students. Hartford and New Haven are, nonetheless, below the benchmark of cost adjusted spending in the average district. Although higher state revenue, including larger ECS awards, federal revenue and local revenue all contribute to reducing Hartford and New Haven’s EEO gaps relative to other high poverty districts, higher local revenues play a particularly important role. Higher local contributions to schools in New Haven and Hartford might be explained partly by the fact that Hartford and New Haven have relatively high amounts of municipal aid, enabling those districts to devote more local tax revenues to education than districts such as Bridgeport.

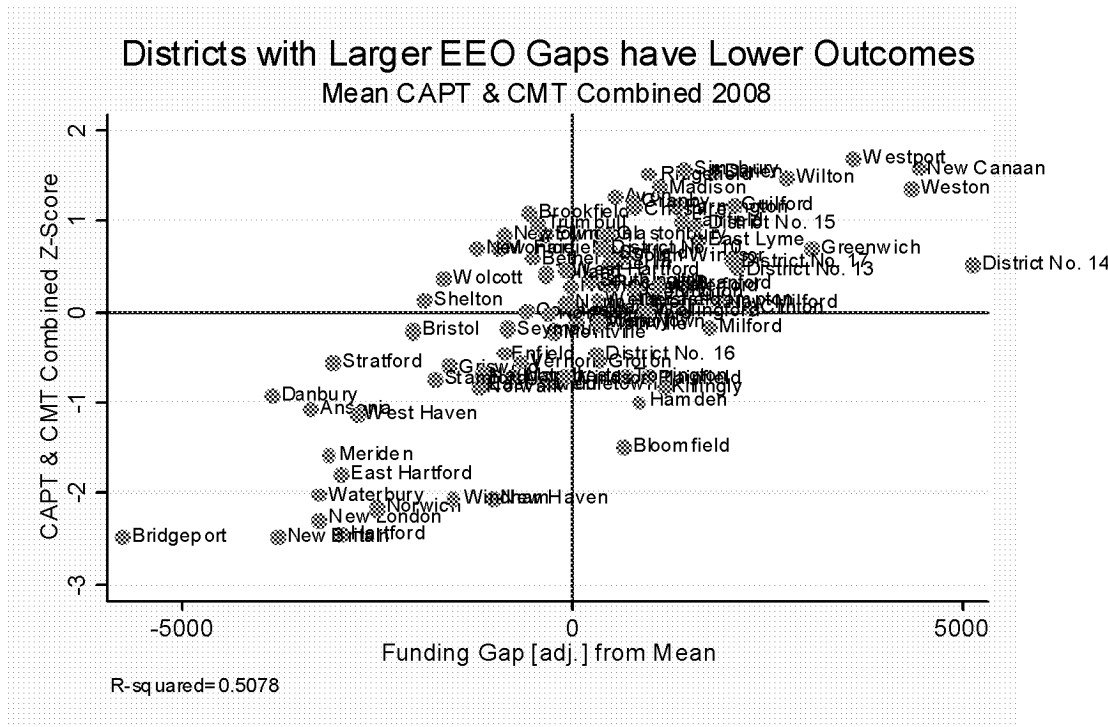
## **EEO Funding Gaps are Associated with Outcome Gaps**

Figure 2.6 presents the relationship between the EEO gaps described in the previous section and student test score achievement. The achievement measurer on the vertical axis in Figure 2.6 combines Connecticut Mastery Test (CMT) and Connecticut Academic Performance Test (CAPT) scores, including reading, math and writing scores for grades 3 to 8 CMTs and math and reading scores for grade 10 CAPTs.<sup>74</sup> Districts with EEO surpluses, or those with positive gaps, tend to have higher average standardized CAPT and CMT scores and districts with EEO deficits tend to have lower CAPT and CMT outcomes. This relationship is strong, EEO funding gaps explain about half of the variation in outcomes. Figure 2.6 shows that achievement in Connecticut school districts falls as we would expect under a school finance formula that does not provide systematic additional support for children from economically disadvantaged backgrounds. Those districts with the largest EEO deficits, Bridgeport and New Britain, also have the lowest combined outcomes across all assessments. Hartford's outcomes are also as low as those in Bridgeport and New Britain, despite somewhat higher EEO adjusted funding.

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<sup>74</sup> District level mean scale scores on math, reading and writing were summed to a combined, cumulative score across all tests. The summed mean scale scores were then standardized around the mean district summed scale score to create a standardized CMT performance index. The same approach is used to generate district level z-scores (around the mean district) with CAPT reading and math scores. The combined index is the average of the district z-scores for CMT and CAPT and exists only for those districts and in those years where both CMT and CAPT scores were available.

**Figure 2.6 – EEO Gaps and Outcomes**



### 2.3 Estimates of Children Receiving Adequate Education are Consistent with Estimates of Children Receiving Equal Opportunity

In the first section of this report, we explain how the current ECS formula is not grounded in any reasonable analysis of the needs and costs associated with achieving educational outcomes. Rather, ECS has been cobbled together over time, uses a foundation level of funding that, as of 2008-09 remains far lower than what most Connecticut districts already spend, and provides negligible additional support for children concentrated in high need districts and schools. As a result, that formula has led to systemic deprivation in varying degrees across all of the state’s high need districts and severe deprivation across a subset of those districts.

The immediately preceding analysis, focused on assessing the distribution of funding across districts relative to an equal opportunity standard. That is, we have compared spending adjusted for costs and student needs in each district to that in the average district. The fact that cost adjusted per pupil spending levels in school districts serving elevated concentrations of children in poverty are lower than average indicates that students across that state are not being provided equal educational opportunities.

If we were to consider the average Connecticut school district to be producing constitutionally adequate educational outcomes, then our equal opportunity analysis could also

be interpreted as indicating that students in high need districts are not being provided adequate educational opportunities. To the best of our knowledge, however, the State of Connecticut has never defined an adequate education nor conducted studies to determine how much it would cost different districts to provide students reasonable expectations of achieving adequate educational outcomes. Thus, it is difficult to draw firm conclusions about the adequacy of funding in Connecticut districts.

In this section, we first present comparisons of educational achievement levels between Connecticut and two very similar states, Massachusetts and New Jersey. These comparisons suggest that in fact the educational opportunities provided to low-income students in Connecticut are not adequate. Next, we take the best available estimates of the cost of meeting established educational standards, and use those estimates to quantify just how far high poverty districts in Connecticut are from providing their students reasonable expectation of attaining established achievement standards.

### **Connecticut Outcomes in Context**

The National Assessment of Educational Progress (NAEP) is the most relevant tool for comparing student achievement outcomes across states and over time. Administered by the National Center for Education Statistics, the NAEP is the largest nationally representative and continuing assessment of what America's students know and can do in various mathematics, reading, and various other subject areas. Since NAEP assessments are administered uniformly using the same sets of test booklets across the nation, NAEP results serve as a common metric for all states.<sup>75</sup> NAEP is also the most relevant tool for comparing specific subgroups of students across states, although such comparisons are most informative if limited to states with similar low-income populations.<sup>76</sup>

Figures 2.7 and 2.8 compare the National Assessment of Educational Progress (NAEP) 8<sup>th</sup> grade math and reading assessment outcomes by whether children qualify for free lunch (below 130% income threshold for poverty), reduced lunch (below 185% income threshold for poverty) or are above both thresholds. Non-low income students in Connecticut score similarly to or slightly lower than their counterparts in New Jersey in both math and reading, and lag behind non-low income students in Massachusetts. Low-income students in Connecticut score

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<sup>75</sup> For more information see <http://nces.ed.gov/nationsreportcard/about/>.

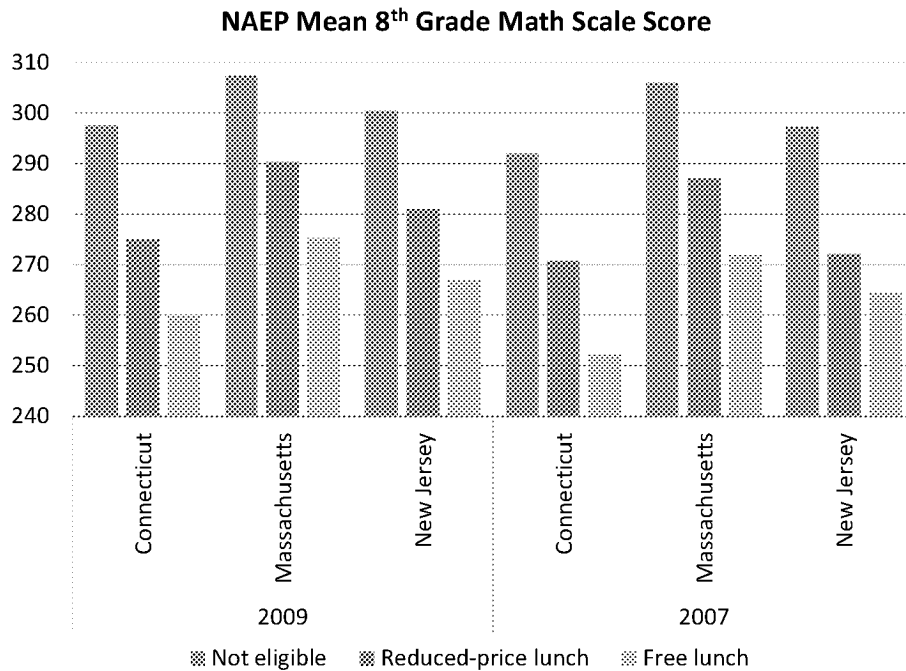
<sup>76</sup> This is particularly important where poverty-related achievement gaps are concerned since income thresholds used to identify children in poverty do not vary across states and regions, but family income distributions and costs of living do. Children falling below a specific income threshold in Texas may, in fact, bear little similarity to children falling below the same income threshold in Connecticut. The income distributions and differences in income levels among families below and above specific poverty thresholds are most comparable between Connecticut, Massachusetts and New Jersey. Specifically, Connecticut, Massachusetts and New Jersey have among the largest income gaps between children falling below and above the income threshold which qualifies students for reduced price lunch.

consistently lower than low-income students in the other states with similar income distributions (green bars). Of the three states, Connecticut is the one that puts the least systematic effort toward funding equity or adequacy for high need districts,<sup>77</sup>

As a result of the relatively low performance of Connecticut’s low income students, test score gaps between poor and non-poor students in Connecticut are larger than the gaps in New Jersey and Massachusetts. In Connecticut in 2009, students eligible for free-lunch lag behind non-poor students by 37.47 points in math and 30.83 points in reading. In New Jersey the corresponding gaps are 33.46 points in math and 27.97 points in reading. In Massachusetts the gaps are 32.01 points in math and 29.97 points in reading.

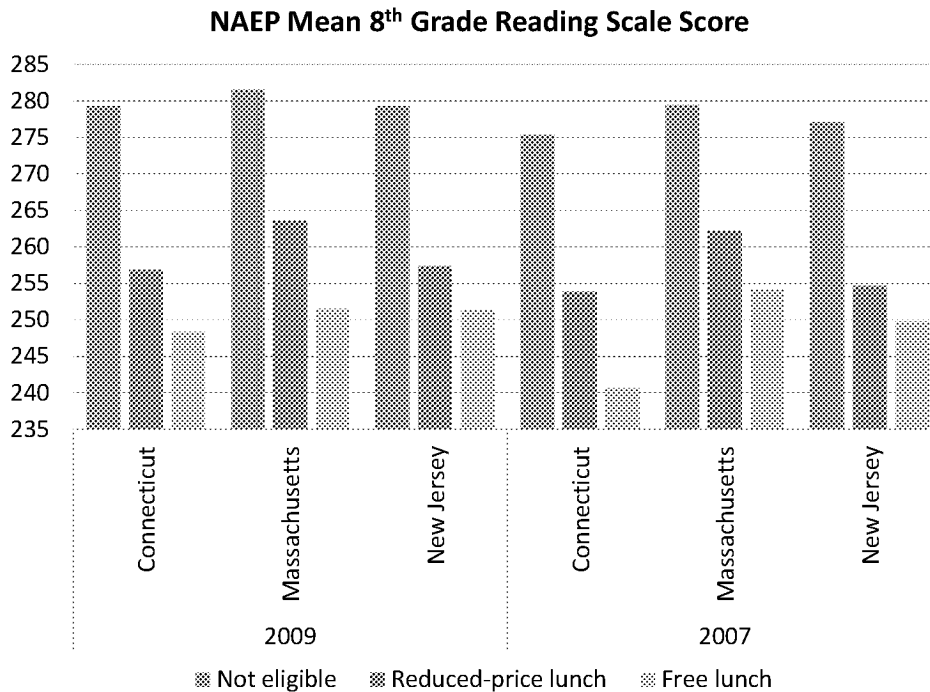
The performance of Connecticut’s neediest children, which lags well behind that of non-poor students and of needy children in other similar states, raises concerns that the state is not providing adequate education for all of its students. Benchmarks provided by New Jersey and Massachusetts suggest that many students in Connecticut are not being provided sufficient opportunity to achieve the educational outcomes required to compete in regional, national and global economies.

**Figure 2.7 - NAEP 8<sup>th</sup> Grade Reading Outcomes by Income Status**



<sup>77</sup> See [www.schoolfundingfairness.org](http://www.schoolfundingfairness.org)

**Figure 2.8 - NAEP 8<sup>th</sup> Grade Math Outcomes by Income Status**



**Determining Costs of Educational Adequacy**

We are not aware of any attempts by officials of the State Department of Education, the Governor or the Legislature to link the design of the Education Cost Sharing Formula to any analysis of the costs of achieving desired educational outcomes. Without a rationally derived benchmark for what constitutes an “adequate education” in Connecticut it is difficult to discern which districts have too few resources to provide for an adequate education and more difficult to construct a rational state school finance formula to provide for an adequate education.

While the Department of Education itself has not conducted analyses to estimate the cost of an adequate education, one set of relevant analyses is available. In 2005, John Augenblick and colleagues produced a report titled: *Estimating the Cost of An Adequate Education in Connecticut*. In this study, Augenblick and his colleagues used what is known as a resource cost model approach to determine the cost of an adequate education. In this approach, panels of educational experts are used to identify schooling inputs that would be required to achieve a

desired set of outcomes in a typical district and in districts with different student populations. For purposes of this study, an adequate education was defined as allowing 95 percent of all students to reach state goal on the CMT and CAPT, which is the 2013-14 performance target for each district in the state.<sup>78</sup>

In an appendix to this report we provide an assessment of the Augenblick study which shows that the study applied methods and produced findings consistent with other studies of educational costs. In this section we show which districts fall the furthest short of providing adequate educational opportunities if the Augenblick *et al.* estimates of the cost of an adequate education are accepted, and assess the consistency of these findings and our findings concerning EEO gaps.

### **When compared to estimates of the costs of educational adequacy, the ECS formula fails to guarantee adequate funding for large shares of Connecticut school children**

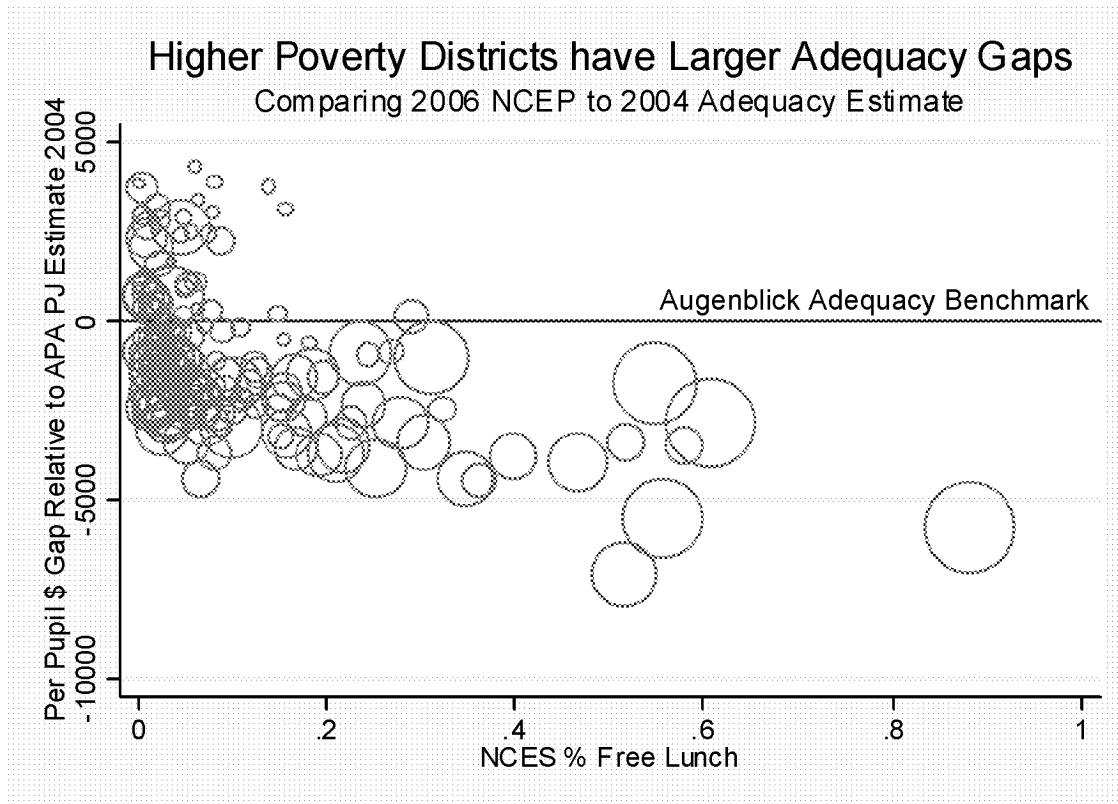
Figure 2.9 compares the gaps between 2006 NCEP and the 2004 Augenblick targets with respect to district shares of children qualified for free or reduced price lunch. The figure indicates shortfalls between existing district spending and those targets, even though the spending figures are from two years later than the cost estimates and the cost estimates are not adjusted for increases in education costs.<sup>79</sup> Figure 2.10 simply attaches names (in place of sizes) to the districts in Figure 2.8. Here, we see that Waterbury, Bridgeport and New Britain have very large adequacy funding gaps. These same districts had severe disparities with respect to equal educational opportunity (benchmarked against the average district).

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<sup>78</sup> More specifically, “For the professional judgment panels, APA created a seven page summary of the state’s legislative requirements, state board guidance and performance expectations,” which included both input and output standards. See John Augenblick, Robert Palaich, Justin Silverstein, Douglas Rose, and Dale Decesare, *Estimating the Cost of an Adequate Education in Connecticut* (Denver, CO: Augenblick, Palaich, and Associates, Inc., 2005).

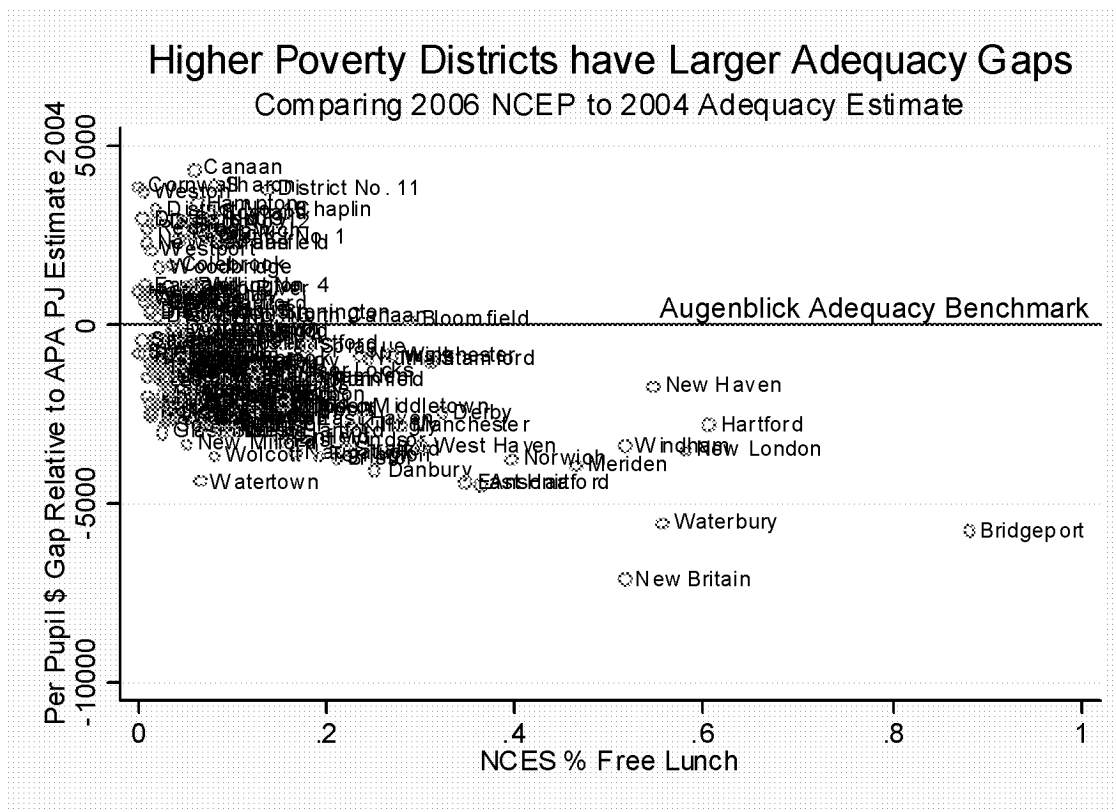
<sup>79</sup> The two year time lag is included due to insufficient data on shares of children qualifying for free or reduced lunch in earlier years. When comparing NCEP from 2004 to Augenblick adequacy cost estimates, patterns remain largely the same, but gaps slightly larger.

Figure 2.9 – Adequacy Gaps by Percent Free Lunch Eligible and Size





**Figure 2.10 – Adequacy Gaps by Percent Free-Lunch Eligible, with District Names**

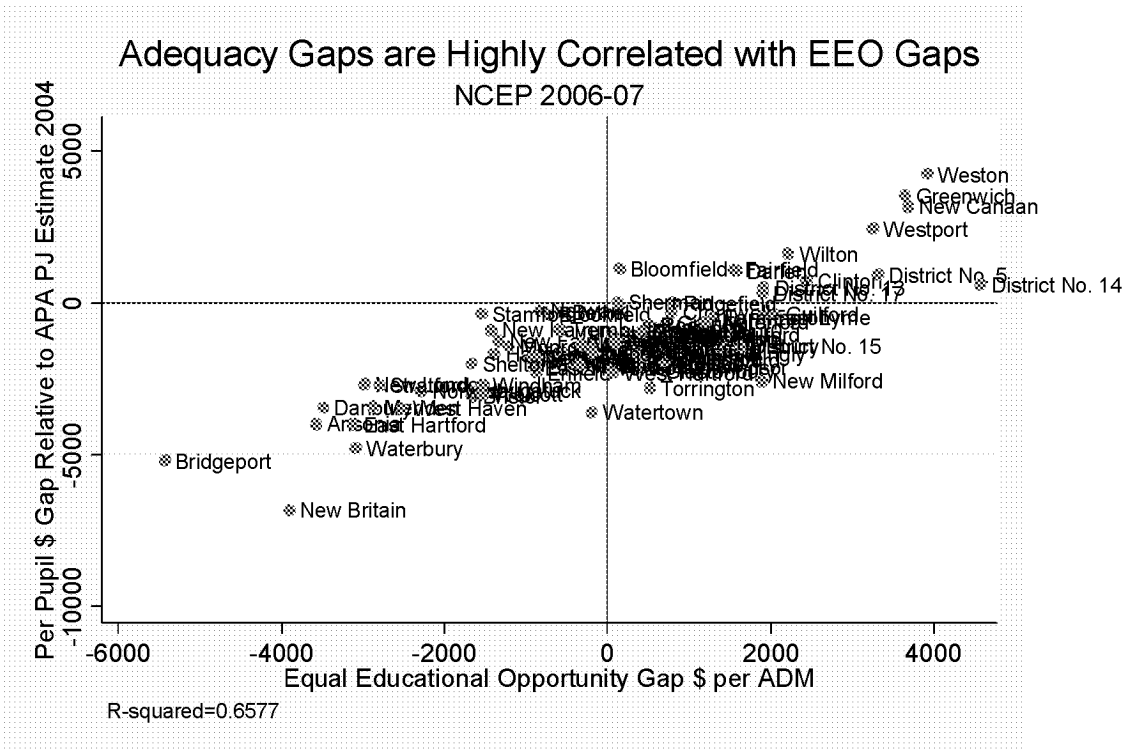


**Adequacy gaps based on Augenblick estimates are highly correlated with EEO gap estimates**

There are two important differences between EEO gap measures and the adequacy gap measures presented above. First, the way the additional costs associated with serving high need students were determined differs across the measures. In computing EEO gap measures, we drew on empirical estimates of the relationship between spending, outcomes and percentages of students in need categories to choose weights that reflect the additional cost associated with low-income and LEP students. These weights were then used to adjust spending per pupil figures to provide comparable measures of the educational opportunities provided in different districts. In contrast, the Augenblick et al. study asked panels of educational experts to identify the inputs required to achieve educational standards in schools and districts with different concentrations of low-income and LEP students. The input or resource models were then used to determine the costs of achieving educational goals in different districts. Second, the adequacy gap measure compares spending in a district to the spending needed to achieve specified educational goals, namely 95% of all students at or above goal on CMT and CAPT exams. In contrast, the EEO gap compares the opportunities provided in a district, as measured by cost and need adjusted spending, to the opportunities provided in the average district.

Despite these differences in the two gap measures, they provided a remarkably similar story about which districts are most underfunded. Figure 2.11 shows the relationship between EEO funding gaps and the adequacy funding gaps based on the Augenblick *et al.* estimates. The relationship between the two is quite strong, revealing that under either approach the most disadvantaged districts include Bridgeport, New Britain, Waterbury and Ansonia, among others and districts most advantaged including Weston, Greenwich, New Canaan and Westport.

**Figure 2.11 – The Correlation Between Adequacy Gap and EEO Gap Estimates**

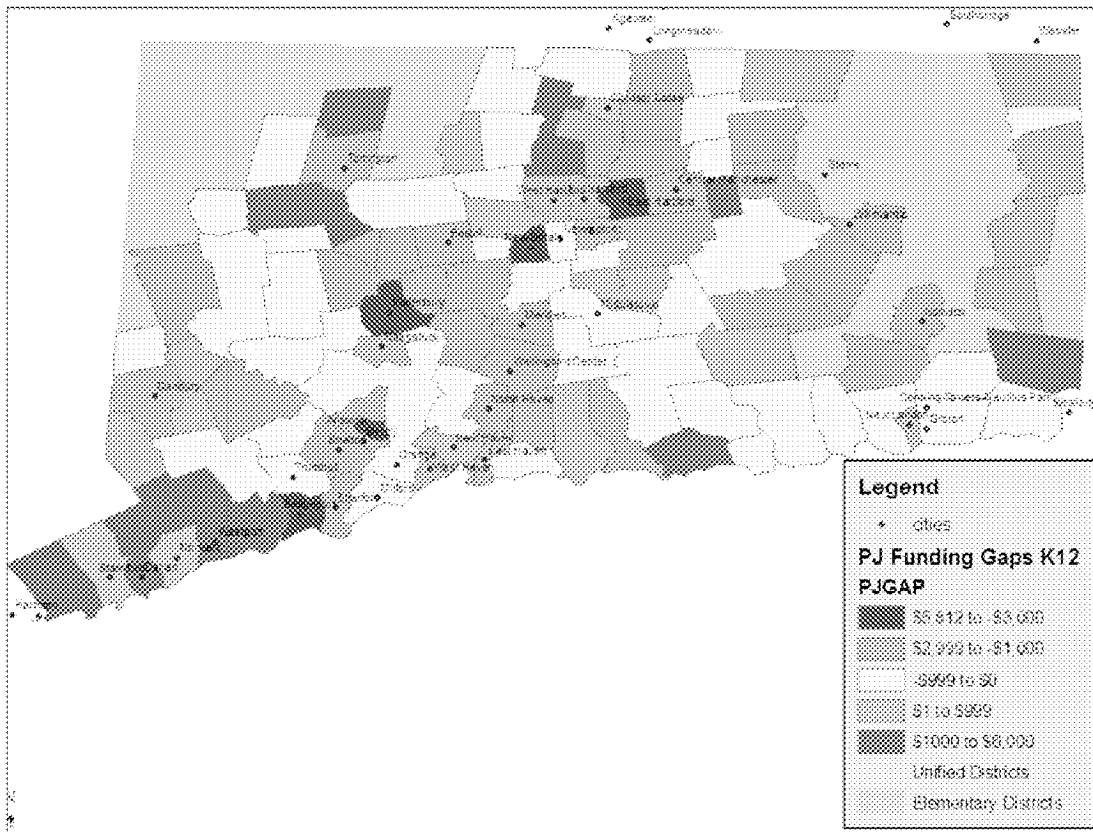


Note that the “0” line on the “x” axis – or vertical line – cuts through the average among districts, or the EEO comparison basis. The “0” line on the “y” axis, or horizontal line cuts through somewhat above the average, indicating that Augenblick targets for adequacy were somewhat above the spending levels of the average district, thereby placing larger total numbers of districts and children below adequacy than are below the EEO adjusted spending average. The implication here is that “adequate” educational outcomes – as understood through the Augenblick study – are somewhat higher than current average outcomes.

Figure 2.12 provides geographic perspective on the funding gaps with respect to Augenblick cost estimates. Comparison of this figure with Figure 2.5 above indicates that with a few exceptions, the estimated adequacy gaps are largely consistent with EEO funding gaps. Adequacy gaps based on Augenblick estimates indicate that Stamford and Norwalk are providing their students adequate educational opportunities, while the EEO gap estimates presented above

indicate that these districts had fairly large EEO gaps (see Figure 2.5). Also, the adequacy gap estimates are somewhat smaller than the EEO gap estimates in New London and Danbury.

**Figure 2.12 - Distribution of Adequacy Funding Gaps**



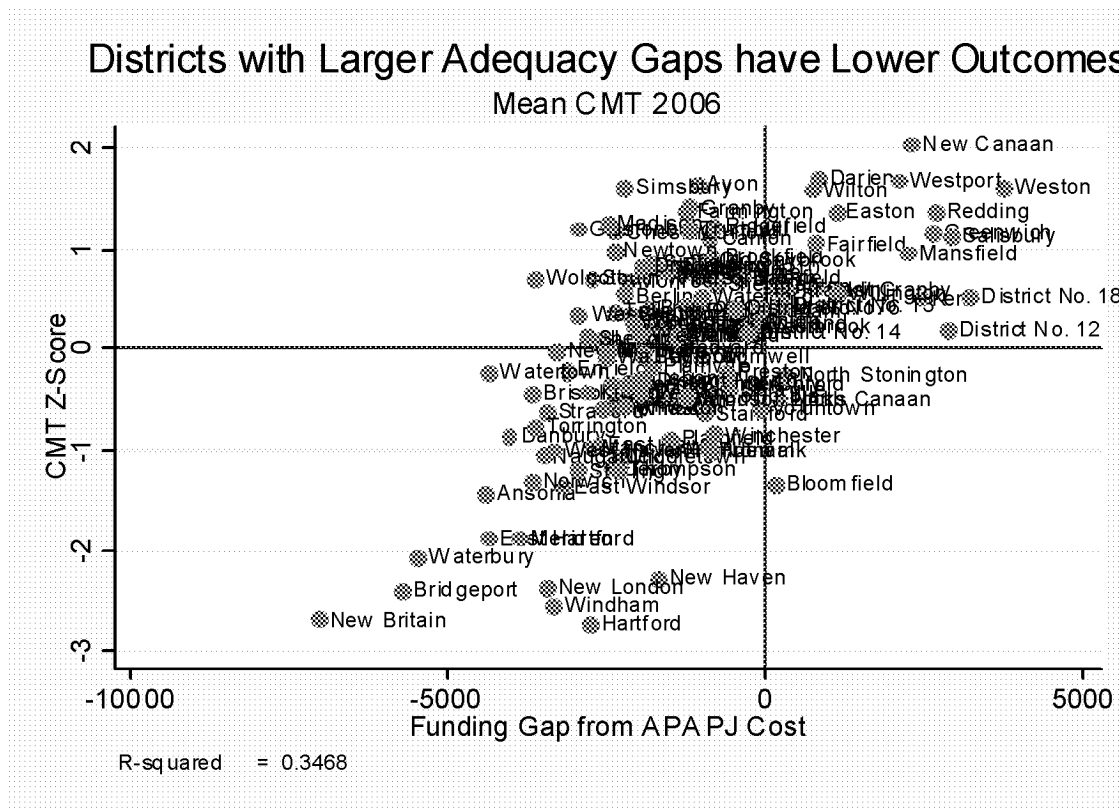
**School districts with larger adequacy gaps have systematically lower educational outcomes**

Figure 2.13 relates the Augenblick adequacy gaps with district level results on the Connecticut Mastery Test. On the vertical axis, we have the relative performance in standard deviations for each district on the CMTs, including math, reading and writing in grades 3 through 8.<sup>80</sup> The relationship between adequacy funding gaps based on the Augenblick et al. estimates and outcome measures is somewhat weaker than the relationship between our previous EEO funding gaps and outcome measures (r-squared of .3468, or correlation of .589). As

<sup>80</sup> District level mean scale scores on math, reading and writing were summed to a combined, cumulative score across all tests. The summed mean scale scores were then standardized around the mean district summed scale score to create a standardized CMT performance index.

expected, districts with significant adequacy gaps, including New Britain, Bridgeport and Waterbury, along with New London, Windham and Hartford, also have very low outcomes.

**Figure 2.13 – Adequacy Gaps and Outcomes**



In summary, Figure 2.13 here, taken together with Figure 2.11 above, indicate a high degree of consistency between districts estimated by Augenblick and associates as having inadequate resources, and districts identify by us as being disadvantaged with respect to equal opportunity.

### **3.0 Districts with large funding gaps also have significant resource gaps**

In the previous section, we documented the unequal distribution of educational opportunities, as measured by cost and need adjusted expenditures, across Connecticut school districts. Specifically, we showed that districts serving high proportions of low-income students have adjusted spending levels well-below the average district in the state. We refer to these as districts with equal educational opportunity (EEO) deficits. We also showed that districts with EEO deficits tend to have less funding than the only available estimates indicate are required to meet established educational standards.

The assumption underlying the analysis in the last section is that districts with significant EEO deficits have access to fewer resources than they need to achieve educational outcomes that are either comparable to the average district or to established standards. In this section, we examine the resources and student outcomes in high need districts with EEO deficits more directly.

We begin by identifying a subset of districts with EEO deficits which we refer to as “severe disparity” districts. These districts have very large EEO deficits, very low average scores on state exams, very high rates of low-income children, and elevated rates of LEP/ELL students. Next we compare resource levels in three sets of districts: high spending, high outcome districts, low spending, low outcome districts, and severe disparity districts. Particularly we compare average class sizes, teacher salary and experience levels, curricular offerings, and staff assignments across the three types of districts.

High need districts should have sufficient resources to address deficits in basic subjects and provide enrichment opportunities. Because their students often have deficits in important foundational subjects such elementary math and reading, high need districts need to devote more resources to improving achievement in those subjects. These districts should also have sufficient resources to provide equitable opportunities for their students to participate in advanced courses and other co-curricular opportunities. Such opportunities can significantly influence access to higher education. We find that low resource, low outcome and severe disparity districts do not provide the smaller class-sizes, higher paid teachers, or more experienced teachers that might help to improve instruction in basic subjects, nor do they provide their student access to arts, music, library support, gifted and talented programs, or even chemistry, to the extent that low need/high resource districts do.

More specifically, in this section, we show that:

1. School districts with very large EEO funding gaps (over \$3,000 per pupil), low outcomes ( $>1.5$  Standard Deviations below mean) and with elevated LEP/ELL populations have systematically larger class sizes than more advantaged districts at all grade levels.

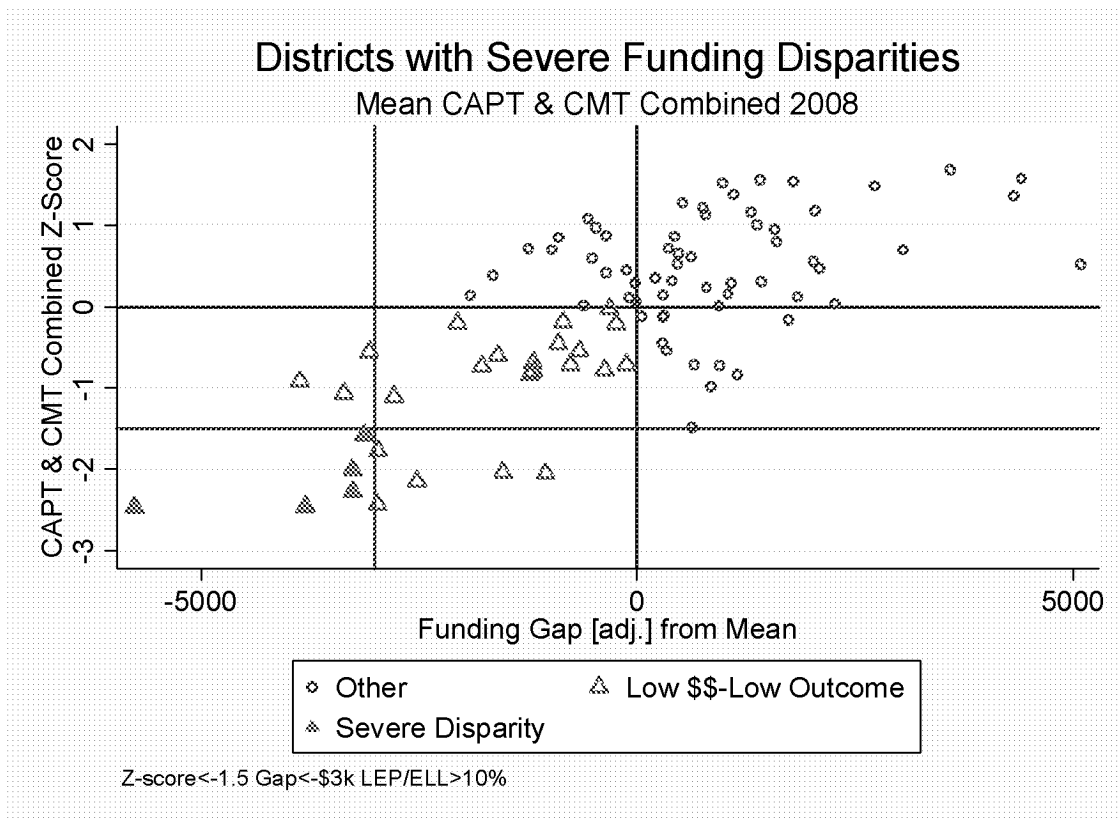
2. School districts with low EEO adjusted resource levels and low current student outcomes have lower teacher salaries than those in more advantaged districts, and gaps in teacher salaries have grown in recent years.
3. School districts with low EEO adjusted resource levels and low current student outcomes have higher concentrations of novice teachers than more advantaged districts.
4. Students attending low EEO adjusted resource districts with low outcomes have less access to either advanced or enriched curricular opportunities, including;
  - a. Substantially lower 8<sup>th</sup> grade participation rates in high school level math or world languages
  - b. Far fewer contact hours in 5<sup>th</sup> grade in art, physical education and music
  - c. Far fewer assigned teaching and support staff per pupil in areas including Chemistry, French, Latin, Physics, World History, Orchestra, Band, Gifted and Talented Programs, and school librarians/media specialists.

### **3.1 High need districts with EEO deficits also have poor educational outcomes**

Figure 3.1 presents in slightly modified form a figure presented in Section 2 which depicts that relationship between the EEO gaps and combined CMT and CAPT assessment scores. As discussed in Section 2, districts with EEO surpluses, or those with positive gaps, tend to also have higher average CAPT and CMT scores and districts with EEO deficits tend to have lower CAPT and CMT outcomes.

The upper left quadrant of Figure 3.1, quadrant 1, includes high performing districts with below average resource levels; quadrant 2, upper right, includes high performing districts with high resource levels; quadrant 3, lower right, includes low performing districts with above average resource levels; and quadrant 4, lower left, includes low performing districts with low resource levels. The districts in quadrant 2 are the most advantaged and those in quadrant 4 are the most disadvantaged. Although, some of the districts with above average outcomes have EEO deficits, those districts in quadrant 1, only three of the districts with above average test scores have EEO deficits larger than \$1,000 and none have deficits larger than \$2,000. In contrast, all but two of the 12 districts that have EEO deficits greater than \$2,500 have achievement levels one or more standard deviations below the mean. Appendix B provides a full listing of districts in each quadrant.

**Figure 3.1 – Severe Funding Disparities and Outcomes**



Some authors use anecdotes focused on districts that achieve high outcomes with little money and make strong claims of fraud and waste regarding districts with relatively high levels of spending but poor student outcomes.<sup>81</sup> Districts with low resource levels, but unexpectedly high levels of performance would appear far away from the origin in quadrant 1. Districts with high resource, but unexpectedly low outcome levels would appear far away from the origin in quadrant 3. Figure 3.1 does not reveal any districts at the extremes in either quadrant 1 or 3, which indicates that districts that perform heroically in the absence of sufficient resources, as well as districts high levels of waste, are indeed quite exceptional cases.

### 3.2 Comparison of Three Sets of Districts

In this section, we explore the resource and resource allocation differences across districts that fall into quadrants 2 and 4. We also examine the resources used in districts at the

<sup>81</sup> See: [http://www.americanprogress.org/issues/2011/01/educational\\_productivity/index.html](http://www.americanprogress.org/issues/2011/01/educational_productivity/index.html)

extremes of quadrant 4 – those with lowest outcomes and greatest needs. More specifically, we examine separately resource levels in the five districts that have

- EEO funding deficits of greater than \$3,000 per pupil;
- average standardized assessment scores more than 1.5 standard deviations below the mean district; and
- LEP/ELL shares in 2007-08 greater than 10%.

We referred to these districts as severe disparity districts, and they include Meriden, Waterbury, New London, Bridgeport and New Britain. A list of districts in each quadrant is provided in Appendix B.

Here, we provide a few snapshots of student composition, spending and outcome differences across districts in the upper right quadrant, the lower left quadrant, and more specifically the severe disparity districts. In the next subsection of this report, we explore in greater depth the lack of resources available in severe disparity districts as well as continuing our contrast of high spending, high outcome and low spending/low outcome districts.

Figure 3.2 shows that the average mean scale scores for our high spending, high outcome districts is nearly 1 standard deviation above the average district. The average mean scale scores for low spending/low outcome districts is over a standard deviation below the average. The average for our severe disparity group is over 2 standard deviations below the average.

Patterns are similar across other outcome measures shown in Figure 3.3. While 80% of children in high resource, high outcome districts take the SAT, about 65% do in low resource, low outcome districts and less than half in severe disparity districts. About 75% of students from high resource, high outcome districts attend 4 year colleges, compared to fewer than half in low resource, low outcome districts and less than 40% in severe disparity districts. Dropout rates are also elevated in severe disparity districts, and graduate rates below 80% in severe disparity districts compared with much higher rates in high resource, high outcome districts.<sup>82</sup>

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<sup>82</sup> Graduation rates should generally be viewed with caution. Ideally, graduation rates would be measured by cohorts, tracking the numbers of 9<sup>th</sup> graders who eventually graduate in 4 years and appropriately accounting for legitimate moves into and out of the district or school. Little or no documentation is provided regarding the CTDOE graduation rate measure: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/GraduationDTVviewer.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/GraduationDTVviewer.aspx). The measure would appear to be calculated as total numbers of graduates divided by total members of the 12<sup>th</sup> grade class, likely overstating graduation rates – relative to cohort graduation rates.



Figure 3.2 - Assessment Outcome Disparities

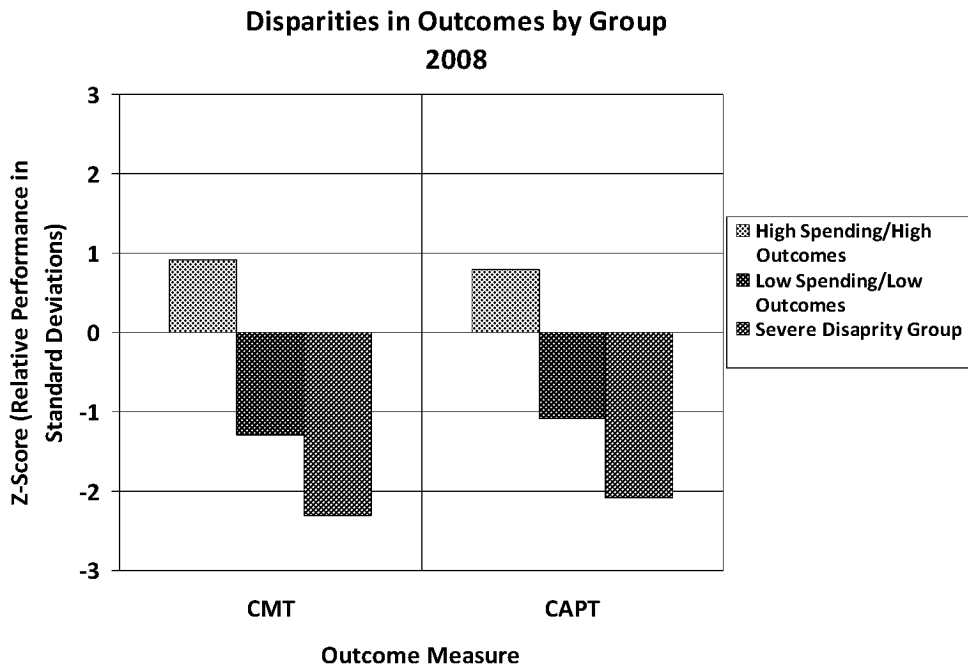
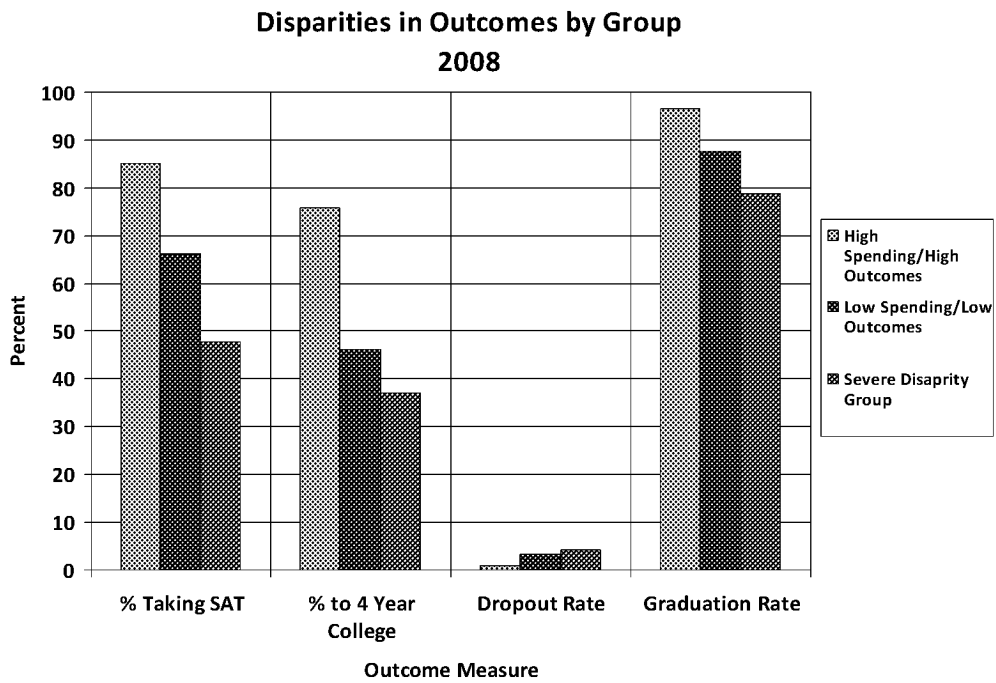


Figure 3.3 - Postsecondary Outcome Disparities



As shown in Table 3.1, the first group of high spending, high outcome districts are generally low minority concentration districts, with low poverty, relatively high nominal NCEP and high EEO adjusted NCEP (because their cost of comparable outcomes index is less than 1.0, or less than average). The low spending low outcome group of districts as a whole are districts that have slightly higher nominal NCEP, but much lower EEO adjusted NCEP than the high spending, high outcomes districts. These districts are high minority, high poverty concentration districts. The severe disparity group – a subset of the low spending low outcomes group – are most strikingly different, with by far the highest poverty rates and very high minority concentrations. These districts also have relatively low nominal spending and exceptionally low EEO adjusted spending.

**Table 3.1 - District Comparison Groups**

	High Spending/ High Outcome	Low Spending/ Low Outcome	Severe Disparity Group
<b>Demographics</b>			
% Black [a]	2.4%	25.8%	28.7%
% Hispanic [a]	4.6%	32.2%	46.3%
% ELL [b]	1.8%	10.5%	13.6%
% Poverty [c]	3.5%	17.3%	22.4%
% Free or Reduced Lunch [a]	5.2%	55.4%	76.9%
<b>Spending</b>			
NCEP [d]	\$12,547	\$12,932	\$12,224
EEO Adj. NCEP [e]	\$12,902	\$8,847	\$7,170
<b>Outcomes</b>			
CAPT [f]	540	446	416
CMT [f]	4,870	4,182	3,972

*Data Sources:*

[a] Data source: National Center for Education Statistics, Common Core of Data 2007-08. [www.nces.ed.gov/ccd](http://www.nces.ed.gov/ccd)

[b] Connecticut State Department of Education, Connecticut Education Data and Research. ELL Population Download: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/EIIDT.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/EIIDT.aspx)

[c] U.S. Census Bureau Small Area Income and Poverty Estimates. <http://www.census.gov/did/www/saie/data/schools/data/2007.html>

[d] Net Current Expenditures per Pupil in ADM 2007-08 (obtained through discovery, file: nce\_history, July 2009)

[e] Calculated by authors by dividing NCEP 2007-08 by EEO Index as described herein

[f] Connecticut State Department of Education, Connecticut Education Data and Research. CMT:

[http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/CMTLandingDT.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/CMTLandingDT.aspx), CAPT:

[http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/CAPTlandingDT.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/CAPTlandingDT.aspx)

### **3.3 Districts with low outcomes and constrained financial inputs lack in sufficient programs and services**

Analyses in the previous sections were based on an assumption that in order to achieve common standards, some children require more resources than others. In other words, the per pupil cost of providing equal educational opportunity varies by the population of children served by local public school districts. Additional resources are required to provide for the types of educational programs and other supports needed to provide comparable quality educational programs and services, and to provide specialized programs and services associated with improved outcomes for low income populations. For example, because student population characteristics influence teacher job choices,<sup>83</sup> high poverty districts must pay higher salaries than low need districts to provide comparable quality teachers. Further, higher need districts require more teachers in order to implement such strategies as reducing class sizes and may need teachers with additional qualifications, like the ability to speak multiple languages.

In addition, to providing services needed to achieve basic educational outcomes, higher need districts require sufficient resources such that they can maintain rigorous, sufficiently broad and deep high school curriculum to provide their graduates with access to colleges and universities. High need districts should not be forced to reduce or eliminate elective and advanced course offerings that serve as critical milestones for college going students.

In this section we explore the distribution of programs and services across Connecticut school districts that fall into the groups identified in the previous section, specifically a) high resource, high outcome districts, b) low resource, low outcome districts and c) severe disparity, high need districts. A list of the districts in each quadrant is provided in Appendix B. We use a variety of CTDOE data sources to examine resource and service differences across the three types of districts. We examine several types of resources and services including:

- 1) class size variation by grade level;
- 2) teacher salaries over time and by experience;
- 3) teacher experience levels (including the concentration of novice teachers);
- 4) the depth and breadth of curricular offerings as evidenced through data on teacher assignments; and
- 5) participation rates in advanced course offerings.

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<sup>83</sup> Hanushek, Kain, and Rivkin, “Why public schools lose teachers.”

We selected these particular measures of resources and services because data were available and because substantial literatures suggest that they are important determinants of student performance or other student outcomes.

This section addresses how funding constraints resulting from the ECS formula lead to inequities in programs and services available to Connecticut school children.

### **Class Size**

One potential use for additional state aid by high poverty districts is to provide smaller class sizes, or at least to increase quantities of school staff. Ample amounts of research indicates that children in smaller classes achieve better outcomes, both academic and otherwise, and that class size reduction can be an effective strategy for closing racial or socio-economic achievement gaps.<sup>84</sup> Whether or not reducing class-sizes is the most efficient use of additional educational dollars is less certain. For instance, using additional funding to recruit and retain “better” teachers is another promising approach to improve education in high poverty settings. The marginal benefits of spending additional dollars on reducing class-size, increasing teacher quality, or other program improvements are not known precisely enough to provide clear policy guidance. However, ample evidence indicates that if additional funding is used for class size reduction, outcomes can be improved and achievement gaps reduced. What is also known is that if sufficient resources for class size reduction are not available, class sizes cannot be reduced and other alternative strategies of comparable cost cannot be tried.

Among more recent studies on the topic, in an article in the *American Journal of Education*, Konstantopolous and Chun summarized:

We used data from Project STAR and the Lasting Benefits Study to examine the long-term effects of small classes on the achievement gap in mathematics, reading, and science scores (Stanford Achievement Test). The results consistently indicated that all types of students benefit more in later grades from being in small classes in early grades. These positive effects are significant through grade 8. Longer periods in small classes produced higher increases in achievement in later

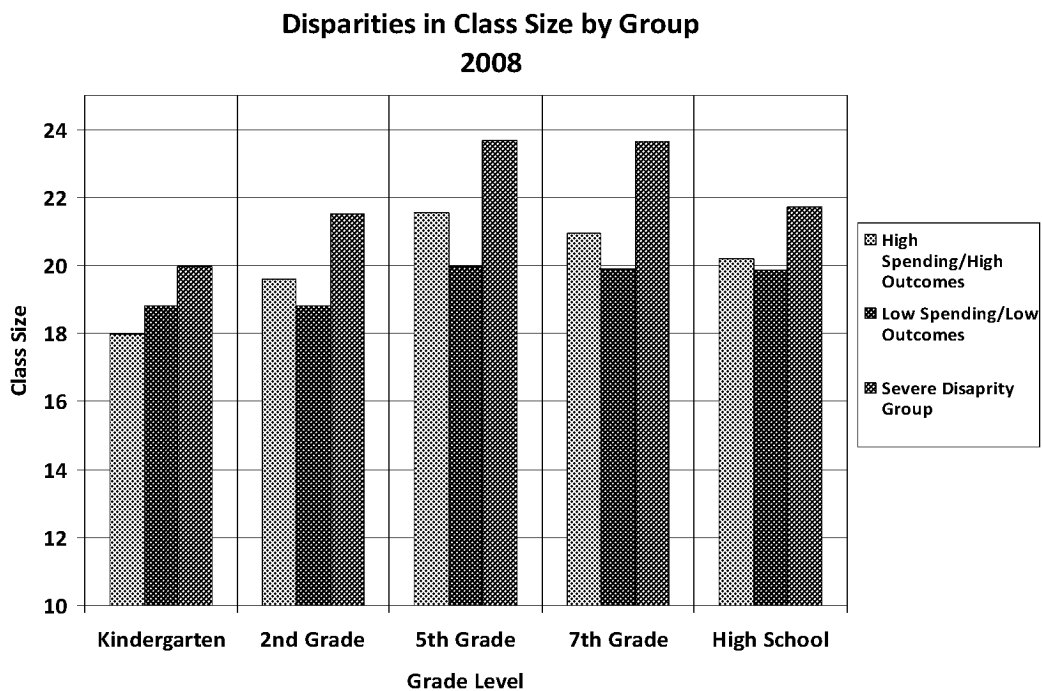
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<sup>84</sup> See <http://www2.ed.gov/rschstat/research/pubs/rigorousetid/rigorousetid.pdf>; Jeremy D. Finn and Charles M. Achilles, “Tennessee’s Class Size Study: Findings, Implications, Misconceptions,” *Educational Evaluation and Policy Analysis*, 21, no. 2 (Summer 2009): 97-109; Jeremy Finn et. al, “The Enduring Effects of Small Classes,” *Teachers College Record*, 103, no. 2, (April 2001): 145–183; <http://www.tcrecord.org/pdf/10725.pdf>; Alan Krueger, “Would Smaller Class Sizes Help Close the Black-White Achievement Gap.” Working Paper #451 (Princeton, NJ: Industrial Relations Section, Department of Economics, Princeton University, 2001) [http://www.irs.princeton.edu/pubs/working\\_papers.html](http://www.irs.princeton.edu/pubs/working_papers.html); Henry M. Levin, “The Public Returns to Public Educational Investments in African American Males,” Dijon Conference, University of Bourgogne, France. May 2006. <http://www.u-bourgogne.fr/colloque-iredu/posterscom/communications/LEVIN.pdf>; Spyros Konstantopoulos and Vicki Chun, “What Are the Long-Term Effects of Small Classes on the Achievement Gap? Evidence from the Lasting Benefits Study,” *American Journal of Education* 116, no. 1 (November 2009): 125-154.

grades for all types of students. For certain grades, in reading and science, low achievers seem to benefit more from being in small classes for longer periods. It appears that the lasting benefits of the cumulative effects of small classes may reduce the achievement gap in reading and science in some of the later grades.<sup>85</sup>

To provide equal opportunities to achieve common outcomes, high need districts and particularly the severe disparities district would need to provide smaller class-sizes than low need districts. However, this is not what we see in Connecticut. Figure 3.4 shows the average class sizes for high spending/high outcome districts, low spending/low outcome districts, and severe disparity districts, by grade level. At the kindergarten level, the high resource, high outcome districts have the smallest class sizes. In other grades, low spending/low outcome districts have, on average, been able to achieve modest class size reduction compared to their high spending/high outcome peers. But, districts facing severe resource disparities and high student needs have not had the resources to leverage toward class size reduction and, as a group, have systematically larger class sizes at all grade levels.

**Figure 3.4 – Class Size Disparities**



Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/AverageClassSizeDT.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/AverageClassSizeDT.aspx)

<sup>85</sup> Spyros and Chun, "What Are the Long-Term Effects of Small Classes on the Achievement Gap? Evidence from the Lasting Benefits Study," p. 125.

## Teacher salaries

Ample research suggests that teacher quality is an important determinant of student achievement.<sup>86</sup> Although not the only policy instrument available, one way districts can try to attract higher quality teachers is by increasing salaries. Teacher salaries, however, are dependent on availability of state and local revenues. Moreover, district working conditions play a significant role in influencing the job choices of teachers. All else equal, teachers tend to avoid or exit schools with higher concentrations of children in poverty and higher concentrations of minority - specifically black - children. Some researchers have attempted to estimate the extent of salary differentials needed to offset the problem of teachers transferring from predominantly black schools. For example, Hanushek, Kain, and Rivkin (2004) note: “A school with 10% more black students would require about 10% higher salaries in order to neutralize the increased probability of leaving.”<sup>87</sup> Thus, to attract equal quality teachers high need districts and particularly the severe disparity districts would likely need to pay higher salaries than low need districts. The analyses presented here shows that that is not the case.

At least two considerations limit the usefulness of simply comparing average salary levels across districts. First, competitive wages for professional occupations vary across regions in the state. Because, for instance, competitive wages in the Bridgeport-Norwalk-Stamford area are about 20 percent higher than in the Hartford area, a given nominal salary in Bridgeport has different purchasing power than the same nominal salary in Hartford. Second, teacher salaries vary substantially across different experience levels within districts. Thus, two districts that pay identical salaries for teachers with the same level of experience can have much different average salaries if one district has more experienced teachers than the other. Because differences in the experience distribution of teachers across districts are interesting in their own right, we examine them directly in the next section. In this section, we maintain focus on differences in salaries controlling for experience levels.

To address these issues, we estimated a salary model for Connecticut teachers using individual teacher level data on Connecticut teachers.<sup>88</sup> The goal of the wage model is to determine the average disparity in teacher salary between a) high spending/high outcomes districts and low spending/low outcomes districts and b) between severe disparity districts and

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<sup>86</sup> For example, see Eric A. Hanushek, John F. Kain, and Steven G. Rivkin, “Teachers, Schools, and Academic Achievement,” *Econometrica* 72, no. 3 (Fall 2005): 417-458; Daniel Aaronson, Lisa Barrow, and William Sander, “Teachers and Student Achievement In Chicago Public High Schools,” Federal Reserve Bank of Chicago Working Paper 2002-28, 2002.

<sup>87</sup> Hanushek, Kain, Rivkin, “Why Public Schools Lose Teachers,” p. 350

<sup>88</sup> Connecticut Department of Education provides a 6 year extractable panel (2005 to 2010) of individual teacher level data, available at: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StateStaffReport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StateStaffReport.aspx). This file includes just over 50,000 cases (individuals) per year, with indicators of district and school assignment, teacher position type, assignment and salaries.

other low spending/low outcomes districts controlling for teacher experience levels and the region of the state where the teacher works. The resulting estimates indicate, on average, how much more or less a teacher with similar qualifications, in the same labor market, is expected to be paid in FTE salary if working in a disadvantaged district.

The results of the regression analysis are presented in Table 3.2. The results indicate that salaries for teachers with more experience are higher, that teachers with advanced degrees, controlling for experience level are paid more, and that teachers tend to be paid less in regions other than Bridgeport-Stamford, and particularly so in the more rural parts of the state. With respect to differences across the three categories of districts, the results indicate that all else equal:

- 1) A teacher in a low spending/low outcome district is likely to be paid about \$1,000 less than a comparable teacher in a high spending/high outcome district in the same labor market;
- 2) A teacher in a severe disparity district is likely to be paid about \$1,800 less than a comparable teacher in all other districts in the same labor market;
- 3) A teacher in a severe disparity district is likely to be paid about \$1,600 less than a comparable teacher in other low spending/low outcome districts in the same labor market.

Thus, despite the expectation that severe disparity district would need to pay higher salaries to attract teachers of equal quality, we find they pay lower salaries than other districts in the same regions.

Figure 3.5 uses a variation on the statistical model in Table 3.2, including an interaction term between district group and experience category, to project the expected salaries of teachers in each experience category, holding other teacher characteristics constant. By interacting district group and experience, we are able to determine whether at some experience levels, teachers in severe disparity districts have more or less competitive salaries (whereas the model in Table 3.2 tells us only that, on average, across all experience levels, teachers' salaries differ across district groups).

**Table 3.2 - Regression Estimates of Connecticut Teacher Salary Structures**

DV = FTE Salary	High Spending, High Outcome v. Low Spending Low Outcome Districts			High Spending, High Outcome v. Severe Disparity Districts			Low Spending/Low Outcome v. Severe Disparity Districts		
Independent Variables	Coef.	Std. Err.	P>t	Coef.	Std. Err.	P>t	Coef.	Std. Err.	P>t
<b>Spending, Outcome Category</b>									
High Spending, High Outcomes									
Low Spending, Low Outcomes	<b>-\$1,073</b>	\$38	*						
<b>Severe Disparity Group</b>									
				<b>-\$1,841</b>	\$52	*	<b>-\$1,673</b>	\$59	*
<b>Year</b>									
2006	\$1,746	\$57	*	\$1,771	\$53	*	\$1,661	\$86	*
2007	\$3,624	\$57	*	\$3,687	\$53	*	\$3,392	\$86	*
2008	\$5,284	\$57	*	\$5,385	\$53	*	\$4,744	\$86	*
2009	\$7,230	\$57	*	\$7,347	\$53	*	\$6,666	\$86	*
2010	\$8,934	\$57	*	\$8,992	\$53	*	\$7,980	\$87	*
<b>Experience Level</b>									
0-4									
5-9	\$19,462	\$57	*	\$18,925	\$53	*	\$19,815	\$85	*
10-14	\$25,365	\$66	*	\$24,915	\$61	*	\$25,126	\$100	*
15-19	\$26,955	\$68	*	\$26,469	\$63	*	\$26,847	\$104	*
20-24	\$27,873	\$69	*	\$27,324	\$64	*	\$27,879	\$104	*
25-29	\$28,437	\$68	*	\$27,882	\$64	*	\$28,693	\$103	*
30-34	\$29,126	\$94	*	\$28,480	\$89	*	\$29,282	\$145	*
35-39	\$30,133	\$234	*	\$29,437	\$225	*	\$29,206	\$374	*
<b>Degree Level</b>									
BACHELORS									*
MASTERS	<b>\$3,978</b>	<b>\$42</b>	*	<b>\$3,794</b>	<b>\$39</b>	*	<b>\$3,968</b>	<b>\$61</b>	
SIXTH YEAR	\$8,605	\$61	*	\$8,819	\$58	*	\$8,029	\$93	*
PHD	\$13,555	\$165	*	\$13,249	\$159	*	\$12,977	\$245	*
<b>CBSA</b>									
Bridgeport-Stamford									
Hartford-West Hartford	-\$4,861	\$42	*	-\$4,904	\$40	*	-\$3,318	\$65	
New Haven-Milford, CT	-\$7,886	\$46	*	-\$7,359	\$44	*	-\$7,212	\$65	*
Norwich-New London, CT	-\$7,806	\$73	*	-\$7,900	\$65	*	-\$7,924	\$121	*
Torrington, CT	-\$9,307	\$109	*	-\$9,320	\$78	*			*
Willimantic, CT	-\$12,761	\$129	*	-\$12,803	\$92	*	-\$11,630	\$208	*
<b>Constant</b>	\$45,167	\$66	*	\$44,505	\$58	*	\$44,216	\$92	*
<b>R-squared</b>	<b>0.8111</b>			<b>0.7967</b>			<b>0.7963</b>		

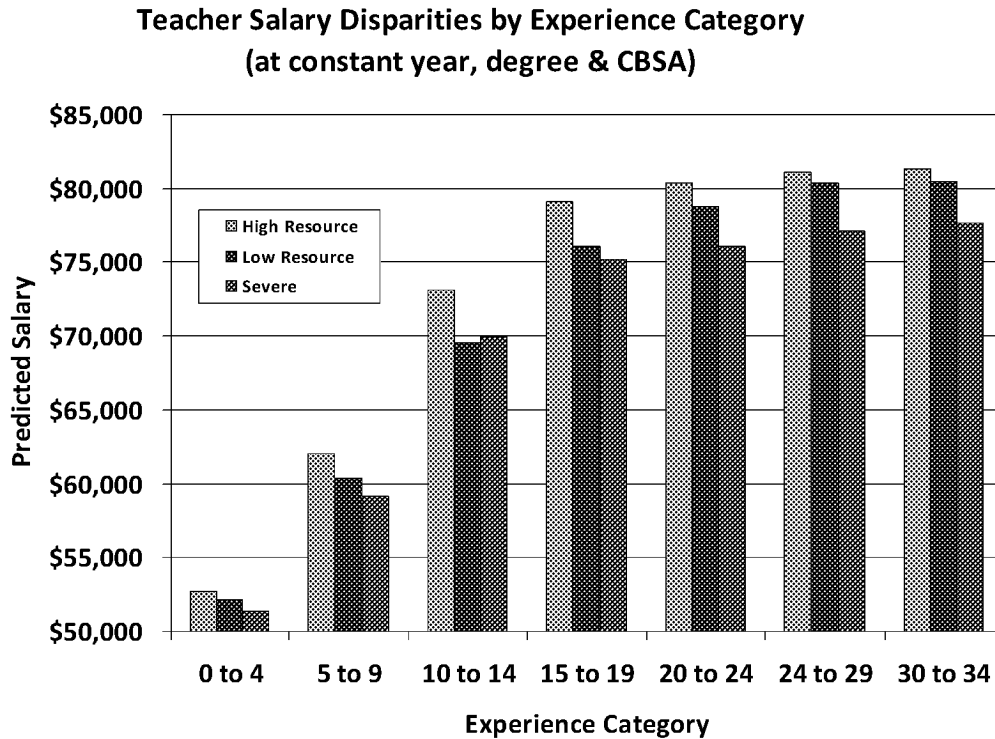
\*p<.05, \*\*p<.10

Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StaffExport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StaffExport.aspx)

At all experience levels, teachers in high spending/high outcome districts are paid more than their otherwise comparable peers in low spending/low outcome districts or in severe disparity districts. The gap appears to grow at higher levels of experience for teachers in severe disparity districts, and the gap is largest for teachers in low spending/low outcome districts across the mid-ranges of experience. For example, in the first few years of teaching, a teacher in a severe disparity district earns a wage of about \$51,300 compared to a teacher in an advantaged district at \$52,707, a difference of just under \$1,400. But, by the 10<sup>th</sup> year of experience, that wage gap has grown to over \$3,000, by the 15<sup>th</sup> year, nearly \$4,000 and by the 20<sup>th</sup> year, over \$4,300.



**Figure 3.5 – Teacher Salary Disparities**

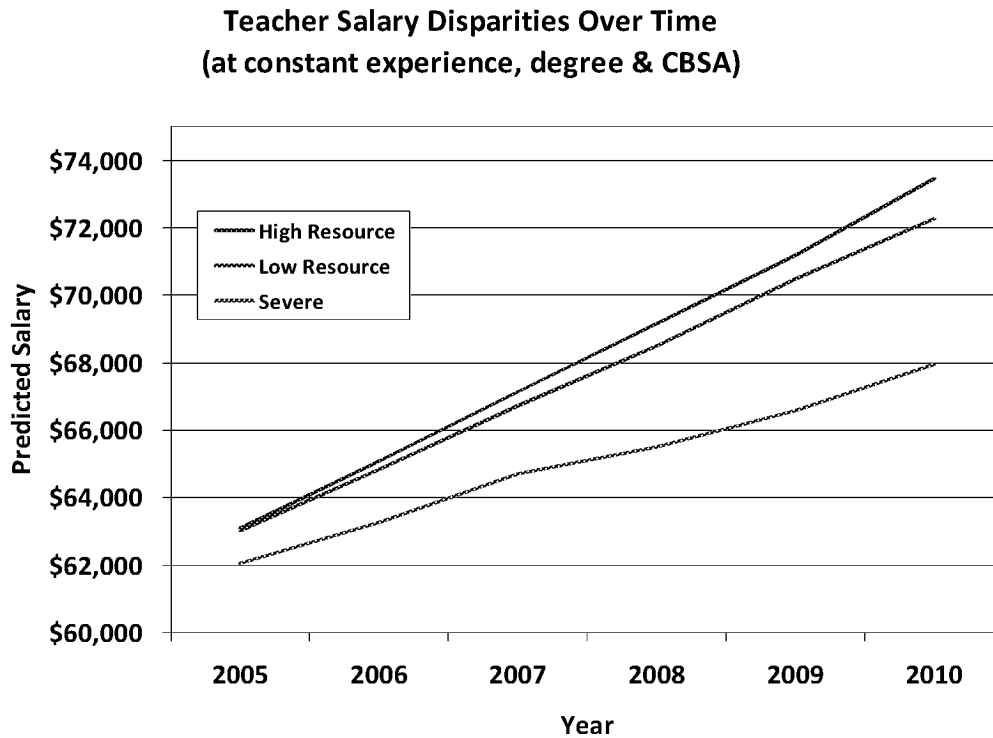


Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StaffExport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StaffExport.aspx)

We used another variation on the statistical model to project salaries for each group, for teachers with equated characteristics, in order to evaluate if teacher salaries in one group are falling further behind teacher salaries in another group over time. In this case, we interact the district group with the year variable in order to allow for the possibility that teacher salary disparities may be different in different years. Results from these regressions help to evaluate whether teacher salaries in severe disparity districts are catching up or falling even further behind.

Figure 3.6 shows that both teachers in the low spending/low outcomes group as a whole and in the severe disparity group in particular, are falling further behind teacher salaries in the high spending/high outcome group (in the same labor market). The growth in the salary gap between teachers in severe disparity districts and those in high resource districts is particularly disconcerting having grown from a difference of \$1,054, or 1.7%, in 2005 to a difference of \$5,517, or 8.1%, in 2010.

**Figure 3.6 – Salary Disparities over Time**



Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StaffExport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StaffExport.aspx)

Figures predicted for an individual with 5 to 9 years experience, a Master’s degree, and in CBSA 25540 (Hartford)

### Teacher Experience

A substantial body of literature has found that concentrations of novice teachers (i.e. teachers with less than 3 or 4 years of experience) can have significant negative effects on student outcomes.<sup>89</sup> Rivkin, Hanushek, and Kain (2005) find that teacher experience is important in the first two years of a teaching career (but not thereafter).<sup>90</sup> Hanushek and Rivkin note that: “we find that identifiable school factors – the rate of student turnover, the proportion of teachers

<sup>89</sup> See Charles T. Clotfelter, Helen F. Ladd and Jacob L. Vigdor, “Who Teaches Whom? Race and the distribution of novice teachers,” *Economics of Education Review* 24, no. 4 (August, 2005): 377-392; See Charles T. Clotfelter, Helen F. Ladd and Jacob L. Vigdor, “Teacher sorting, teacher shopping, and the assessment of teacher effectiveness,” Sanford Institute of Public Policy, Duke University, 2004; and Hanushek, Kain, and Rivkin, “Teachers, schools, and academic achievement.”

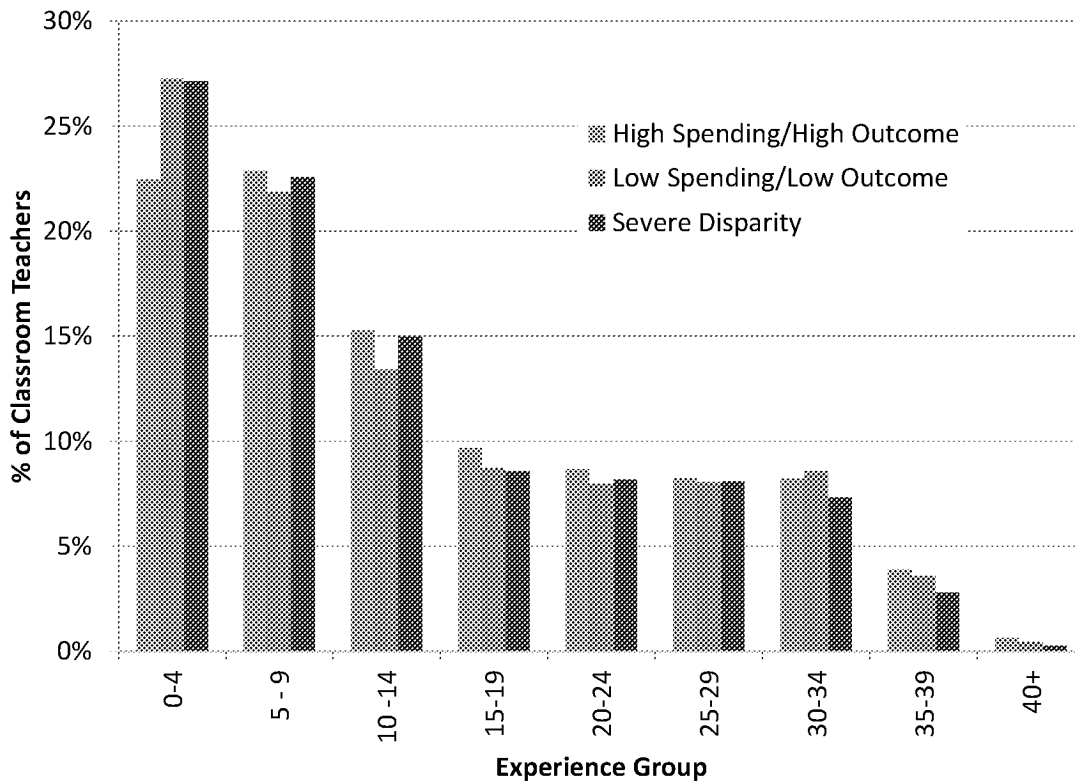
<sup>90</sup> Hanushek, Kain, and Rivkin, “Teachers, schools, and academic achievement.”

with little or no experience, and student racial composition – explain much of the growth in the achievement gap between grades 3 and 8 in Texas schools.”<sup>91</sup> Notably, evidence from a variety of state and local contexts, provides a consistent picture that higher concentrations of novice teachers are associated with negative effects on student outcomes.

Figure 3.7 shows that, compared to high spending/high outcome districts, low spending/low outcome districts including severe disparity districts have high shares of teachers in their first four years of experience. Districts in the low spending/low outcomes group generally have smaller shares of teachers in the 5 to 9 year and 10 to 14 year categories, whereas districts facing severe disparities have shortfalls of the most experienced teachers.

**Figure 3.7 – Teacher Experience**

**Teacher Experience Distribution by District Group**



Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StaffExport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StaffExport.aspx)

<sup>91</sup> <http://edpro.stanford.edu/hanushek/admin/pages/files/uploads/w12651.pdf>

Table 3.3 provides the estimates of a logistic regression model of the probability that a teacher is in his or her first three years of teaching, after correcting for other factors. The purpose of this analysis is to identify factors associated with, or predictors of, the likelihood that a teacher is a novice teacher. Figure 3.8 above indicates a greater share of novice teachers in low resource, low outcome district and in severe disparity districts than in high resource, high outcome districts. Unlike the chart above, the logistic regression models allows us to determine the relative probability that a teacher in a severe disparity district is a novice, compared a) in the same year, b) to other districts in the same labor market (metropolitan area), and c) whether those probabilities change over time. The results in Table 3.3 shows that on average:

1. Teachers working in the severe disparity group are 20% more likely to be “novice” teachers than teachers in all other districts.
2. Teachers in low spending/low outcomes districts are 19% more likely to be novice teachers than those in high spending/high outcomes districts.

**Table 3.3 - Estimates of the Odds that a Teacher is in Her First 3 Years**

<b>DV = Less than 3yrs Experience</b>		<b>Severe Disparity Group</b>			<b>High/Low Groups</b>		
<b>Independent Variables</b>		Odds Ratio	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z
<b>Need, Resource Category</b>							
	High Spending, High Outcomes						
	Low Spending, Low Outcomes				<b>1.19</b>	<b>0.04</b>	*
	Severe Disparity Group	<b>1.20</b>	<b>0.05</b>	*			
<b>Year</b>							
	2006	1.00	0.02		0.96	0.04	*
	2007	1.02	0.02		0.96	0.04	*
	2008	1.02	0.02		0.94	0.04	*
	2009	0.92	0.02	*	0.83	0.03	*
	2010	0.74	0.02	*	0.62	0.03	*
<b>Interaction Terms</b>							
Severe Disparity Group							
	Severe x 2006	1.04	0.06				
	Severe x 2007	0.87	0.05	*			
	Severe x 2008	0.95	0.06				
	Severe x 2009	0.83	0.05	*			
	Severe x 2010	0.92	0.06				
High Spending/Low Outcomes							
	HSLO x 2006				1.03	0.08	
	HSLO x 2007				1.05	0.08	
	HSLO x 2008				1.06	0.08	
	HSLO x 2009				1.03	0.08	
	HSLO x 2010				1.13	0.09	
Low Spending/High Outcomes							
	LSHO x 2006				1.07	0.09	
	LSHO x 2007				1.15	0.10	
	LSHO x 2008				1.13	0.10	
	LSHO x 2009				1.24	0.11	*
	LSHO x 2010				1.28	0.12	*
Low Spending/Low Outcomes							
	LSLO x 2006				1.07	0.05	
	LSLO x 2007				1.06	0.05	
	LSLO x 2008				1.14	0.06	*
	LSLO x 2009				1.11	0.06	*
	LSLO x 2010				1.21	0.06	*
<b>Core Based Statistical Area</b>							
	Bridgeport-Stamford						
	Hartford-West Hartford	1.01	0.02		1.03	0.02	
	New Haven-Milford, CT	1.20	0.02	*	1.18	0.02	**
	Norwich-New London, CT	0.75	0.02	*	0.75	0.02	*
	Torrington, CT	0.91	0.03	*	1.10	0.05	*
	Willimantic, CT	0.89	0.03	*	0.99	0.05	*

\*p<.05, \*\*p<.10

Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StaffExport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StaffExport.aspx)

## Curricular Depth, Breadth and Access

When districts serving high need and underperforming populations are faced with resource constraints, they may be forced to divert resources from enrichment programs to programs targeted at raising progress towards minimum standards in core content areas. Although reasonable and appropriate under the circumstances, such choices can serve to deprive students in these districts of important opportunities. If high need districts were afforded sufficient resources, they could both target necessary resources toward remedial and basic programming and continue to offer challenging as well as broad and enriched curricula. Such curricular opportunities are not merely frills. Access to advanced and enriched curricula is a significant equal opportunity concern, affecting access to and potential success in college and beyond.

The opportunity to participate in important milestone courses such as algebra or geometry as well as more advanced and enriched academic coursework is associated with college acceptance, matriculation and ultimately personal financial success after college. For example, Rose and Betts note:

“Our results suggest that a curriculum that includes algebra and geometry is systematically related to higher earnings for graduates a decade after graduation.”<sup>92</sup>

Betts and Rose further explain that:

“...the math curriculum can explain nearly one-quarter of the gap between students with parental income in the lowest and middle groups. This latter finding is important because it suggests a tool—namely the math curriculum—for increasing the degree of equity in students’ earnings opportunities later in life.”<sup>93</sup>

Others point to the importance of early access to algebra specifically in order to put students on a trajectory to succeed in non-remedial, credit bearing math courses during their freshman and sophomore years in college.<sup>94</sup>

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<sup>92</sup> Heather Rose and Julian R. Betts, “The Effect of High School Courses on Earnings,” *Review of Economics and Statistics* 86, no. 2 (Month, 2004): 497–513, p. 510.

<sup>93</sup> *Ibid.*, p. 510.

<sup>94</sup> Adam Gamoran and Eileen C Hannigan, “Algebra for Everyone? Benefits of College-Preparatory Mathematics for Students With Diverse Abilities in Early Secondary School,” *Educational Evaluation and Policy Analysis* 22, no. 3 (Fall, 2000): 241-254.

Killgore explains the importance of high school students' academic and non-academic qualifications for acceptance to selective colleges. With regard to non-academic merit, Killgore explains:

Nonacademic merit becomes important to admissions officers at elite colleges because it offers them additional criteria to distinguish the best from among their large pool of applicants who are highly qualified in academic terms. Nonacademic merit consists of extracurricular involvement, such as sports, artistic activities, student organizations, and volunteerism. By emphasizing the importance of developing both types of merit prior to entering college, elite colleges further prepare their students to engage in the adult world as effective professionals, citizens, and as members of the power elite.<sup>95</sup>

Long, Iatarola and Conger find:

Using data on students in Florida public postsecondary institutions, we find that differences among college-going students in the highest math course taken explain 28–35 percent of black, Hispanic, and poverty gaps in readiness and over three-quarters of the Asian advantage.<sup>96</sup>

Expecting public school districts serving higher need student populations to limit or eliminate entirely activities not associated with improving minimum outcomes in reading and math alone significantly disadvantages high school graduates wishing to compete for admissions to selective colleges or to progress through credit-bearing courses in college.

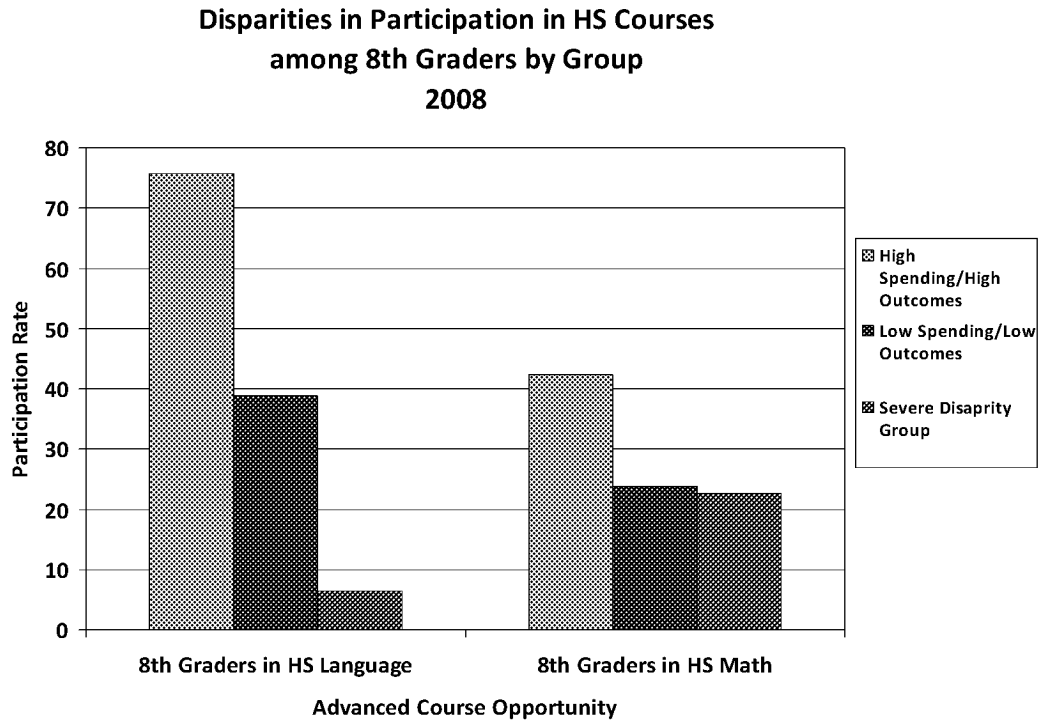
Figure 3.8 presents the percent of 8<sup>th</sup> grade students in each group of districts who participate in high school level course offerings in languages or in math. Far fewer students in low spending, low outcome districts participate in high school language classes than do students in high spending, high outcome districts. And fewer than 10% of children attending severe disparity districts participate in high school language courses. Access to high school math courses is particularly important for placing students on track to take advanced high school math courses which are associated with college persistence. But only about half as many students attending severe disparity districts, compared to those attending high resource, high outcome districts participate in high school level math courses.

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<sup>95</sup>Leslie Killgore, "Merit and Competition in Selective College Admissions," *The Review of Higher Education* 32, no. 4 (Summer 2009): 469–488, p. 471.

<sup>96</sup>Mark C. Long, Patrice Iatarola, and Dylan Conger, "Explaining Gaps in Readiness for College-Level Math: The Role of High School Courses" *Education Finance and Policy* 4, no. 1 (Winter 2009): 1-33.

**Figure 3.8 – Advanced Courses for 8<sup>th</sup> Graders**



Some authors have suggested that high need districts allocate too many resources and too much time to activities other than core instruction in math and reading. These assertions are based largely on anecdotes from a small number of selected, unnamed locations.<sup>97</sup> Figure 3.9, however, shows that in Connecticut, 5<sup>th</sup> grade students attending low spending, low outcomes districts or the severe disparity subset of those districts are provided less time in Art, Physical Education or Music than their peers attending high spending, high outcome districts.

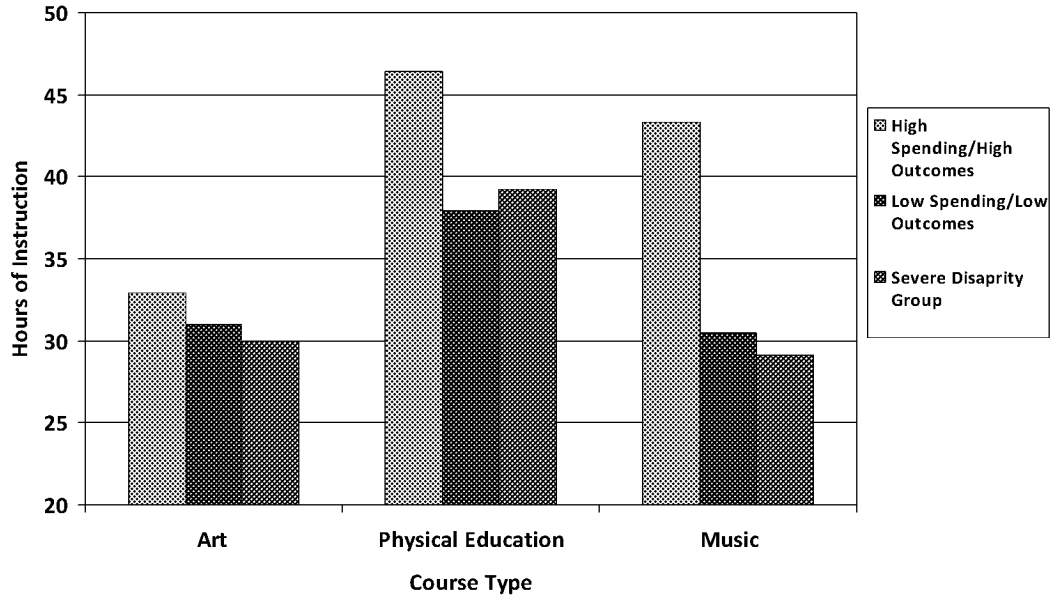
By contrast, Figure 3.10 below shows that low resource, low outcome districts do attempt to target additional resources (time) to reading and math. That is, higher need, resource constrained districts are allocating more time to reading and at least as much time to math, but at the expense of time for a more well-rounded curriculum, like that available to children in high resource, high outcome districts.

<sup>97</sup> For a discussion of the research on this topic, see: Bruce D. Baker, “Cheerleading, Ceramics and the Non-Productive Use of Educational Resources in High Need Districts: Really?” Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA, 2011  
[http://schoolfinance101.files.wordpress.com/2010/01/b-baker-mo\\_il-resourcealloc-aera2011.pdf](http://schoolfinance101.files.wordpress.com/2010/01/b-baker-mo_il-resourcealloc-aera2011.pdf)

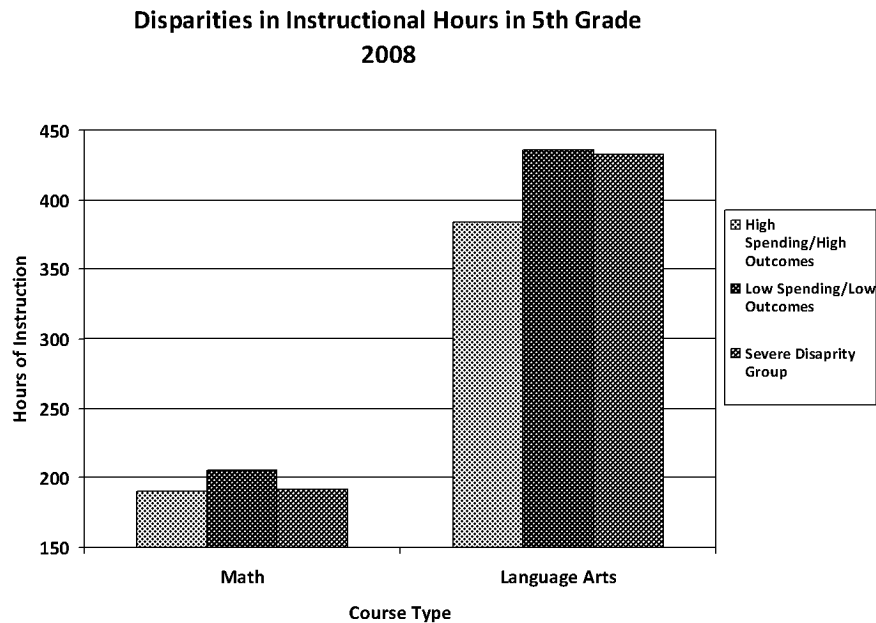


**Figure 3.9 – Instructional Hours in Co-curricular Courses**

**Disparities in Instructional Hours in 5th Grade  
2008**



**Figure 3.10 – Instructional Hours in Core Academic Courses**



**Staff Assignments**

Table 3.4 uses 6 years of data on all certified staffing assignments across all districts in each group to examine the internal allocation of resources across the three groups of districts. Staffing assignments are expressed as a percent of all staffing assignments, in order to determine where each group of districts tends to allocate larger or smaller shares of staff. The ratios in the last two columns of Table 3.4 reveal the imbalance in resource allocation between high spending, high outcome districts and low spending, low outcome districts and severe disparity districts.

Staffing assignments are sorted from the largest to smallest ratios of high spending, high outcome district allocations to severe disparity district allocations. Larger ratios indicate the high spending, high outcome districts devote a higher proportion of their staff to an assignment. For example, high resource, high outcome districts allocated 2.74 times the share of their staff to band, as do low resource, low outcomes districts. High resource, high outcome districts allocated nearly 6 times the share of their staff to band as do severe disparity districts. Focusing on the large disparities between high resource, high outcome districts and severe disparity districts, the high resource, high outcome districts have greater than double the share of staff allocated to band, French, World History, Spanish, American History, Gifted and Talented Programs, and Librarians. Low resource, low outcome and specifically severe disparity districts provide much greater shares of teachers of English as a Second Language, and to pre-kindergarten, as one might expect given that these districts serve larger shares of limited English proficient students and research evidence suggests the importance of early childhood programs for children from

economically disadvantaged backgrounds. These high need districts also have greater shares allocated to literacy content coaching, social work and kindergarten (despite having slightly larger Kindergarten class sizes).<sup>98</sup>

Perhaps the biggest resource constraint for high need districts relates to their additional allocation of teachers to elementary classrooms. Elementary classroom teachers represent the largest share of teachers in most school districts and in particular in the low resource, low outcome districts here. This occurs in part because a relatively high proportion of total enrollment is in the elementary grades in high need districts. As more classroom teachers are needed at the elementary level, pressure is placed on staffing for smaller and/or discretionary programs at the middle and secondary levels. Recall that on average, severe disparity districts have been unable to accomplish class size reduction in early grades, despite allocating larger shares of their overall staffing to elementary grades.

In turn, curricular areas that suffer in particular include the arts, world history, gifted and talented programs, foreign languages, physical sciences and support staff including librarians. There exists nearly a 6:1 ratio of band instructors in high resource, high outcome districts to those in severe disparity districts (as a proportion of total staff). That is, children attending low resource, low outcome districts appear to have relatively limited access to staff assigned to instrumental music. This finding is consistent with the earlier finding of fewer contact hours in music (generally) for children in these same districts. There exists greater than 2:1 ratio of staff for gifted and talented programs and librarians in high resource, high outcome districts compared to severe disparity districts and a nearly 2:1 ratio of chemistry teachers.

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<sup>98</sup> The apparent contrast between this finding that high need districts have larger shares of teaches at the kindergarten level and the earlier finding of larger kindergarten class sizes, may occur for a number of reasons. First, these districts may simply have larger shares of their overall enrollments at the kindergarten level leading to greater staffing at that level even if class sizes remain large. Second, these districts may be resource constrained to the extent that while they allocate a larger share of their staff to kindergarten, even that larger share of total staff is insufficient to reduce kindergarten class sizes.

**Table 3.4 - Disparities in the Shares of Staff Allocated to Specific Courses/Positions/Assignments**

Staff Assignment	High Spending/ High Outcomes	Low Spending/ Low Outcomes	Severe Disparity	High to Low Ratio	High to Severe Ratio
<b>Band</b>	0.9%	0.3%	0.2%	2.74	5.73
<b>French</b>	1.1%	0.4%	0.3%	2.51	4.30
<b>World History</b>	0.5%	0.3%	0.2%	1.56	3.26
<b>Spanish</b>	3.5%	1.7%	1.1%	2.01	3.01
<b>American History</b>	0.6%	0.4%	0.2%	1.52	2.95
<b>Gifted and Talented</b>	0.6%	0.3%	0.2%	1.83	2.34
<b>Librarian</b>	0.6%	0.3%	0.3%	2.48	2.09
<b>Reading and Language</b>	0.7%	0.4%	0.4%	1.70	1.96
<b>Computer Education/IT</b>	0.6%	0.4%	0.3%	1.33	1.84
<b>Chemistry</b>	1.0%	0.6%	0.5%	1.65	1.83
<b>Health</b>	0.8%	0.5%	0.4%	1.42	1.71
<b>English</b>	7.0%	6.3%	5.4%	1.11	1.30
<b>Physical Education</b>	3.8%	3.4%	3.0%	1.13	1.29
<b>School Counselor/Guidance</b>	2.9%	2.4%	2.3%	1.22	1.27
<b>Speech &amp; Language Pathology</b>	2.3%	1.8%	1.8%	1.29	1.25
<b>Biology</b>	1.7%	1.5%	1.4%	1.12	1.25
<b>Mathematics</b>	6.1%	5.4%	5.0%	1.13	1.22
<b>Reading: Remedial</b>	1.2%	1.0%	1.0%	1.27	1.20
<b>School Psychologist</b>	1.9%	1.4%	1.6%	1.29	1.18
<b>Media Specialist</b>	1.1%	1.1%	0.9%	0.97	1.15
<b>Art</b>	2.8%	2.7%	2.5%	1.06	1.15
<b>Social Studies</b>	4.4%	4.1%	4.2%	1.06	1.05
<b>Principal</b>	1.8%	2.0%	1.8%	0.87	0.96
<b>General Music</b>	1.9%	2.2%	2.0%	0.85	0.95
<b>Consumer Science/Life</b>	0.8%	0.7%	0.8%	1.19	0.95
<b>General Science</b>	2.1%	2.2%	2.2%	0.96	0.93
<b>Assistant or Vice Principal</b>	1.4%	1.7%	1.6%	0.86	0.92
<b>Elementary Teacher</b>	21.6%	23.6%	24.6%	0.92	0.88
<b>Technology Education</b>	1.3%	1.2%	1.6%	1.08	0.80
<b>Special Education: Grades 1-12</b>	8.8%	10.0%	11.1%	0.88	0.79
<b>Special Education: Pre-k</b>	0.8%	0.8%	1.1%	0.93	0.74
<b>Kindergarten</b>	3.0%	4.0%	4.5%	0.74	0.66
<b>School Social Worker</b>	1.0%	1.7%	1.5%	0.59	0.66
<b>Business &amp; Financial</b>	0.7%	1.1%	1.2%	0.67	0.64
<b>Subject Area Supervision</b>	0.4%	0.7%	0.9%	0.52	0.42
<b>Content Coach: Literacy</b>	0.3%	1.0%	0.9%	0.27	0.31
<b>Reading: Non-Remedial</b>	0.6%	1.4%	2.1%	0.42	0.29
<b>TESOL</b>	0.4%	1.4%	1.8%	0.26	0.21
<b>Pre-Kindergarten</b>	0.1%	0.8%	1.0%	0.11	0.09

Data Source: [http://sdeportal.ct.gov/Cedar/WEB/ct\\_report/StaffExport.aspx](http://sdeportal.ct.gov/Cedar/WEB/ct_report/StaffExport.aspx)

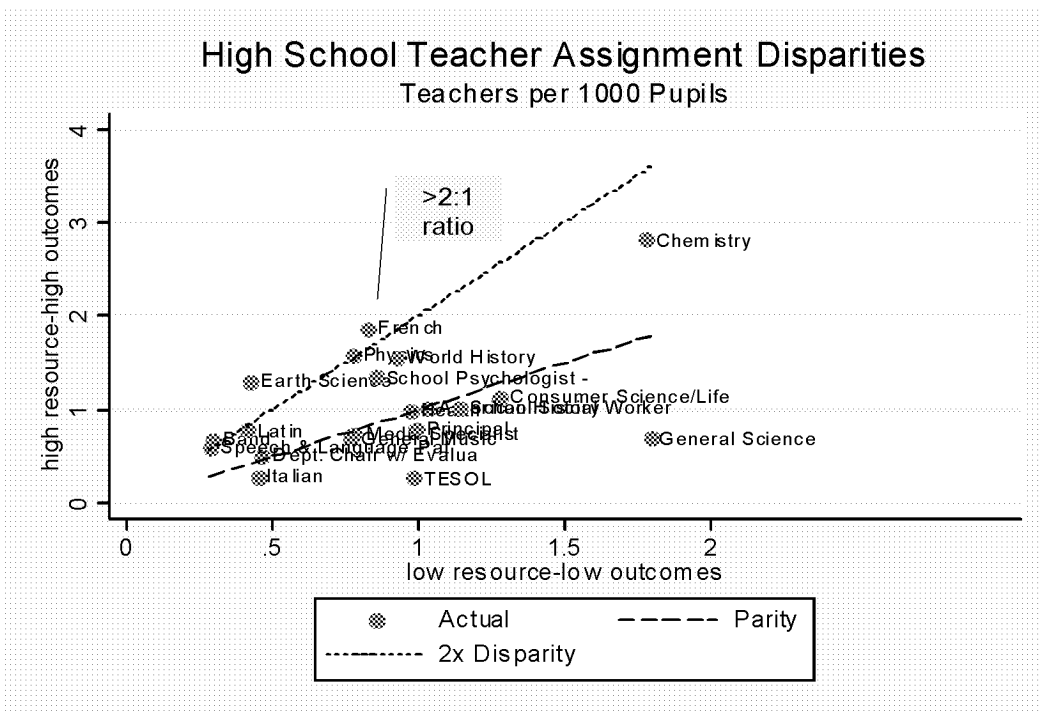
The next several figures explore disparities across specific teacher assignments with respect to student enrollments. Here, we focus specifically on the contrast between high resource, high outcome districts and low resource, low outcomes districts. We take the total number of teachers assigned to each assignment category and express that number per 1,000 students in the relevant grade levels across schools in the group.

Each figure graphs the numbers of staffing assignments per 1,000 pupils for low resource, low outcomes districts across the horizontal axis and for high resource, high outcomes districts along the vertical axis. If resources were comparable across both sets of schools, each position would fall along a 45 degree diagonal line. That is, if there was 1 French Teacher per 1,000 pupils in low resource, low outcome districts and the same in high resource, high outcome districts, that point would lie at 1:1. The dashed (lower) line on each graph represents this type of parity. Assignments that appear above the dashed, lower diagonal line are more abundant in high resource, high outcome districts than in low resource, low outcome districts. Assignments that appear below the dashed line are more abundant in low resource, low outcome districts. The dotted, steeper angled line indicates the threshold at which high resource high outcome districts have double the resources of the low resource, low outcome district, or a 2:1 ratio.

Figure 3.11 focuses on the assignments that are generally less abundant, i.e., those with fewer than 3 teachers per 1,000 students regardless of the type of district. It shows that general science and Teachers of English to Speakers of Second Languages (TESOL) assignments are more common in low resource, low outcome districts. Many assignments, including principals, Italian or consumer and life sciences are near parity between the two groups. But chemistry and physics, along with French, Latin and earth science are each far more common in high resource, high outcome districts than in low resource, low outcome districts.

Figure 3.12 displays the disparities across more common staffing assignments. Overall, there is greater parity across the more common assignment areas including English and Mathematics, and even physical education and art, than across the more specialized assignments included in Figure 3.11.

**Figure 3.11 - High School Teacher Assignments**



**Figure 3.12 - High School Teacher Assignments (cont'd)**

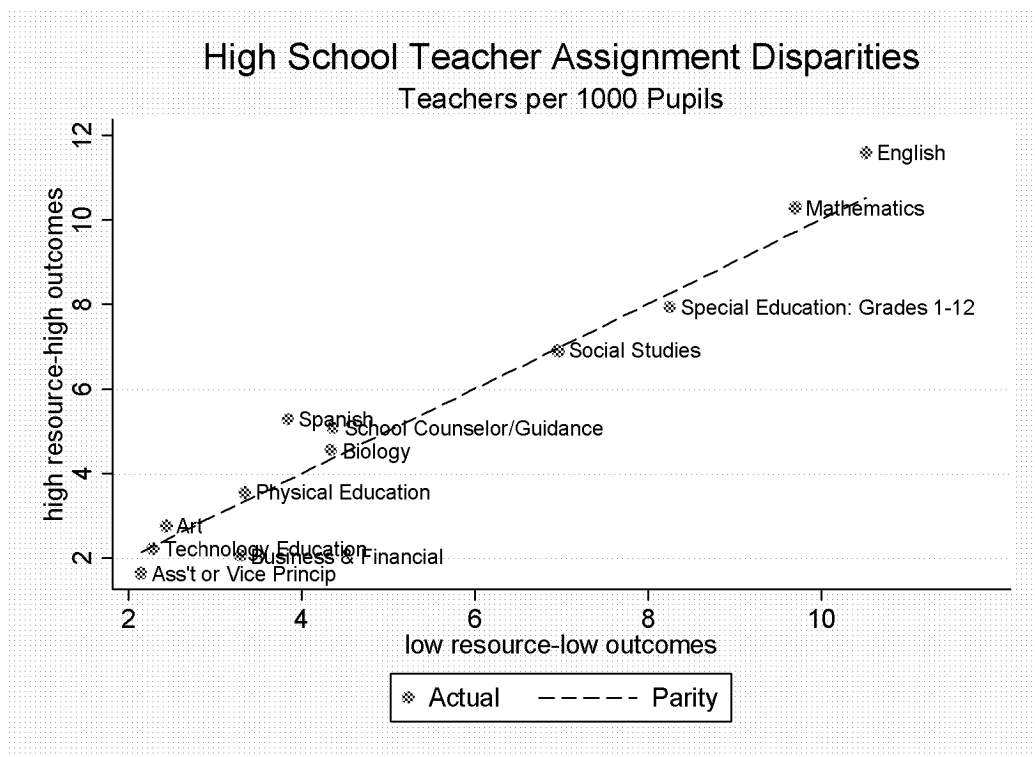
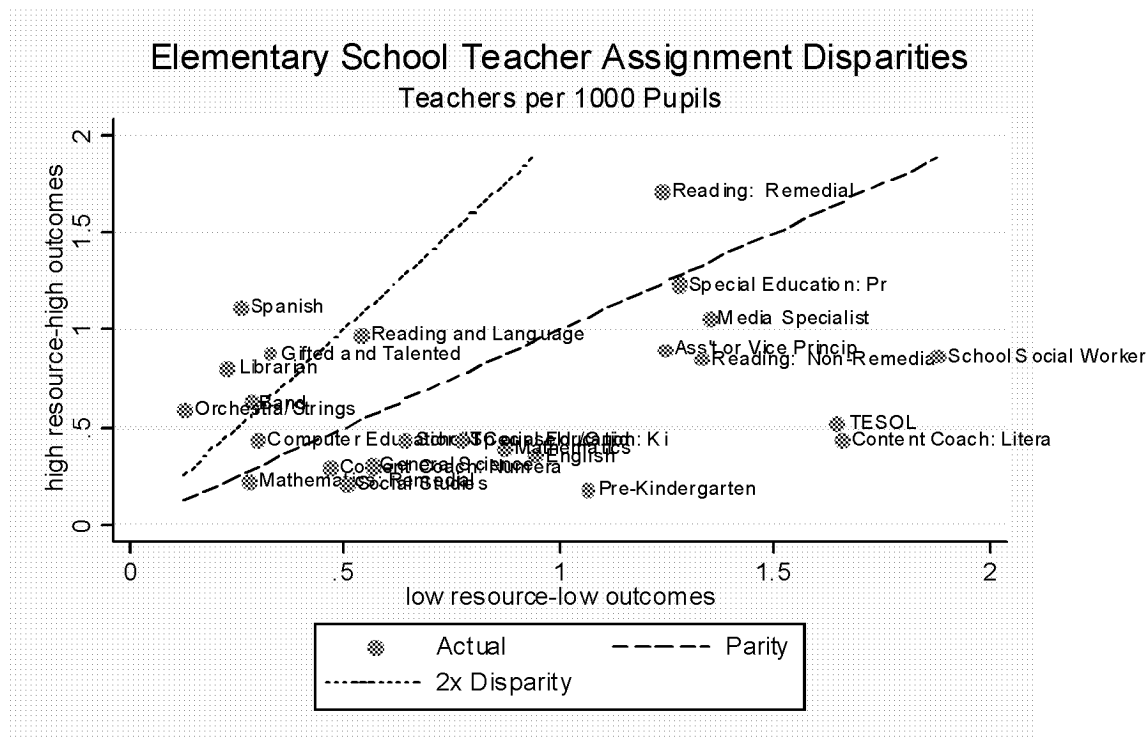


Figure 3.13 explores disparities in staffing allocations across elementary students. At the elementary level, low resource, low outcome districts have allocated considerable additional resources to pre-kindergarten, TESOL, literacy content coaching, social work and “reading-non-remedial.” By contrast, high resource, high outcome districts have allocated more than double the ratios in Orchestra, Gifted and Talented, and Band. High resource, high outcome districts have also allocated more resources to Spanish and reading and language.

**Figure 3.13 – Elementary School Teacher Assignments**



Among the more prevalent assignments in elementary schools, included in Figure 3.14, low resource, low outcome districts have slightly greater ratios of elementary classroom teachers. Given the constrained resources in these districts, even this slight shift to increase staffing to elementary classrooms may be leading to reductions in staffing for other programs such as gifted and talented, band or orchestra.

**Figure 3.14 – Elementary School Teacher Assignments (cont'd)**

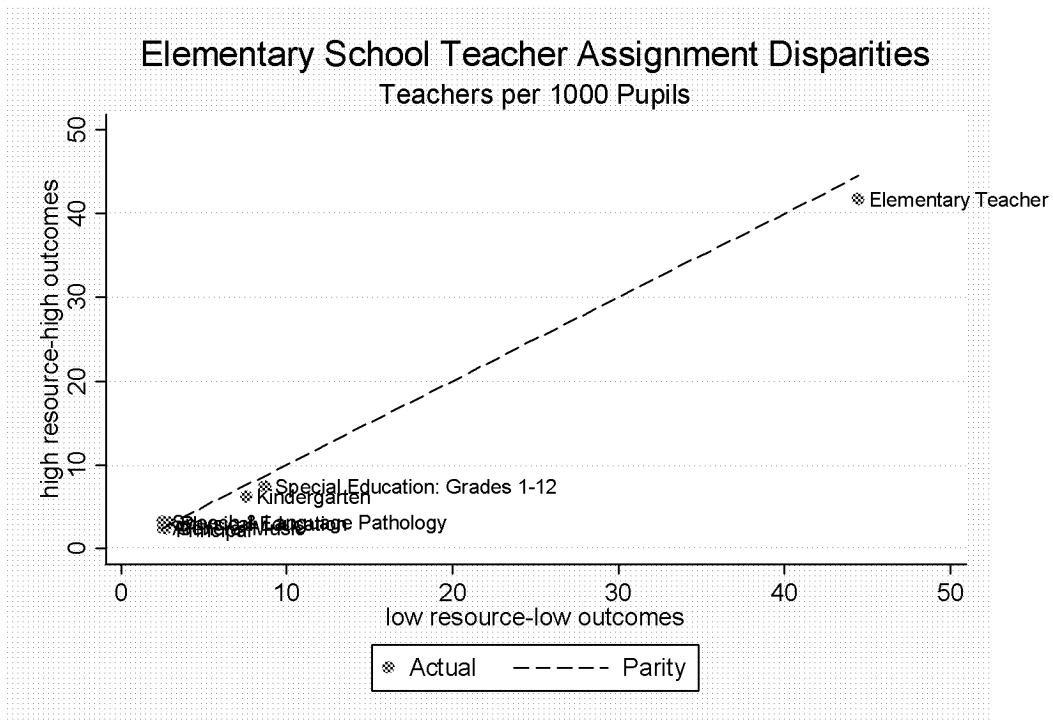
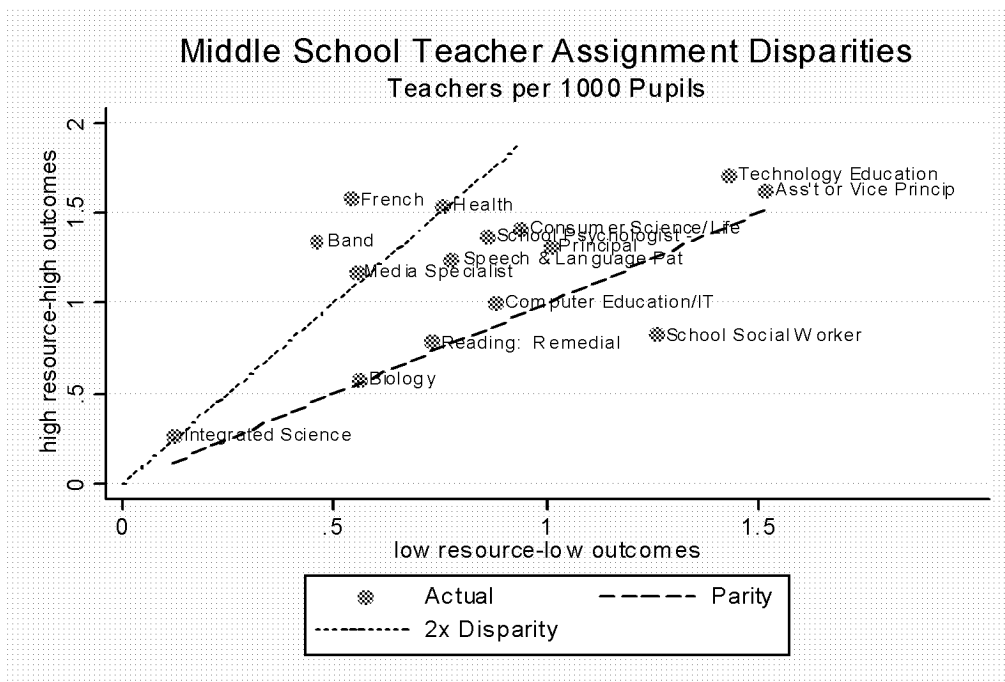


Figure 3.15 shows disparities across less abundant curricular opportunities at the middle school level. At the middle school level, among those assignment areas generally less common, low resource, low outcome districts have fewer of most assignments, except social workers. There exists relative parity – comparable numbers per child – for biology, remedial reading and computer education, as well as assistant principals. But, middle school students attending low resource, low outcome districts have much less access to band and French in particular. Overall, high resource, high outcome middle schools have far more teacher assignments per child.

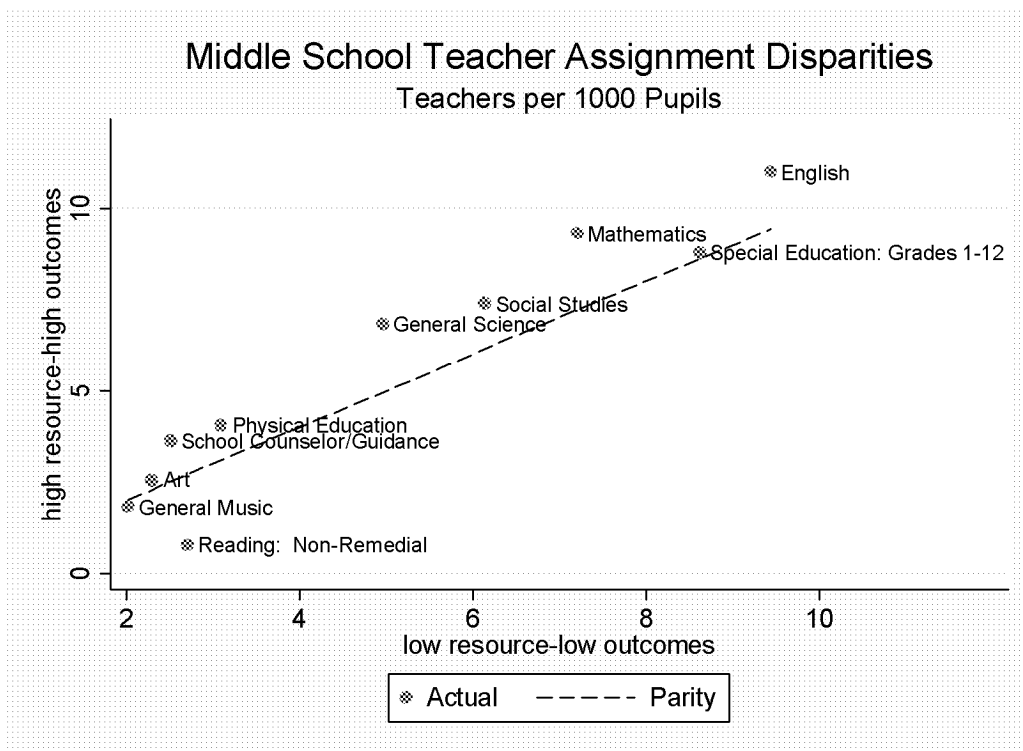
Across the more prevalent assignments for middle school teachers, included in Figure 3.16, low resource, low outcome districts have fewer English, Math, Social Studies and General Science teachers, but more reading teachers, per middle school child than do high resource, high outcome school districts.



**Figure 3.15 – Middle School Teacher Assignments**



**Figure 3.16 – Middle School Teacher Assignments (cont'd)**



## **Addendum: Evaluating the Distribution of State Categorical Aids in Connecticut**

In the main body of our report, “Evaluating Connecticut’s Education Cost Sharing Program, School Funding and Educational Resources,” we evaluate a) the design of the Education Cost Sharing program and b) the distribution of resources across districts. In our analysis of the distribution of net current expenditures, we show the total operating spending, financed by funding from all sources, is much lower relative to district costs and student needs in high poverty districts than in wealthy districts. These disparities result from differences between high wealth and high poverty districts in their ability to raise local revenues together with features a state aid programs administered by the state. In our report, we focus specifically on the ECS program, which is by far the largest state aid program for schools. A main finding is that the ECS program does not provide sufficient support to high need districts, resulting in very small increases in funding per pupil for districts with high levels of student need.

In addition to the ECS program, the state administers a number of categorical aid programs that provide funding to support operating spending by school districts. In this addendum we provide analyses of the distribution of the largest of these other school aid programs. Our analysis highlights the following:

- Categorical grants play a relatively small role in funding operating expenditures by local school districts. In 2009-2010, ECS funding equaled 21% of total net current operating expenditures across all Connecticut schools districts, and all other categorical grants combined accounted for only 15% of net current operating expenditures, but only 7.3% after excluding building aid and charter aid. No single categorical grant program equals more than 2% of net current operating expenditures.<sup>99</sup>
- Three of the largest categorical grant programs—the priority need district program, the school readiness-severe need program, and the magnet school program—each tend to provide larger amounts of funding to higher poverty districts, and thus, help to ameliorate spending disparities. However, the funding provided by these programs is small, about 3.6% (combined) of net current expenditures, and thus, these programs are far short of what is needed to substantially reduce the resource disparities documented in our main report.
- Another of the largest, categorical grant programs—the special education excess cost program—on average, tends to send larger amounts of aid to low poverty districts than

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<sup>99</sup> We exclude from this calculation the School Building Projects aid program. Although this program is the largest school aid program other than the ECS formula, it funds capital expenditures. Our analysis is focused on programs that support current operating expenditures.

high poverty district, offsetting some of the effects of the other large categorical aid programs.

- Magnet school funding differs dramatically across different high poverty districts. Thus, magnet school funding plays a significant role in explaining the finding in our report that Bridgeport and New Britain have larger EEO spending gaps than Hartford and New Haven.

### **Funding from Categorical Aid Programs**

Table 1 below shows the average distribution in 2010 of aid per student in average daily membership (using 2008 ADM) for state categorical aid programs, and including ECS aid at the top. All districts receive ECS aid, with the average ECS aid per ADM, weighted by district ADM, at about \$2,895 per pupil, which is about 21% of net expenditures. Most categorical aid programs are only a fraction of ECS aid. In total, categorical aid programs that support current operating expenditures by school districts, which does not include School Building Projects Aid used to support capital spending or Charter School aid, amounts to \$996 per pupil, which is equal to 7.3% of net current expenditures.

**Table 1: Categorical Aids by Weighted Mean Allocation**

<b>State Grant Name</b>	<b>Mean per ADM</b>	<b>Std. Dev.</b>	<b>Total Districts</b>
Education Cost Sharing	\$2,892	\$2,138	169
School Building Projects	\$858	\$1,406	143
Priority School District	\$242	\$79	15
School Readiness -Severe Need	\$226	\$183	62
Magnet School	\$198	\$436	82
Sp. Ed. - Excess Cost	\$138	\$87	152
Sp. Ed. - State Agency	\$85	\$67	116
Transportation - Public	\$51	\$39	164
Vocational Agriculture	\$42	\$51	19
Adult Education - Pro	\$36	\$53	145
Sp.Ed Excs Cost Students	\$34	\$26	166
Open Choice Program	\$22	\$21	52
School Accountability	\$21	\$0	15
Head Start	\$20	\$5	2
Family Resource Center	\$20	\$10	33
Sheff Settlement	\$19	\$28	25
Extended School Hours	\$19	\$0	14
Interdistrict Cooperative	\$17	\$14	21
After School Program	\$16	\$15	19
Nonpublic Health Services	\$12	\$12	71
Transportation-Nonpublic	\$11	\$9	62
Healthy Foods Grant	\$10	\$3	91
Bilingual Education	\$9	\$6	24
Youth Service Bureau	\$7	\$5	93
Head Start Link	\$7	\$0	2
Primary Mental Health	\$5	\$5	17
State School Breakfast	\$5	\$3	43
Child Nutrition State	\$4	\$2	152
Young Parents Program	\$2	\$3	6

**Table 2: Categorical Aids and ECS by % of Total**

Grant Name	2010 Payments	% of Categorical Aid	% of Non-Building Categorical Aid	% of NCE
Total NCE 2009-10 [1]	\$7,575,014,350			
Education Cost Sharing Grant	\$1,614,423,872	58.6%		
School Building Projects	\$536,772,072	47.1%		
Magnet School	\$155,032,910	13.6%	25.7%	2.0%
Sp. Ed. - Excess Cost	\$77,343,940	6.8%	12.8%	1.0%
School Readiness -Severe Need	\$73,976,003	6.5%	12.3%	1.0%
Charter Schools	\$48,081,000	4.2%	8.0%	0.6%
Sp. Ed. - State Agency Placements	\$43,161,177	3.8%	7.2%	0.6%
Priority School Districts	\$40,929,547	3.6%	6.8%	0.5%
Transportation - Public	\$28,728,720	2.5%	4.8%	0.4%
Adult Education - Provider	\$19,564,652	1.7%	3.2%	0.3%
Sp.Ed Excs Cost Student Supplmnt	\$19,316,240	1.7%	3.2%	0.3%
Interdistrict Cooperative	\$13,989,781	1.2%	2.3%	0.2%
Open Choice Program	\$13,167,012	1.2%	2.2%	0.2%
American School For The Deaf	\$9,480,242	0.8%	1.6%	0.1%
Family Resource Center Program	\$5,739,238	0.5%	1.0%	0.1%
After School Program	\$4,776,326	0.4%	0.8%	0.1%
Nonpublic Health Services	\$4,755,000	0.4%	0.8%	0.1%
Vocational Agriculture	\$4,560,565	0.4%	0.8%	0.1%
Head Start	\$4,295,091	0.4%	0.7%	0.1%
Interdist Magnet Schl Cap Start-Up	\$4,050,000	0.4%	0.7%	0.1%
Transportation-Nonpublic	\$3,995,000	0.4%	0.7%	0.1%
Youth Service Bureau	\$3,507,790	0.3%	0.6%	0.0%
School Accountability-Summer Schl	\$3,499,699	0.3%	0.6%	0.0%
Healthy Foods Grant	\$3,479,574	0.3%	0.6%	0.0%
Extended School Hours	\$2,994,752	0.3%	0.5%	0.0%
Child Nutrition State Match	\$2,354,633	0.2%	0.4%	0.0%
Bilingual Education	\$2,113,153	0.2%	0.4%	0.0%
Head Start Link	\$2,090,000	0.2%	0.3%	0.0%
Sheff Settlement	\$2,057,819	0.2%	0.3%	0.0%
State School Breakfast	\$1,611,349	0.1%	0.3%	0.0%
Regional Education Service Centers	\$1,453,500	0.1%	0.2%	0.0%
State Accountability Funds	\$920,000	0.1%	0.2%	0.0%
Other State Grants	\$734,920	0.1%	0.1%	0.0%
Special Ed. - DMH	\$723,910	0.1%	0.1%	0.0%
Primary Mental Health	\$409,325	0.0%	0.1%	0.0%
School To Career Opportunities	\$213,750	0.0%	0.0%	0.0%
Young Parents Program	\$165,394	0.0%	0.0%	0.0%
Readers As Leaders	\$57,000	0.0%	0.0%	0.0%
Ct Writing Project	\$47,500	0.0%	0.0%	0.0%

[1] see: <http://www.sde.ct.gov/sde/lib/sde/PDF/dgm/report1/basiccon.pdf>

### Distribution of Categorical Aid Programs

The next several figures explore the distributional effects of the major categorical aid programs that support district operating expenditures. Figure 1 shows the distribution of total non-ECS categorical aids by districts arranged according to the percent of children qualified for

free or reduced price lunch. Figure 1 excludes building aid and charter school aid, focusing on those aid programs which provide primarily support for operating spending by districts.

Figure 1 shows that, on average, districts with higher concentrations of children qualified for free or reduced price lunch do receive more categorical aid, with Bridgeport receiving approximately \$1,200 per pupil in cumulative categorical aids and falling generally along the trend. But, while Bridgeport and Waterbury receive under \$2,000 per pupil in cumulative categorical aids, Hartford and New Haven receive closer to \$3,000 per pupil explaining a large share of the discrepancy between these districts that we discussed in the body of the report (pages 57 to 58).

**Figure 1: Non-ECS Grants Total Excluding Building Projects & Charter Aid**

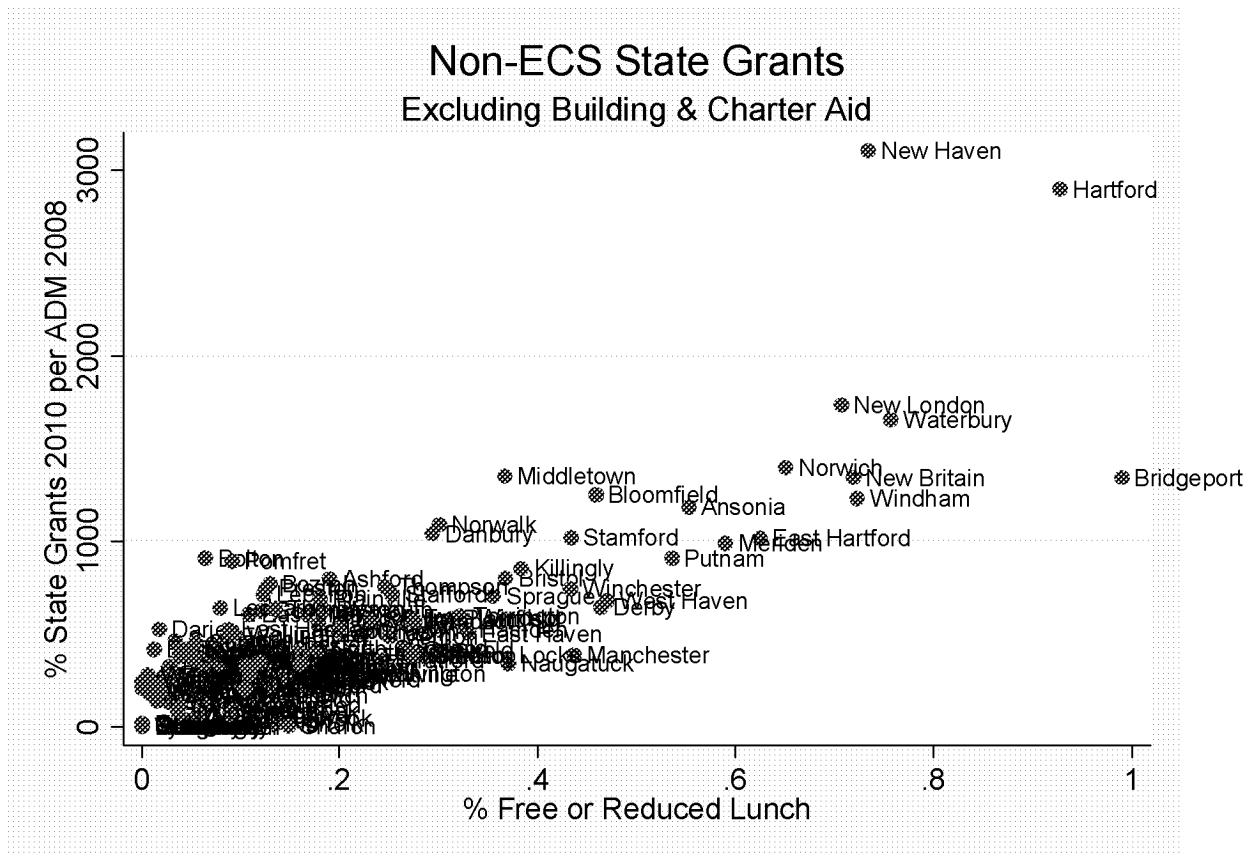


Figure 2 shows the distribution of priority school district aid. The districts that we identify in the body of the report as the most severely deprived districts in the state do receive priority school district aid. Thus, this aid program does help to reduce the Equal Educational Opportunity (EEO) and Adequacy gaps reported in the body of our report. Note, however, that our estimates of the EEO and Adequacy gaps include expenditures of priority school district aid in 2008.<sup>100</sup> This aid, while targeted to high need districts, is quite small, and thus, is insufficient for closing the gaps toward providing either equal opportunity or educational adequacy.

**Figure 2: Priority School District Aid**

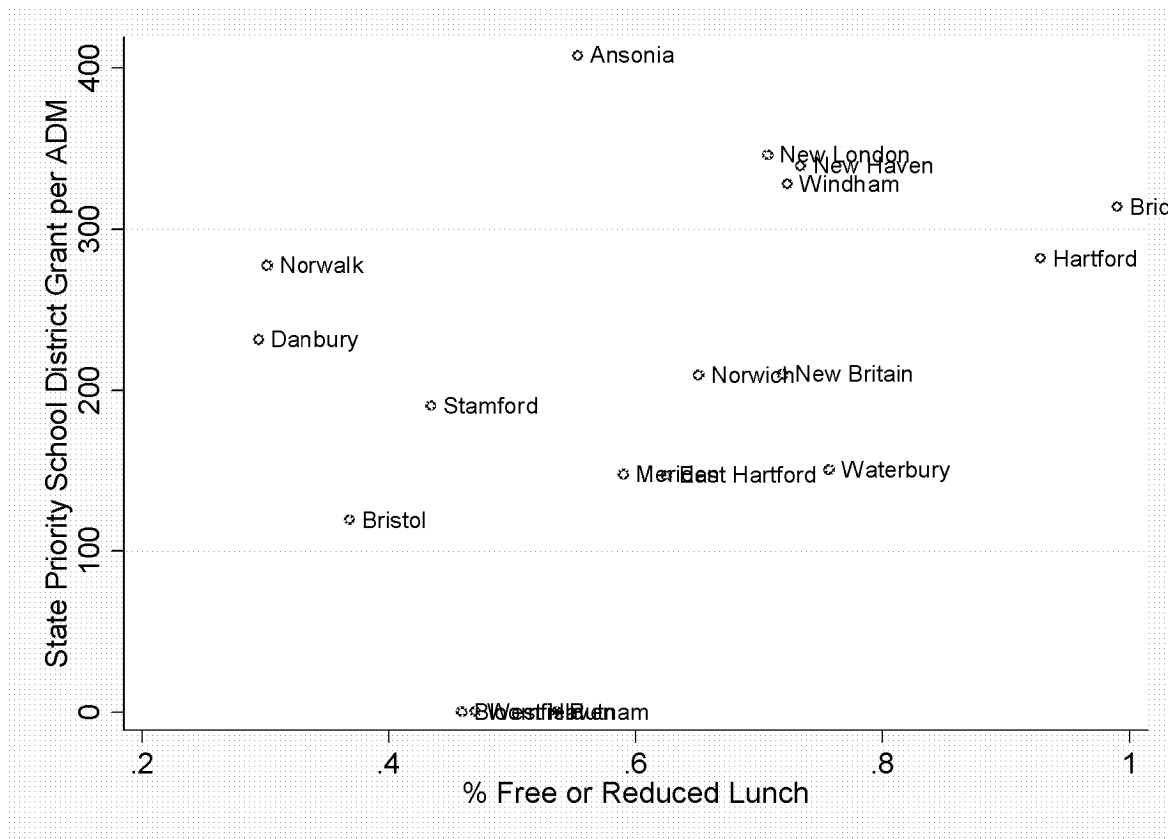
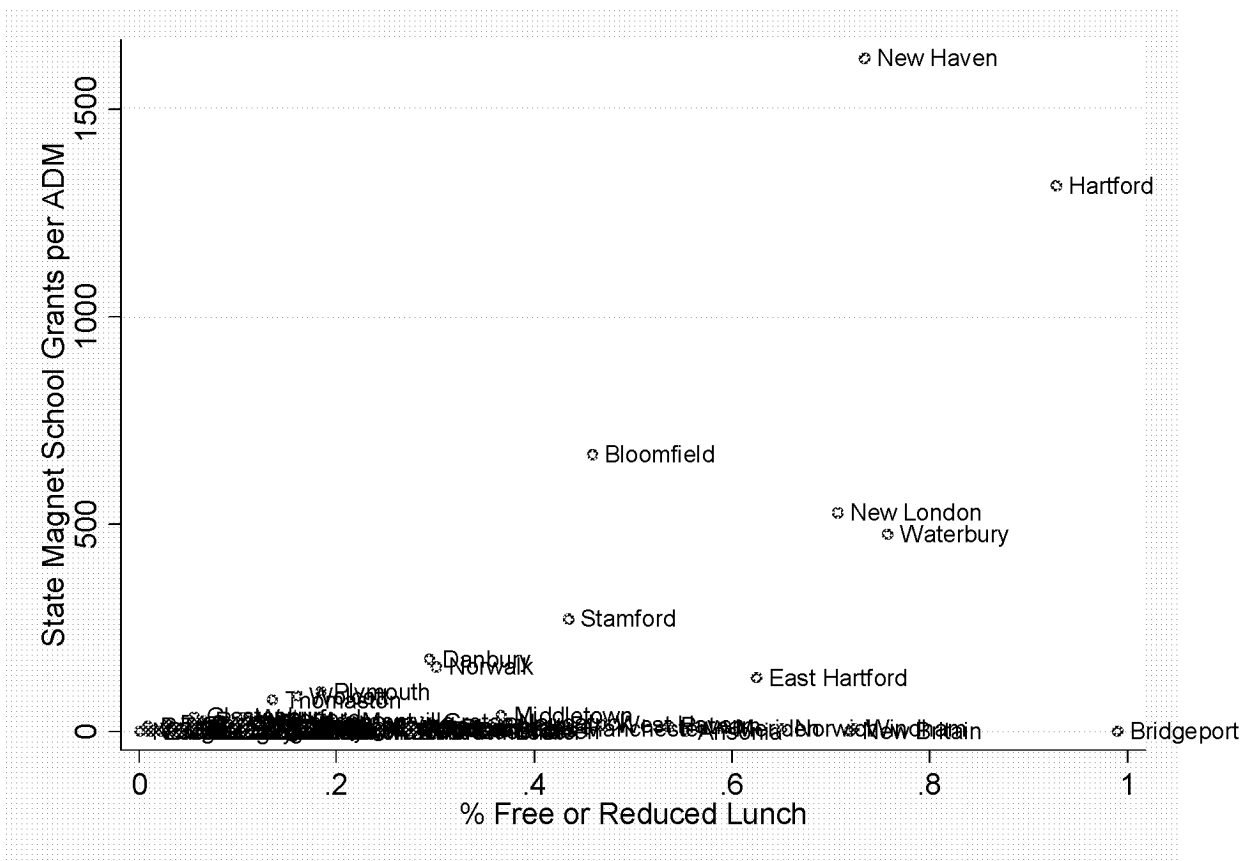


Figure 3 shows the distribution of Magnet School Aid per pupil across districts. High poverty districts also tend to receive more magnet school aid. However, magnet school aid is concentrated on some high poverty district much more than others. Magnet School Aid appears

<sup>100</sup> Data on categorical allocations indicate that Priority School District Aid was allocated in similar amounts in 2008, at an average of \$235 per ADM. In our analyses of EEO and Adequacy shortfalls we use Net Current Expenditures, which are defined as follows: “Net current expenditures (NCE) are calculated as defined in Connecticut General Statutes (C.G.S.) Section 10-261(a)(3). NCE includes all current public elementary and secondary expenditures from all sources, excluding reimbursable regular education transportation, tuition revenue, capital expenditures for land, buildings and equipment, and debt service. The principal portion of debt service for items that can be included in NCE, such as certain minor repairs and roof replacements, may count toward NCE.” See the End of Year School Report (ED001). <http://www.sde.ct.gov/sde/cwp/view.asp?A=2635&Q=320562>

to account for a substantial portion of the disparity in EEO gaps between New Haven and Hartford, on the one hand, and Waterbury, Bridgeport, and New Britain on the other. Hartford and New Haven each receive over \$1,000 per pupil (New Haven over \$1,500) in Magnet program aid per pupil, whereas Waterbury receives much less and New Britain and Bridgeport none. It is worth noting that some portion of magnet school aid benefits students who reside outside the districts that receive the aid, but attend the magnet school operated by the district.

**Figure 3: Magnet School Aid**







**Figure 5: Special Education Excess Cost**



## Conclusion

Categorical grants play a small role in supporting the operating expenditures of school districts in Connecticut. Because larger amounts of categorical grant funding flows to districts with higher levels of poverty, these grants do help to reduce EEO and Adequacy Funding gaps. However, the amount of additional funding provided by these programs is small relative to the needs of high poverty districts. Thus, neither the adjustments for student need in the ECS formula nor categorical grant programs are sufficient to address the needs of high poverty districts. As a result, when we examine comprehensive measures of district spending relative to district costs and spending needs, as we did in the body of the report, we find large EEO and Adequacy gaps.

## **APPENDIX A: Evaluating Methods and Findings of the Connecticut Adequacy Study**

Bruce Baker

In 2005, John Augenblick and colleagues produced a report titled: *Estimating the Cost of An Adequate Education in Connecticut*. In this study, Augenblick and his colleagues used what is known as a resource cost model approach to determine the cost of an adequate education. This appendix provides a limited analysis of the Augenblick studies centered on two basic questions:

- 1) Was the Augenblick study built on a rational process, applying methods consistent with other input-oriented studies of educational costs?
- 2) Are the findings of the Augenblick study consistent with those of other input-oriented studies of educational costs?

We begin by discussing the general approach to estimating the cost of an adequate education in this study, and setting it in the context of the broader literature on the cost of adequacy. Next, we examine the definition of adequate student achievement that the Augenblick study used, and then demonstrate that the methods used and findings of the study are consistent with other cost studies.

### **Approaches to Estimating the Cost of An Adequate Education**

There exist two general approaches to determining the cost of providing an adequate education in any given context.

Input-oriented: The first involves prescribing the resources or inputs necessary for providing basic educational services and special educational services sufficient to achieve specified educational achievement standards. Inputs required for service delivery may either be prescribed by panels of local constituents, practitioners and experts, or by outside expert consultants. This approach leads to estimates of the costs of recommended educational services for different settings and children, the intent being that the differential services (and resulting cost differentials) recommended will aid in the attainment of common educational outcomes.

Outcome-oriented: A different approach involves estimating a model of the statistical relationships among existing spending levels, outcome levels and district characteristics. This approach uses existing data to estimate underlying

differences in “costs” of producing specific levels of education outcomes across different settings.

The advantage of outcome-oriented analyses is that they draw on observed relationships between spending levels and desired outcomes. The relationship between outcomes and inputs in input-oriented analyses is more speculative. Input oriented analyses hypothesize a relationship between prescribed inputs and desired outcomes based on knowledge and expertise of those proposing the inputs.

But, input-oriented analyses also have some advantages over outcome oriented analyses that rely solely on measured outcomes. In most cases, not all goals and objectives of state education systems are measured directly. Rather, in most cases, the only measures that exist are assessment scores across core content areas, and perhaps other measures such as graduation rates. States may desire that students not only achieve minimally adequate assessment outcomes but also have access to broad and deep curricular opportunities. Input oriented analyses may be useful for estimating the full costs of appropriately broad and deep curricular opportunities across various types of schools, whereas outcome-oriented cost estimates may identify minimum costs as the amount spent by districts forgoing curricular depth and breadth and channeling all resources into minimally adequate measured outcomes.

The Augenblick Adequacy study applies primarily the first of the two methods described above – a resource cost model approach to determining the schooling inputs required to achieve desired educational outcomes in districts serving different student populations. The authors also estimated the average spending of districts presently meeting specific outcome targets (a variation on the outcome-oriented approach).

## **Outcome Standards & Application in the Augenblick Study**

As described in their report, Augenblick and colleagues included a variety of outcome measures, and considered a variety of input requirements in developing their cost estimates.

“To conduct the successful school district and professional judgment group studies, APA reviewed current Connecticut statutes, state board position statements and guidance, and student achievement results. From this collection of expectations and results, APA determined the cutoff scores for student achievement results that became the basis for selecting school districts for the successful school district approach. In addition, this collection helped APA develop a description of expectations and results that was ultimately used by the professional judgment panels in their deliberations about what resources are needed to help virtually all students meet state standards.

For the professional judgment panels, APA created a seven page summary of the state's legislative requirements, state board guidance and performance expectations. This document, included in Appendix B of this report, was given to every panel member. Panelists were instructed to focus on this standard to estimate the resources that schools and districts need to be successful. As the document shows, APA found that Connecticut statutes and rules establish both input and output standards.

The input standards focus on two key elements:

- (1) Length of the school year; and
- (2) Prescribed courses of study.

Further, the state board of education offers districts guidance in a number of areas including pre-school, standards of performance and accountability and the equality of education opportunity. It is expected that local education leaders and educators strive to produce a highly educated citizenry, Connecticut's most valuable resource."<sup>101</sup> (p. 5-6)

The Professional Judgment Panels were asked to address specific curricular requirements and mandates (pertaining to inputs) that may not sufficiently be captured in the outcome based analysis. It is certainly conceivable that "successful" school districts serving advantaged student populations could surpass measured cut scores without meeting prescribed course of study requirements or providing pre-school programs.<sup>102</sup> The professional judgment analysis attempts to correct for these shortcomings in the outcome measures.

For the successful school districts analysis, Augenblick and Colleagues identified 35 school districts (25 k-12, 3 regional and 7 k-6 districts) that met the "2007-08 AYP Proficient level consistently for three consecutive school years (2001-02, 2002-03 and 2003-04)." (p. 8). Augenblick and colleagues emphasize that the choice to focus on "proficiency" cut scores, rather than a higher "goal" cutoff, "represented a conservative student achievement objective that a reasonable number of districts could meet."<sup>103</sup> The analysis identifies a handful of districts able to surpass these measured outcome standards regardless of their student populations and

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<sup>101</sup> Augenblick, et al., *Estimating the Cost of an Adequate Education in Connecticut*, p. 5-6.

<sup>102</sup> Students in affluent districts may have access to high quality private pre-school programs, and thus a analysis of public expenditures in successful schools might not accurately reflect the cost pre-school education

<sup>103</sup> John Augenblick, et al., *Estimating the Cost of an Adequate Education in Connecticut*," p. 8. When compared to NAEP scores, the relative rigor of cut scores on Connecticut assessments varies, from relatively high for 4<sup>th</sup> grade reading to relatively low for 8<sup>th</sup> grade reading. See: <http://nces.ed.gov/nationsreportcard/pdf/studies/2010456.pdf>

regardless of the labor market in which they operate. As such, the average expenditures of these districts may not represent the expenditures needed in non-comparable districts in order to meet the same standards. As such, we consider the successful schools analysis of little relevance and focus our discussion on the professional judgment analysis.

### **The Connecticut Adequacy Study was built on a rational process, applying methods consistent with other studies by the same authors and other studies using the same method**

Resource cost analysis involves identifying the human and material resources, as well as their organization, required to provide a set of educational services. Resource cost analysis can be conducted in a number of ways and for a number of purposes. For example, resource cost analysis has been used to identify resources required for existing programs or schools, or a “what is” resource cost analysis. For example, one could evaluate existing expenditures on various resources associated with the provision of special education programs and services, as they exist, adequate or not and regardless of outcomes produced.<sup>104</sup> “What is” resource cost analysis can be useful when there are clear examples of programs and schools that consistently achieve outcome goals. Determining the costs of existing programs and services can provide insights into the costs of implementing comparable programs and services in other settings.

Alternatively, panels or focus groups might be convened to design and identify resource requirements for a hypothetical set of services that can achieve desired goals. This approach is referred to as professional judgment (PJ) analysis, and has been commonly used to estimate the costs of providing adequate educational programs and services since the mid-1990s.<sup>105</sup> Since that time, various teams of consultants have worked with state governments and interest groups to convene “professional judgment panels” and identify required resources for hypothetical schools and districts.

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<sup>104</sup> See for example: U.S. Department of Education. National Center for Education Statistics. *Measuring Resources in Education: From Accounting to the Resource Cost Model Approach*. Working Paper No. 1999-16, by Jay G. Chambers. Project Officer, William J. Fowler, Jr. Washington, D.C.: 1999.

<sup>105</sup> Arguably the first professional judgment study was conducted for Wyoming by Management Analysis and Planning. See: James Guthrie and Richard Rothstein, (1999) “Enabling Adequacy to Achieve Reality: Translating Adequacy into State School Finance Distribution Arrangements,” in *Equity and Adequacy in Education Finance: Issues and Perspectives*, eds. Helen F. Ladd, Rosemary Chalk and Janet S. Hansen (Washington, DC: National Academy Press, 1999), 209-259. This study was soon followed by competing studies in Maryland. See: Bruce D. Baker, Lori Taylor and Arnold Vedlitz, *Measuring Educational Adequacy in Public Schools*. Texas Joint Committee on Public Education Finance, 2004.  
[https://bush.tamu.edu/research/workingpapers/ltaylor/measuring\\_edu\\_adequacy\\_in\\_public\\_schools.pdf](https://bush.tamu.edu/research/workingpapers/ltaylor/measuring_edu_adequacy_in_public_schools.pdf)

I have written multiple reviews, summaries and critiques of these studies over time, evaluating their consistency in application of methods and their findings, including most recently, a review for the National Research Council.<sup>106</sup> For the most part, professional judgment studies conducted after the first few years of such studies follow relatively consistent methods. Those methods typically involve identifying a handful of prototype districts that represent the common configurations (size, grade range) of districts in a state, providing descriptions of curricular requirements, mandates and outcome objectives, and convening panels of practitioners and experts to propose resource configurations for the prototypes.

Most studies conducted around the time of the Connecticut study used three sets of panels: Round 1 panels of school based professionals to propose resource configurations for prototype schools, Round 2 panels to consider the district organization of those schools and additional district level resources that may be required, and a Round 3 panel of experts and policy makers to review, evaluate and critique, as well as synthesize the work of Round 1 and 2 panels. More recent studies have added “special needs” panels to address in greater depth the needs of specific student populations, and in the case of the Pennsylvania study, a specific panel to explore the unique needs of Philadelphia school district, a significant outlier in that state in many regards.

Table A.1 provides a brief listing of the panel structure for Augenblick PJ studies conducted since 2002 (Kansas, arguably the beginning of the multiple prototype era). All studies but one – New Jersey – follow a consistent methodology of soliciting professional insights on school prototypes in order to determine resource configurations. Augenblick and Associates allowed Department of Education Officials to propose initial prototype resources in New Jersey and allowed professional judgment panels only to react to and/or edit the NJDOE proposals. The Connecticut study, conducted after but released before the New Jersey study (released in 2006, in very different format from all others), was conducted by methods consistent with other Augenblick studies conducted around the same time and only differs from later studies in that it does not include additional panels focused on special needs or specific urban districts. A more detailed description of each study using language copied directly from the reports is provided at the end of this appendix.

The Augenblick study performed for the Connecticut Coalition for Justice in Education Funding conformed to standard methodologies applied by Augenblick and colleagues, whether in their consulting work for advocacy organizations or in their consulting for state officials. There are no notable deviations in their Connecticut analysis that would make the analysis clearly biased in favor of the advocacy organization that sponsored the study. Notably, I have not

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<sup>106</sup> ; Baker, “Evaluating the Reliability, Validity and Usefulness of Education Cost Studies”; Baker, “The Emerging Shape of Educational Adequacy: From Theoretical Assumptions to Empirical Evidence”; Baker, Taylor, and Vedlitz, “Measuring Educational Adequacy in Public Schools”; Baker, Taylor, and Vedlitz, “Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction”.

conducted extensive analysis of the affiliations or experience distributions of panel members, nor have I thoroughly vetted language used in framing standards provided to panels. In general, the broad framework of methods, goals, types of panels, distribution of prototypes is consistent with other Augenblick studies.

**Table A.1 - Summary of Augenblick and Associates Studies Since 2002**

State	Year	Round 1	Round 2	Round 3	Round 4	Round 5
Montana	2007	School Panels	Special Needs Panels	District Panels	Statewide Review Panel	
Pennsylvania	2006	School Panels	Special Needs Panels	District Panels	Philadelphia/Urban Panels	State Review Panel
Nevada	2006	School Panels	District & Specialist Panels	Overview/Review Panel		
Connecticut	2005	School Panels	District Panels	Overview/Review Panel		
South Dakota	2005	School Panels	District Panels	Overview/Review Panel		
North Dakota	2004	School Panels	District Panels	System-wide Review panel		
Nebraska	2004	School & Elem. District Panels	District Panels	Expert review panel		
New Jersey	2006	NJDOE	District/School Reactors	District Reviewer Panel		
Tennessee	2003	School Panels	District Panels	System-wide Review panel		
Colorado	2003	School Panels	District Panels	Expert review panel		
Missouri	2003	School Panels	District Panels	Expert review panel		
Kansas	2002	School Panels	District Panels	Expert review panel		

See Table A.2 at the end of this Appendix for more detail.

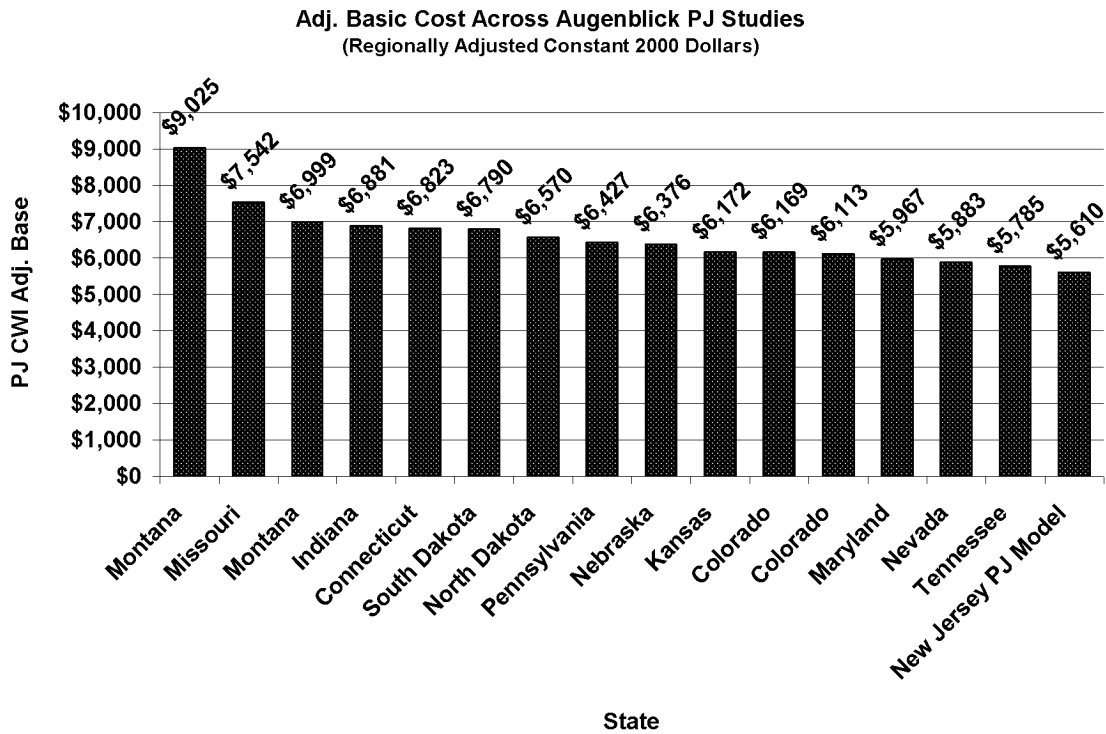
**The Connecticut Adequacy Study produced findings that are consistent with other studies by the same authors and other studies using the same method**

Since 2004, I have conducted a series of analyses of the findings of educational adequacy studies. The following figures are drawn from those studies. None of the findings of the Augenblick et al. study stand out as peculiar among their recent studies. For example, Figure A.1



reports the estimates of base costs adjusted for regional differences in competitive wages and inflation adjusted (to year 2000 dollars). Base costs are the per pupil spending required to achieve standards in the district type with the lowest cost, and excludes any adjustments for the additional costs associated with high need students. Estimates of base costs for Connecticut are comparable to those for most other states, with the extremes being the New Jersey estimate at the low end, and Montana and Missouri at the high end.

**Figure A.1 –Basic Cost Estimates Across Augenblick PJ Studies  
(Regionally Adjusted Constant 2000 Dollars)**



*Original Sources of Data for this Analysis:*

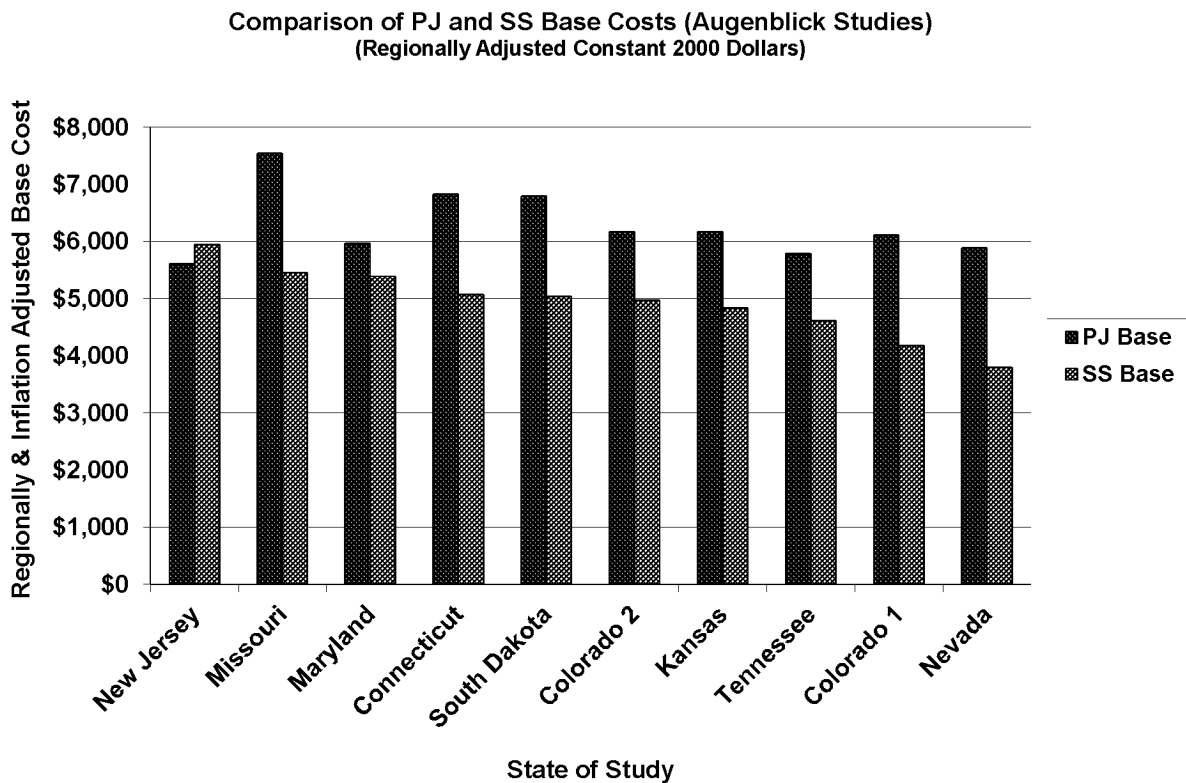
[https://bush.tamu.edu/research/workingpapers/ltaylor/measuring\\_edu\\_adequacy\\_in\\_public\\_schools.pdf](https://bush.tamu.edu/research/workingpapers/ltaylor/measuring_edu_adequacy_in_public_schools.pdf) & Baker, B.D., Taylor, L.L., Vedlitz, A. (2008) Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction. *National Research Council*.

Figure A.2 summarizes PJ and successful schools estimates, where the later reflect the average spending of districts meeting specific measured standards. In most cases, the average spending of districts meeting measured standards (which vary by state based on available measured outcomes) falls below the PJ adequacy estimates. One might attribute the differences,

in part, to differences in the measurable standards used in the successful schools analysis and potentially wider array of considerations addressed by PJ panels.

Figure A.2 indicates that the difference between the PJ estimate and the successful schools estimate in Connecticut is not greater than the differences in other states. The differences between the PJ and successful school estimates are roughly consistent across studies, but for the Maryland study which was conducted much earlier, and the New Jersey study which strayed from conventional methods for the PJ analysis.

**Figure A.2 –PJ and Successful School Base Cost Estimates for Augenblick et al. Studies  
(Regionally Adjusted Constant 2000 Dollars)**



*Original Sources of Data for this Analysis:*

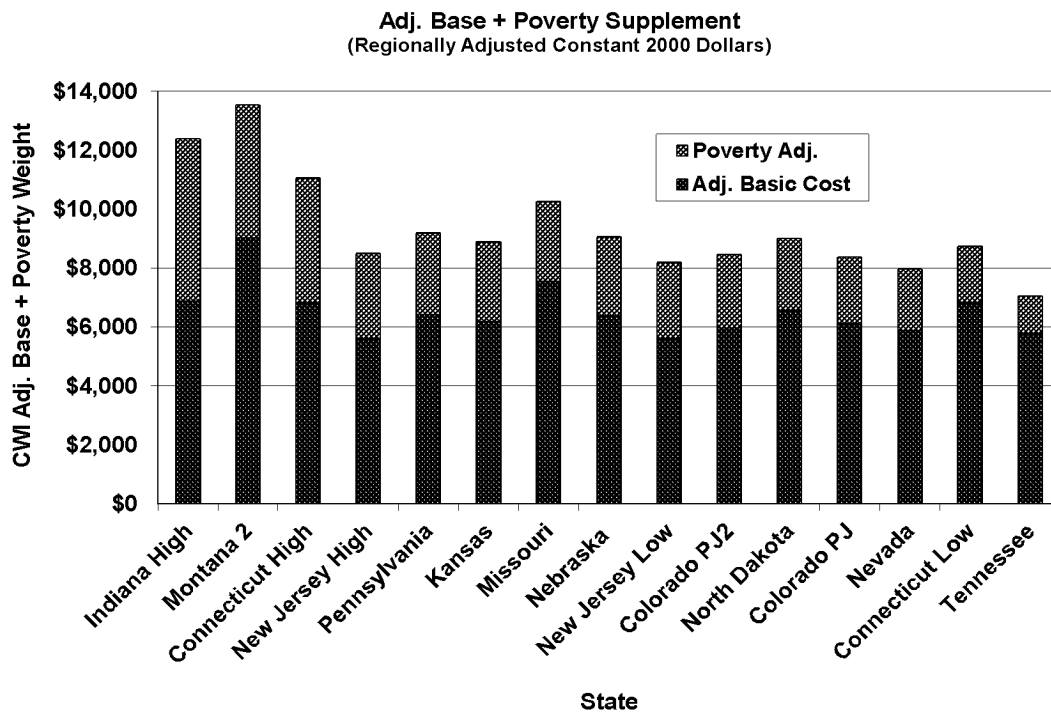
[https://bush.tamu.edu/research/workingpapers/taylor/measuring\\_edu\\_adequacy\\_in\\_public\\_schools.pdf](https://bush.tamu.edu/research/workingpapers/taylor/measuring_edu_adequacy_in_public_schools.pdf) & Baker, B.D., Taylor, L.L., Vedlitz, A. (2008) Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction. *National Research Council*.

Figure A.3 addresses the “additional costs” associated with children in poverty identified across several Augenblick PJ studies. The blue bars represent the base cost for a scale efficient (enrollment over 2,000) prototypical district, with no additional student needs. The red bars represent the additional costs associated with each student from economically disadvantaged

background. Because the studies are done in different years and across states where labor costs vary widely, I use the National Center for Education Statistics Comparable Wage Index to adjust for both inflation and regional variation in costs.

Like a handful of other studies, the Connecticut study provides a range of additional cost weights for children in poverty. For example, the PJ study estimates poverty weights separately for each grade range and enrollment size prototype considered by panel members. Different weights result from different proposed staffing configurations to meet additional student needs, where supplemental staffing configurations result in varied additional costs in smaller and larger districts, and in unified versus elementary school districts. In some studies, like the Connecticut study, different weights also occur at different concentrations of poverty, producing a range of additional costs per additional child in need at different concentrations of children in need. Considering the high and low estimates of additional costs for Connecticut districts, those weights fall toward, though not at, the ends of the distribution of weights. The low is relatively low and the high relatively high.

**Figure A.3 – Adjusted Base Plus Poverty Supplement  
(Regionally Adjusted Constant 2000 Dollars)**



*Original Sources of Data for this Analysis:*

[https://bush.tamu.edu/research/workingpapers/ltaylor/measuring\\_edu\\_adequacy\\_in\\_public\\_schools.pdf](https://bush.tamu.edu/research/workingpapers/ltaylor/measuring_edu_adequacy_in_public_schools.pdf) & Baker, B.D., Taylor, L.L., Vedlitz, A. (2008) Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction. *National Research Council*.

Weights reported in Figure A.3 are based on the weight calculations in the Augenblick PJ studies for individual prototypes and poverty concentrations, as reported (p. iv) and range from .28 (for 90% poverty and higher) to .62 (for the first 10% in poverty).<sup>107</sup> That is, in this study, poverty weights decline as poverty rate increases. Alternatively, one can compare the effect of the weights on the distribution of funding, rather than comparing the weights themselves. In a previous paper for the National Research Council, I used district level estimates of adequate funding for each school district in states where cost studies had been done, and fit trendlines to the cost estimates for each district. Across several studies and states, I found weights from about 60% to over 100% (Table 2, page 14).<sup>108</sup>

Using a similar method with the Connecticut data, and fitting a trendline to cost estimates for each district provided in the Augenblick reports, I find that the hypothetical district with 0% low income (free or reduced lunch) students would need \$11,555. The hypothetical district with 100% low income students would need \$6,624 more per pupil, toward achieving adequate outcomes, or a total of \$18,079. This translates to a weight on children qualified for free or reduced lunch of  $\$6,624/\$11,555 = 56.5\%$ , or toward the low end of weights when compared with other states and studies in my previous work. Further, this poverty weight is only slightly higher than our low end poverty weighting used in our equal educational opportunity analysis.

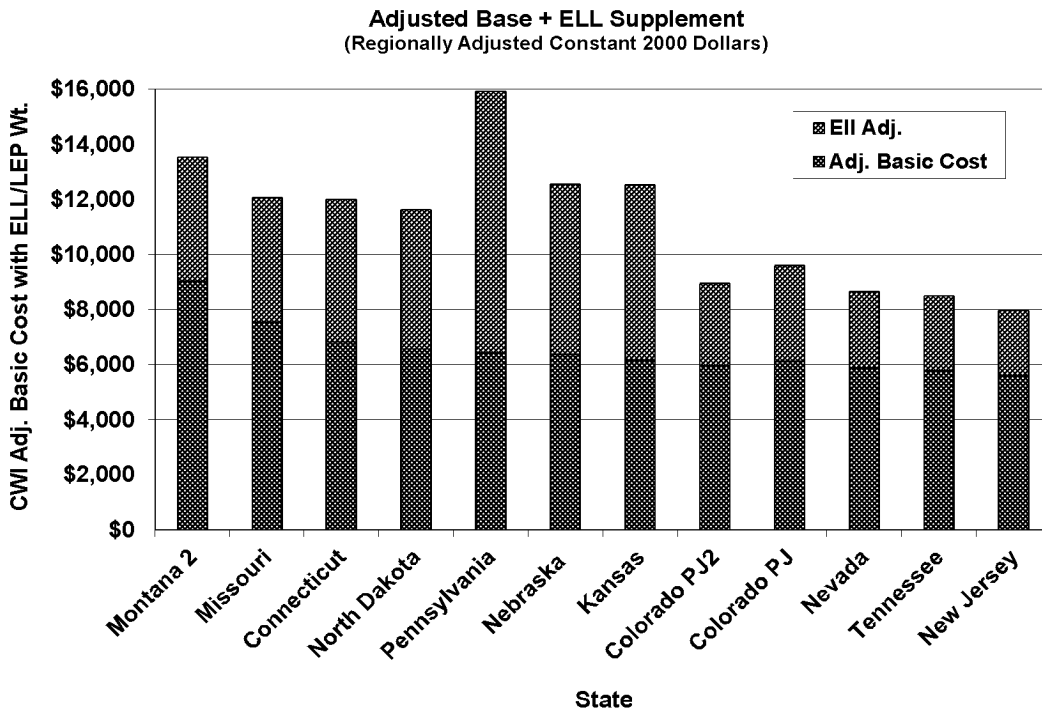
Figure A.4 summarizes the LEP/ELL adjustment across Augenblick professional judgment cost studies. Only the Pennsylvania study produces an ELL weight significantly larger than other studies. Kansas and Nebraska weights are also quite large. But the Connecticut additional costs for LEP/ELL children are well in line with other estimates. Weights in other states such as New Jersey are very low by comparison.

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<sup>107</sup> J. Augenblick, R. Palaich, J. Silverstein, D. Rose, D. DeCesare (2005) Estimating the Cost of An Adequate Education in Connecticut. Denver, Co: Augenblick, Palaich and Associates.

<sup>108</sup> For details, see: B.D., Taylor, L.L., Vedlitz, A. (2008) Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction. *National Research Council*.

**Figure A.4 – Adjusted Base Plus LEP/ELL Supplement  
(Regionally Adjusted Constant 2000 Dollars)**



*Original Sources of Data for this Analysis:*

[https://bush.tamu.edu/research/workingpapers/ltaylor/measuring\\_edu\\_adequacy\\_in\\_public\\_schools.pdf](https://bush.tamu.edu/research/workingpapers/ltaylor/measuring_edu_adequacy_in_public_schools.pdf) & Baker, B.D., Taylor, L.L., Vedlitz, A. (2008) Adequacy Estimates and the Implications of Common Standards for the Cost of Instruction. *National Research Council*.

Detailed Summary of Augenblick Studies							
State	Pennsylvania	Montana	Nevada	South Dakota	Connecticut	Nebraska	North Dakota
Year	2007	2007	2006	2005	2005	2004	2004
<b>Panel 1 Composition</b>	School Representatives	School level panels. Four separate panels were convened to identify school level resource needs in each of the four hypothetical K-12 school districts.	combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, and school business officials	Panels had 6-8 participants, including a combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, and school business officials.	Each panel had 6-8 people, including a combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, and school business officials. Multiple panels were used to deal with schools and districts of varying sizes so that APA could determine whether size had an impact on cost.	An elementary district panel was created to specify the school-level and district level resource needs of elementary districts. A school-level panel was created to specify the resource needs of schools in very small and small k-12 districts. A school-level panel was created to specify the resource needs of schools in moderate size k-12 districts. A school-level panel was created to specify the resource needs of schools in large k-12 districts.	A panel was created to specify the resource needs of a single school/district for both very small and small K-8 school districts. A school-level panel was created to specify the resource needs of single school buildings in very small and small K-12 districts. A school-level panel was created to specify the resource needs of elementary and secondary schools in moderate size K-12 districts. A school-level panel was created to specify the resource needs of elementary, middle, and high schools in large districts.
<b>Panel 1 Goal</b>	Three panels were convened to address the school-level resource needs of the five hypothetical K-12 school districts. As mentioned previously, APA determined that school size was similar in the moderate, large, and very large districts so the school-level needs of these districts were addressed in a single panel. Each panel was charged with designing schools to accomplish a specific set of performance objectives and standards (which are	All panels "built" hypothetical elementary, middle, and high schools designed to accomplish specific performance objectives and standards (which are described in the next section on "Professional Judgment Panel Procedures"). All panels looked at school-level resources needed for "regular" education students (students with no special needs), as well as for at-risk and LEP students. These four panels did not,	Two panels were convened to address school-level needs in three hypothetical K-12 school districts (small, moderate, and large). Schools in moderate and large districts were addressed in a single moderate/large panel. Both the small panel, and the moderate/large panel "built" hypothetical elementary, middle, and high schools designed to accomplish a specific set of performance objectives and standards (which are described later in this chapter in the section	School-level panels. Three panels addressed the school-level needs in different district configurations.	School-level panels "built" hypothetical elementary, middle, and high schools designed to accomplish a specific set of performance objectives and standards (which are described in the next section on "Professional Judgment Panel Procedures")		

	described in detail in the next section on "Professional Judgment Panel Procedures").	however, identify resources for special education students (these were examined by the special needs student panels, see below)	on "Professional Judgment Panel Procedures")				
<b>Panel 2 Composition</b>	Teachers of Special Populations	Special Needs panels. Two panels were convened: one to focus on special needs populations for small/moderate sized districts; and the other to focus on the special needs	combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, and school business officials	District-level panels. Three panels handled different size K-12 districts. Very small and small districts were addressed in a single panel, while moderate and large districts each had a separate panel.	District-level panels reexamined the work of the school-level panels and added personnel and other costs that tend not to be school-based (such as costs for district business staff or for an alternative school)	A district-level panel was created to review the school-level costs of small k-12 districts and to specify the resource needs of small k-12 districts. A district-level panel was created to review the school-level costs of moderate size k-12 districts and to specify the resource needs of moderate size k-12 districts. A district-level panel was created to review the school-level costs of large k-12 districts and to specify the resource needs of large k-12 districts.	A district-level panel was created to review the school-level costs of both very small and small K-12 districts and to specify the district resource needs of very small and small districts. A district-level panel was created to review the school-level costs of moderate size districts and to specify the district resource needs of moderate size districts. A district-level panel was created to review the school-level costs of large districts and to specify the district resource needs of large districts.
<b>Panel 2 Goal</b>	Two panels were held to look at resources needed to serve specific student populations. One panel looked at resources in the small districts while the other looked at resources in moderate, large, and very large districts. Each panel reviewed the resources specified by the previous school-level panel for poverty, gifted, and ELL students, then layered in resources for special education students. Each panel also built in the district-level resources needed for each special need student population and the moderate, large, and very large panel "built" three separate sets of	populations of large/very large sized districts. The special needs panels reviewed the resources identified by the school-level panels for at-risk and LEP students then also discussed and identified added resources needed for special education students. Once school-level resources were identified both panels built in any additional district-level resources required for special needs students.	Three panels were held at this stage: one districtlevel panel, a panel for special needs populations, and a panel for CTE				

	district-level resources.						
<b>Panel 3 Composition</b>	Four district-level panels were held at this stage, one each for small, moderate, large, and very large districts. Each panel reviewed the work of the previous school-level and special needs panel for their size group, and then added in district-level resources for all students.	District panels. Two district-level panels were conducted, one for small and moderate size districts and one for the large and very large districts. The district panels first reviewed the work of the school-level and special needs panels. Then they added any district-level resources needed for regular students.	State Officials	Overview panel. The overview panel reviewed the work of all other panels.	The overview panel reviewed the work of the district panels, discussed resource prices, examined preliminary cost figures and attempted to resolve some of the inconsistencies that arose across panels	We use the term "expert" to designate a small group of people with a broader set of responsibilities than the school-level or district-level panels; in fact, all panel participants were experts based on their education, experience, knowledge, reputation, and/or recognition.	A system-wide panel was created to review the work of all of the district-level resource panels and to discuss the prices (primarily salaries and benefits) needed to cost out personnel resources.
<b>Panel 3 Goal</b>	The statewide panel reviewed the work of all earlier panels, discussed resource prices, examined preliminary cost figures, and attempted to resolve some of the inconsistencies that arose across panels.		This panel reviewed previous panel work, discussed resource prices, examined preliminary cost figures and attempted to resolve some of the inconsistencies that arose across panels			An "expert" panel was created to review the work of all of the district-level resource panels and to discuss the prices (primarily salaries and benefits) needed to cost out personnel resources.	
<b>Additional Panel 1</b>	Two additional panels were held to look at resources needed to serve students in Philadelphia. One panel looked at K-8 schools commonly found in Philadelphia, and the other reviewed the work of the very large panel at the school and district level to decide if the resource allocation would be different because of the district's much larger size and urban	Statewide overview panel. The statewide overview panel reviewed the work of all previous panels. The overview panel looked to resolve any inconsistencies in the school or district findings of previous panels and provided input regarding salary comparisons with other states.					



<p><b>Goal</b></p>	<p>setting. All panels had 5-8 participants, including a combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, and school business officials. In total, 66 panelists participated in the five rounds of panels.</p>					<p>The panels developed an underlying philosophy and specified the resource needs of prototype schools (and, in the case of elementary districts, district-level needs). Resources included the number of staff needed during the school year, the availability of supplemental learning opportunities (during the regular school year and during the summer), the availability of services for some children before kindergarten, equipment, professional development, technology, support services, and non-academic activities.</p>	
<p><b>Notes</b></p>	<p>To accomplish this task, it was necessary for panelists to understand the state's academic performance standards (these are described in Appendix D of this report). Panelists were instructed to focus on this standard in order to appropriately estimate the resources that schools and districts</p>			<p>In particular, panelists were instructed that their task was to identify what constitutes an "adequate" level of resources for hypothetical schools and districts. To accomplish this task, it was therefore necessary for panelists to understand the state's academic performance standards. These</p>			

	<p>need to be successful. Panelists were instructed not to build their "dream" school, but to identify only those resources specifically needed to meet Pennsylvania performance standards.</p>			<p>standards are described in Chapter II of this report. Panelists were instructed to focus on this standard in order to appropriately estimate the resources that schools and districts need to be successful.</p>			
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## Appendix B. Listing of Districts by Resource, Outcome Quadrants

Quadrant 1 – Low Resource, High Outcome		Quadrant 2 – High Resource, High Outcome	
Bethel		Avon	Madison
Brookfield		Berlin	New Canaan
Colchester		Branford	New Milford
Coventry		Cheshire	Newington
Ellington		Clinton	North Haven
Ledyard		Cromwell	Ridgefield
Monroe		Darien	Rocky Hill
New Fairfield		District No. 10	Simsbury
Newington		District No. 13	South Windsor
Newtown		District No. 14	Southington
North Branford		District No. 15	Stonington
North Haven		District No. 17	Suffield
Shelton		East Hampton	Wallingford
Tolland		East Lyme	Waterford
Trumbull		Fairfield	West Hartford
West Hartford		Farmington	Weston
Wolcott		Glastonbury	Westport
		Granby	Wethersfield
		Greenwich	Wilton
		Guilford	
Quadrant 4 – Low Resource, Low Outcome		Quadrant 3 – High Resource, Low Outcome	
Ansonia	New Britain	Bloomfield	
Bridgeport	New Haven	Coventry	
Bristol	New London	District No. 16	
Colchester	North Branford	Groton	
Danbury	Norwalk	Hamden	
East Hartford	Norwich	Killingly	
East Haven	Seymour	Ledyard	
Enfield	Stamford	Milford	
Griswold	Stratford	Plainfield	
Hartford	Vernon	Plainville	
Manchester	Waterbury	Torrington	
Meriden	Watertown	Wallingford	
Middletown	West Haven	Watertown	
Montville	Windham		
Naugatuck	Windsor		

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