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Nicola Alexander
University of Minnesota

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The Growth of Education Revenues from 1998-2006: An Update on What Accounts for Differences among States and the District of Columbia in the Context of Adequacy

Nicola A. Alexander

This article is an update of a previous study by the author which examined the growth of elementary and public school revenues for school years 1982-1983 through 1991-1992 (Alexander 1997). Using the same framework, this study provides an analysis of the factors accounting for changes in real per-pupil revenues across the 50 states and the District of Columbia for school years 1997-1998 through 2005-2006.¹ The implications of these findings for fiscal adequacy are also explored. Four questions guided the analysis:

- (1) Did locales with relatively big enrollment increases tend to have lower growth in per-pupil revenue?
- (2) Did levels of revenues per pupil tend to converge?
- (3) What effect did economic growth have on increases in per-pupil revenues?
- (4) Which funding source(s) contributed most to per-pupil revenue growth--federal, state, or local?

The results of this study will be of particular interest to state policymakers who often want to know how their state compares with others.

Using descriptive analysis, including rankings and graphical cross-tabulations, and regression analysis, this article provides a comprehensive picture of the educational dollars raised at the local, state,

and federal levels for 1998-2006. It also explores the regional and political patterns that may be reflected in a state's overall education revenues in 2006; per-pupil revenue growth 1998-2006; and differences between 2006 per-pupil revenue levels and a prescribed adequacy level.² To that end, the article is divided into eight sections:

- ◆ About the data
- ◆ Revenue increases and changes in enrollment
- ◆ Convergence of revenue levels
- ◆ Economic growth and revenue increases
- ◆ Revenue increases and the joint association of key variables
- ◆ Source of revenues
- ◆ Adequacy across the states and the District of Columbia
- ◆ Policy implications and conclusions

The article closes with a comparison of the changes found in this analysis and the previous study, placing that analysis in the context of what adequate education funding means for states and the District of Columbia.

About the Data

The data used in this article came from the U.S. Department of Education National Center for Education Statistics (NCES) Common Core of Data (CCD), the U.S. Department of Commerce Bureau of Economic Analysis (BEA), and the U.S. Department of Labor Bureau of Labor Statistics (BLS). From the CCD, the study used 1998-2006 public elementary and secondary education revenues and student enrollments.³ The BEA provided personal income by state which was used as a measure of economic growth; and, from the BLS, the study used the Consumer Price Index (CPI) to adjust education revenues for inflation.

Unlike Alexander (1997), this study included federal sources in addition to state and local government school revenues. The reason for this change was that while state and local governments continue to provide the bulk of revenue to schools, the federal government is playing an increasingly larger role. For example, in the decade spanning 1983-1992, the federal government accounted for approximately 7% of total education revenue. By 2006, the federal contribution had risen to 9.1%, and this was before increased federal contributions through the American Recovery and Reinvestment Act of 2009. Another difference between the data used in this analysis and the previous study is the inclusion of the District of Columbia. The District served about 77,000 students annually over the eight years examined. If this governmental unit is omitted from the analysis, an important facet of changes in per-pupil revenues across the nation would be left out.

The 1998-2006 revenue data were adjusted in three ways to facilitate analysis. First, the reported revenue aggregates were divided by the enrollment measure of state student populations to permit comparisons of different size states and to control for fluctuations in enrollment size in measuring revenue change over time.⁴ Second, nominal data reported by the states and the District of Columbia were adjusted to permit analysis in constant 2006 dollars, using the Consumer Price Index (CPI) to adjust for inflation. Subsequent discussion and tables are based on inflation-adjusted data,⁵ consistent with the method used in Alexander (1997). It should be noted, however, that from 1983 to 1992, the CPI and the implicit price deflator (IPD) measured similar rates of inflation: 41% inflation using CPI versus 40.5% using the IPD. In contrast, in the time period studied here, 1998 through 2006, the CPI showed a 21%

Nicola A. Alexander is Associate Professor in the Department of Organizational Leadership, Policy, and Development at the University of Minnesota. She has published in the American Educational Research Journal, Educational Policy, Journal of School Business Management, and Journal of Education Finance. She recently published Policy Analysis for Educational Leaders: A Step-by-Step Approach.

Table I
Per-Pupil Revenues, 1998

<i>Locale</i>	<i>Unadjusted (\$)</i>	<i>Rank</i>	<i>Adjusted (\$)</i>	<i>Rank</i>	<i>Difference (\$)</i>	<i>Change in Rank</i>
United States	7,067		7,067			
Alabama	5,535	46	6,182	45	-647	1
Alaska	9,222	4	9,168	2	54	2
Arizona	5,812	41	6,274	44	-462	-3
Arkansas	5,697	44	6,797	33	-1,100	11
California	6,572	30	6,058	48	514	-18
Colorado	6,297	35	6,747	36	-450	-1
Connecticut	9,643	3	8,987	5	656	-2
Delaware	8,160	10	8,231	15	-71	-5
District of Columbia	9,168	5	7,724	22	1,444	-17
Florida	6,533	32	7,203	28	-669	4
Georgia	6,571	31	6,579	37	-8	-6
Hawaii	6,755	25	6,876	31	-121	-6
Idaho	5,404	48	6,448	40	-1,044	8
Illinois	7,103	21	6,853	32	250	-11
Indiana	7,614	15	8,448	10	-835	5
Iowa	6,679	27	8,002	18	-1,323	9
Kansas	6,662	28	7,791	21	-1,129	7
Kentucky	5,875	39	6,499	39	-624	0
Louisiana	5,786	42	6,352	41	-566	1
Maine	7,530	16	9,059	4	-1,530	12
Maryland	7,770	13	7,313	25	456	-12
Massachusetts	8,318	7	7,868	19	450	-12
Michigan	8,416	6	8,491	9	-76	-3
Minnesota	7,649	4	8,008	17	-359	-3
Mississippi	4,770	51	5,520	50	-750	1
Missouri	6,595	29	7,272	26	-677	3
Montana	6,345	34	8,250	14	-1,905	20
Nebraska	6,711	26	8,009	16	-1,291	10
Nevada	6,442	33	6,276	43	166	-10
New Hampshire	6,770	24	7,485	24	-715	0
New Jersey	10,550	1	9,083	3	1,466	-2
New Mexico	5,887	38	6,577	38	-691	0
New York	9,708	2	8,674	7	1,034	-5
North Carolina	5,816	40	6,106	47	-291	-7
North Dakota	5,755	43	7,220	27	-1,465	16
Ohio	7,286	18	7,575	23	-289	-5
Oklahoma	5,478	47	6,325	42	-847	5
Oregon	7,175	20	7,798	20	-623	0
Pennsylvania	8,174	9	8,414	11	-239	-2
Rhode Island	8,245	8	8,407	12	-161	-4
South Carolina	6,151	37	6,758	34	-607	3

continued on next page

Table I (continued)
Per-Pupil Revenues, 1998

<i>Locale</i>	<i>Unadjusted (\$)</i>	<i>Rank</i>	<i>Adjusted (\$)</i>	<i>Rank</i>	<i>Difference (\$)</i>	<i>Change in Rank</i>
South Dakota	5,576	45	7,086	29	-1,510	16
Tennessee	5,393	49	5,767	49	-374	0
Texas	6,213	36	6,151	46	61	-10
Utah	4,774	50	5,109	51	-335	-1
Vermont	8,130	11	9,981	1	-1,851	10
Virginia	6,984	22	6,748	35	236	-13
Washington	6,957	23	6,950	30	7	-7
West Virginia	7,355	17	8,385	13	-1,030	4
Wisconsin	8,006	12	8,571	8	-565	4
Wyoming	7,229	19	8,876	6	-1,648	13

increase in inflation while the IPD for state and local governments was much higher, at 37.9%. To facilitate comparison with the previous analysis and because federal dollars were also included, inflation was accounted for using the CPI.⁶ Third, to have a better understanding of the relative standing of states and the District in terms of the revenues raised for schools at the start of the series, this study adjusted for price differences across states and the District of Columbia using the Comparable Wage Index (CWI) developed by Taylor and Fowler (2006).⁷

The CWI and other cost-of-living adjustments are irrelevant for most of the questions discussed in this study because they do not affect the percentage increase in per-pupil revenues. They do, however, affect one part of the analysis: Rankings of states and the District of Columbia in 1998 revenue levels, and relative changes that occurred during the following eight years.

Inflation-adjusted per-pupil revenues for 1998 are reported in Table I. The first numerical column lists per-pupil revenues that have not been adjusted for price level differences across states and the District of Columbia, while revenues in the third numerical column have been adjusted for price level differences using the CWI for 1998. States are ranked from high (1) to low (51) for both the unadjusted and adjusted figures. One of the biggest differences was found for Montana, which ranked 34th in unadjusted revenues but 14th based on the CWI. Seven other states had a ranking that was at least 10 places higher after revenues were adjusted: Arkansas (11), Maine (12), Nebraska (10), North Dakota (16), South Dakota (16), Vermont (10), and Wyoming (13). In contrast, seven states and the District of Columbia had rankings that were at least 10 places lower after revenues were adjusted: California (-18), District of Columbia (-17), Illinois (-11), Maryland (-12), Massachusetts (-12), Nevada (-10), Texas (-10), and Virginia (-13). These findings are in stark contrast with those of the previous study where many states had similar rankings before and after adjustment with the CWI. The disparities are important when considering the right amount of dollars to provide children with an adequate education. The findings imply that, now more than before, regional variation in prices matter and that there is no magical dollar amount that will meet the needs of children across the nation. Notwithstanding the rising importance of regional variations in price, three of the states

in the top five remained in the top five even after revenues were adjusted—Alaska, Connecticut, and New Jersey. Mississippi and Utah alternated in being ranked 50th and 51st based on whether adjusted or unadjusted numbers were used.

The bivariate relationship between the growth of per pupil revenues and enrollment growth, 1998 per pupil revenues, and per pupil personal income growth will be examined in the next three sections. Because these variables are related, bivariate analysis may overstate the association of any one factor. To address this issue, the joint association of these variables with revenue growth between 1998 and 2006 will be examined in the section following the individual analyses. Next, the source of revenue growth is examined along with the relative levels of education adequacy achieved by states. In the final section, policy implications, comparisons with the Alexander (1997) study, and conclusions are discussed.

Revenue Increases and Changes in Enrollment

Table 2 compares growth in real revenues, total and per-pupil, as well as changes in student enrollment. All three have to be considered to obtain a complete picture of how revenues changed in the period studied. For example, in Arizona, real total education revenues rose 54.28%, considerably more than the U.S. average of 31.99%, although Arizona's per-pupil revenues rose only 14.76%, ranking it 45th in the nation. At the same time, Arizona's student enrollment rose by 34.44%, second only to Nevada. Consequently, although Arizona's total education revenues rose much faster than the national average, they did not keep pace with the substantial increase in enrollment numbers. In contrast, Louisiana's total revenues rose only 24.31%, but per-pupil revenue increased by 47.53%, ranking the state third in the nation. However, Louisiana's student enrollments fell 15.74% during this time period.⁸

The five states with the biggest increases in per-pupil revenues were Hawaii (80.92%), Wyoming (55.64%), Louisiana (47.53%), Mississippi (44.64%), and Vermont (41.8%). Conversely, the five states with the smallest increases were Michigan (6.96%), North Carolina (11.73%), Idaho (11.47%), Washington (12.35%), and Oregon (13.21%). Unlike the previous study, no state saw a decline in per-pupil revenues.

Table 2
Revenue Growth, Total and Per Pupil, and Student Enrollment Growth, 1998-2006

Locale	Total Revenue Growth (%)	Rank	Per-Pupil Revenue Growth (%)	Rank	Enrollment Growth (%)	Rank
United States	31.99		23.96		6.47	
Alabama	26.47	29	27.74	23	-0.99	36
Alaska	16.16	44	15.14	43	0.88	28
Arizona	54.28	3	14.76	45	34.44	2
Arkansas	36.08	19	31.00	16	3.88	20
California	38.20	14	24.60	28	10.91	9
Colorado	38.83	12	22.33	31	13.48	7
Connecticut	39.50	10	29.82	19	7.45	12
Delaware	38.70	13	28.40	21	8.02	11
District of Columbia	40.40	9	40.83	8	-0.30	33
Florida	36.83	16	17.34	38	16.61	3
Georgia	47.31	4	26.81	25	16.17	5
Hawaii	74.19	1	80.92	1	-3.72	43
Idaho	19.49	39	11.47	49	7.19	13
Illinois	30.09	25	23.10	29	5.68	16
Indiana	23.31	36	17.56	36	4.89	18
Iowa	16.93	42	21.18	34	-3.51	42
Kansas	30.61	24	30.94	17	-0.25	32
Kentucky	24.21	34	22.28	32	1.58	27
Louisiana	24.31	33	47.53	3	-15.74	50
Maine	22.47	38	33.17	13	-8.04	45
Maryland	36.74	17	32.09	15	3.52	21
Massachusetts	45.01	5	41.59	6	2.41	22
Michigan	9.45	50	6.96	51	2.32	23
Minnesota	16.33	43	18.32	35	-1.68	39
Mississippi	41.82	8	44.64	4	-1.95	40
Missouri	22.59	37	21.64	33	0.78	30
Montana	10.13	49	22.94	30	-10.42	47
Nebraska	25.04	32	27.67	24	-2.06	41
Nevada	59.89	2	15.00	44	39.03	1
New Hampshire	43.12	6	40.25	9	2.05	24
New Jersey	42.85	7	27.97	22	11.62	8
New Mexico	33.27	23	35.28	11	-1.48	37
New York	39.14	11	41.42	7	-1.62	38
North Carolina	28.03	28	11.73	50	14.59	6
North Dakota	16.02	45	39.98	10	-17.11	51
Ohio	29.60	26	30.13	18	-0.40	34
Oklahoma	17.55	40	15.50	42	1.77	26
Oregon	15.48	46	13.21	47	2.00	25
Pennsylvania	26.34	30	25.26	27	0.86	29
Rhode Island	33.82	22	33.73	12	0.07	31
South Carolina	36.67	18	28.43	20	6.41	15

continued on next page

Table 2 (continued)
Revenue Growth, Total and Per Pupil, and Student Enrollment Growth, 1998-2006

<i>Locale</i>	<i>Total Revenue Growth (%)</i>	<i>Rank</i>	<i>Per-Pupil Revenue Growth (%)</i>	<i>Rank</i>	<i>Enrollment-Growth (%)</i>	<i>Rank</i>
South Dakota	13.83	48	32.89	14	-14.34	49
Tennessee	25.39	31	17.39	37	6.82	14
Texas	35.66	20	16.67	40	16.28	4
Utah	23.37	35	17.19	39	5.27	17
Vermont	29.36	27	41.88	5	-8.82	46
Virginia	37.65	15	25.99	26	9.25	10
Washington	16.96	41	12.35	48	4.11	19
West Virginia	8.51	51	16.45	41	-6.82	44
Wisconsin	13.86	47	14.72	46	-0.75	35
Wyoming	35.28	21	55.64	2	-13.08	48

Table 3
Relation Between Growth of Per-Pupil Revenue and Student Enrollment, by Rank, 1998-2006

		<i>Enrollment Growth</i>					
		<i>Rank</i>	<i>High 1-10</i>	<i>11-20</i>	<i>21-30</i>	<i>31-40</i>	<i>Low 41-51</i>
<i>Per-Pupil Revenue Growth</i>	<i>High 1-10</i>				Massachusetts New Hampshire New York	District of Columbia Mississippi	Hawaii Louisiana North Dakota Vermont Wyoming
	<i>11-20</i>			Arkansas Connecticut South Carolina	Maryland	Kansas Maine New Mexico Ohio Rhode Island South Dakota	
	<i>21-30</i>	New Jersey		Delaware	California Georgia Illinois Pennsylvania Virginia	Alabama	Montana Nebraska
	<i>31-40</i>	Colorado			Kentucky	Florida Indiana Iowa Minnesota Missouri Tennessee Texas Utah	
	<i>Low 41-51</i>	Arizona Nevada North Carolina		Idaho Washington	Alaska Michigan Oklahoma Oregon	Wisconsin	West Virginia

Note: This is a graphical representation of data presented in Table 2. Inflation adjustment is based on the Consumer Price Index (CPI).

Student enrollment increased in 30 states and fell in 20, as well as in the District of Columbia. The five states with the biggest increases in enrollment were Nevada (39.0%), Arizona (34.4%), Florida (16.6%), Texas (16.3%), and Georgia (16.2%). Those with the largest decreases were North Dakota (-17.1%), Louisiana (-15.7%), South Dakota (-14.3%), Wyoming (-13.1%), and Montana (-10.4%).

Examined in Table 3 is the relationship between increases in revenue per pupil and enrollment growth. In 19 states, the tradeoff between enrollment increases and per-pupil revenue growth was particularly marked. In 6 states, there were large enrollment increases and low per-pupil revenue growth, while in 13 states, there were declines or low growth in enrollment and big revenue increases.

Following the methodology of Alexander (1997), states and the District of Columbia were classified as having big increases if they were in the top two quintiles of per-pupil revenue increases or enrollment growth. Those locales in the bottom two quintiles were defined as having small increases in the corresponding categories.⁹ The quintile analysis is summarized below:

- Big increases in per-pupil revenues and decreases or small increases in enrollment: District of Columbia, Hawaii, Kansas, Louisiana, Maine, Mississippi, New Mexico, North Dakota, Ohio, Rhode Island, South Dakota, Vermont, and Wyoming.
- Small increases in per-pupil revenue and big increases in enrollment: Arizona, Colorado, Idaho, Nevada, North Carolina, and Washington.

Surprisingly, 13 states had either relatively large or small per-pupil revenue changes despite enrollment patterns that would be expected to result in changes of the opposite direction:

- Big per-pupil revenue increases despite big enrollment increases: Arkansas, Connecticut, and South Carolina.
- Small per-pupil revenue increases despite enrollment decreases or small increases: Florida, Indiana, Iowa, Minnesota, Missouri, Tennessee, Texas, Utah, Wisconsin, and West Virginia.

During much of the period analyzed, all ten states that had smaller than anticipated per-pupil revenue increases were led by governors who campaigned for small government. Their terms in office were often marked by a commitment to holding down the size of government and not raising taxes. Since schools tend to consume the largest share of a state's budget, this commitment placed significant fiscal pressures on resources devoted to schools.

Convergence of Revenue Levels

Convergence of per-pupil revenues can occur for a variety of reasons, including intergovernmental competition, educational reform efforts, and regression to the mean. Intergovernmental competition often pits states against each other in attracting business investments. Historically, states with relatively low per-pupil revenues have often been associated with poorly educated students (Gold 1990; Darling-Hammond 2007). In the previous period studied (1983-1992), state policymakers often considered that they would be better able to compete for economic investment if their educational revenues did not lag too far behind those of neighboring states or the national average. Consequently, in order to "catch up" with their more generous counterparts, initially low-spending states tended to have higher than average increases in revenues per pupil. However, this strategy has been replaced with one that tries to

attract businesses by holding taxes down. This frequently results in a reversal of roles where lower-spending states do not look toward their more generous neighbors. Rather, the opposite occurs; that is, formerly higher spending states try to keep public revenues, including those spent on education, in line with less generous states. Exceptions often include those states that have long been characterized as having high pupil revenues, whether because of having a taste for education or having relatively higher costs of living.

The convergence hypothesis can be tested by comparing per-pupil revenues in 1998 and subsequent revenue growth. This relationship is examined in Table 4 using inflation-adjusted revenue. The data reported in Table 4 generally support the hypothesis that while a catch-up phenomenon occurred, it was less significant than in the previous period. The seven states in the upper right hand corner of the table had relatively low per-pupil revenue in 1998 followed by significant increases, while the seven states in the lower left hand corner had high per-pupil revenue in 1998 but experienced low revenue growth in the subsequent eight years. In the previous study, 10 states had relatively low 1998 per-pupil revenues followed by big increases, and 12 states had high 1998 per-pupil revenues but low increases subsequently. The lack of convergence is further exemplified by the 10 states in the upper left hand corner; these had both high 1998 per-pupil revenues and high growth. The 11 states in the lower right hand corner had low 1998 per-pupil revenues followed by low growth. By contrast, in the previous study, only five states that initially had low per-pupil revenues in 1983 had low growth in the subsequent ten years. The described patterns for 1998-2006 are summarized below:

- Low per-pupil revenue and large subsequent increases: Arkansas, Louisiana, Mississippi, North Dakota, New Mexico, South Carolina, and South Dakota.
- High per-pupil revenue and small subsequent increases: Alaska, Indiana, Michigan, Minnesota, Oregon, West Virginia, and Wisconsin.
- Low per-pupil revenue and small subsequent increases: Arizona, Colorado, Florida, Idaho, Kentucky, Nevada, North Carolina, Oklahoma, Tennessee, Texas, and Utah.
- High per-pupil revenue and large subsequent increases: Connecticut, District of Columbia, Maine, Massachusetts, Maryland, New York, Ohio, Rhode Island, Vermont, and Wyoming.

Regional tendencies were still pronounced. Of the seven states with relatively low per-pupil revenues and subsequent large increases, four were in the Southeast. Of the seven states with relatively high per-pupil revenues and small subsequent increases, six were in the West or Midwest. Of the 11 states with low per-pupil revenue and small subsequent increase, seven were in the West. Of the 10 locales with relatively high per-pupil revenues and subsequent large increases, eight were in the East, primarily in New England or the Mid-Atlantic region.

The places that sparked the most concern were those states that had low 1998 per-pupil revenue and lower than average revenue growth. Those states also tended to favor market-driven approaches to funding education. For example, early in his term, in 2008, Florida Governor Scott proposed the expanded use of private school vouchers to private schools and all families, regardless of household income (Sherman 2011; Klas 2010). In a similar reliance on competition and market mechanisms to address perceived public

Table 4
Relation Between Per-Pupil Revenue Growth and 1998 Revenue per Pupil, by Rank

		Revenue Per Pupil				
Rank		High 1-10	11-20	21-30	31-40	Low 41-51
Per-Pupil Revenue Growth	High 1-10	Massachusetts New York District of Columbia	Vermont Wyoming	Hawaii New Hampshire		Louisiana Mississippi North Dakota
	11-20	Connecticut Rhode Island	Maine Maryland Ohio	Kansas	New Mexico South Carolina	Arkansas South Dakota
	21-30	Delaware New Jersey Pennsylvania		California Illinois Nebraska Virginia	Georgia Montana	Alabama
	31-40		Indiana Minnesota	Iowa Missouri	Colorado Florida Kentucky Texas	Tennessee Utah
	Low 41-51	Alaska Michigan	Oregon West Virginia Wisconsin	Washington	Nevada North Carolina	Arizona Idaho Oklahoma

Note: This is a graphical representation data presented in Tables 1 and 2. Inflation adjustment is based on the Consumer Price Index. The 1998 per pupil revenues are not adjusted for differences in the cost of living among states and the District of Columbia.

ills, Arizona policymakers advocated the increased use of charter schools (Anderson 2009). A third example is Utah. In the previous study, Utah's exceptionally high enrollment growth often made it difficult for its leaders to sustain large increases in per-pupil revenue. In the more recent period covered in this analysis, Utah's rate of growth of its student population slowed to 17th, but growth in per-pupil revenues lagged, ranking 39th in the nation.

Economic Growth and Revenue Increases

The growth of education revenues depends heavily on the health of a state's economy. It would be expected that states with strong economies would provide large increases in per-pupil revenues. In the United States, indicators of state fiscal capacity are often grounded in measures of personal income. A limitation of these measures is their inability to reflect the diversity of tax and revenue sources as well as their failure to capture the ability of states to export taxes. Notwithstanding these shortcomings, measures of personal income are often more up-to-date and more readily available than other indicators. Further, states generally do not vary significantly in their rankings among the various fiscal capacity measures, except in the case of energy-rich states like Alaska and tourist-rich states like Florida.

The growth of real personal income per pupil is a good measure of how much a state's economy expanded in relation to the growth of demand for education. Between 1998 and 2006, this measure rose 17.76% nationally, but there were wide variations across states

and the District of Columbia as indicated in Table 5. In the previous study, states in New England, the Mid-Atlantic, and the Southeast dominated the top ten rankings. In contrast, for 1998-2006, the highest rates of economic growth as measured by the change in personal income per pupil was found in Wyoming (79.68%), Montana (48.14%), South Dakota (46.43), North Dakota (44.27%), and Louisiana (44.03%). The five states with the smallest increases were largely in the Great Lakes region of the Midwest: Michigan (2.19%), Illinois (8.99%), Indiana (9.06%), New Jersey (9.41%) and Ohio (10.49%).

Table 6 examines the relationship between growth in personal income per pupil and school revenue per pupil. In general, the pattern of association between these two variables supports the notion that a strong economy leads to increased funding for schools. However, the relationship between per-pupil revenue increases and the growth of personal income per pupil is not as pronounced as that noted in Alexander (1997). For 1998-2006, ten states and the District of Columbia are in the upper left hand corner, indicating relatively big increases in personal income per pupil and per-pupil revenues. Eleven states are in the lower right corner, meaning that they had low growth in personal income per pupil and per-pupil revenues. By contrast, there are only four states in the upper right corner, representing those with small increases in personal income per pupil and large growth in per-pupil revenues. The six states located in the lower left corner experienced large increases in personal income per student and low growth in per-pupil revenues. The findings from

Table 5
Growth of Personal Income, Total and Per Pupil, and Student Enrollment, 1998-2006

Locale	Total Personal Income Growth (%)	Rank	Per-Pupil Personal Income Growth (%)	Rank	Enrollment Growth (%)	Rank
United States	25.39		17.76		6.47	
Alabama	23.60	28	24.84	17	-0.99	36
Alaska	26.87	22	25.76	15	0.88	28
Arizona	51.47	3	12.67	43	34.44	2
Arkansas	27.36	21	22.60	22	3.88	20
California	32.66	13	19.61	34	10.91	9
Colorado	35.67	8	19.55	35	13.48	7
Connecticut	21.71	33	13.26	42	7.45	12
Delaware	26.09	23	16.73	38	8.02	11
District of Columbia	43.42	4	43.86	6	-0.30	33
Florida	40.95	6	20.88	29	16.61	3
Georgia	28.74	16	10.82	46	16.17	5
Hawaii	27.44	20	32.37	10	-3.72	43
Idaho	41.15	5	31.68	11	7.19	13
Illinois	15.17	48	8.99	50	5.68	16
Indiana	14.39	49	9.06	49	4.89	18
Iowa	16.73	45	20.97	28	-3.51	42
Kansas	19.90	38	20.20	30	-0.25	32
Kentucky	18.77	43	16.93	37	1.58	27
Louisiana	21.35	37	44.03	5	-15.74	50
Maine	24.31	27	35.17	8	-8.04	45
Maryland	31.62	14	27.14	14	3.52	21
Massachusetts	22.78	31	19.89	33	2.41	22
Michigan	4.56	51	2.19	51	2.32	23
Minnesota	21.54	35	23.62	20	-1.68	39
Mississippi	21.57	34	23.99	18	-1.95	40
Missouri	18.17	44	17.26	36	0.78	30
Montana	32.70	12	48.14	2	-10.42	47
Nebraska	19.76	39	22.28	24	-2.06	41
Nevada	55.40	2	11.77	44	39.03	1
New Hampshire	25.99	24	23.46	21	2.05	24
New Jersey	22.13	32	9.41	48	11.62	8
New Mexico	32.87	11	34.86	9	-1.48	37
New York	19.17	41	21.13	26	-1.62	38
North Carolina	27.70	18	11.44	45	14.59	6
North Dakota	19.59	40	44.27	4	-17.11	51
Ohio	10.05	50	10.49	47	-0.40	34
Oklahoma	31.35	15	29.06	13	1.77	26
Oregon	23.48	29	21.06	27	2.00	25
Pennsylvania	15.61	47	14.63	40	0.86	29
Rhode Island	21.45	36	21.37	25	0.07	31
South Carolina	27.90	17	20.19	31	6.41	15

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Table 5 (continued)
Growth of Personal Income, Total and Per Pupil, and Student Enrollment, 1998-2006

Locale	Total Personal Growth (%)	Rank	Per-Pupil Personal Income Growth (%)	Rank	Enrollment Growth (%)	Rank
South Dakota	25.43	25	46.43	3	-14.34	49
Tennessee	23.22	30	15.36	39	6.82	14
Texas	33.02	10	14.40	41	16.28	4
Utah	38.46	7	31.52	12	5.27	17
Vermont	25.29	26	37.40	7	-8.82	46
Virginia	35.32	9	23.86	19	9.25	10
Washington	27.58	19	22.54	23	4.11	19
West Virginia	16.59	46	25.12	16	-6.82	44
Wisconsin	19.05	42	19.95	32	-0.75	35
Wyoming	56.17	1	79.68	1	-13.08	48

Table 6
Relation between Growth in Per-Pupil Revenues and Per-Pupil Personal Income, by Rank, 1998-2006

		Per-Pupil Personal Income Growth					
		Rank	High 1-10	11-20	21-30	31-40	Low 41-51
Per-Pupil Revenue Growth	High 1-10	Hawaii Wyoming Louisiana Vermont District of Columbia North Dakota	Mississippi	New Hampshire New York	Massachusetts		
	11-20	Maine New Mexico South Dakota	Maryland	Rhode Island Arkansas Kansas	South Carolina	Connecticut Ohio	
	21-30	Montana	Alabama Virginia	Nebraska	California Delaware Pennsylvania	Georgia Illinois New Jersey	
	31-40		Minnesota Utah	Florida Iowa	Colorado Kentucky Missouri Tennessee	Indiana Texas	
	Low 41-51		Alaska Idaho Oklahoma West Virginia	Oregon Washington	Wisconsin	Arizona Michigan Nevada North Carolina	

Table 6 can be summarized, as follows:

- Big increases in personal income per pupil and per-pupil revenue: District of Columbia, Hawaii, Louisiana, Maine, Maryland, Mississippi, New Mexico, North Dakota, South Dakota, Vermont, and Wyoming.
- Small increases in personal income per pupil and per-pupil revenue: Arizona, Colorado, Indiana, Kentucky,

Michigan, Missouri, Nevada, North Carolina, Tennessee, Texas, and Wisconsin.

- Small increases in personal income per pupil and big increases in per-pupil revenue: Connecticut, Massachusetts, Ohio, and South Carolina.
- Large increases in personal income per pupil and small increases in per-pupil revenue: Alaska, Idaho, Minnesota, Oklahoma, Utah, and West Virginia.

Table 7
Correlation Matrix: 1998 Per-Pupil Revenue and Growth in Per-Pupil Personal Income, Per-Pupil Revenue, and Student Enrollment 1998-2006

	<i>Per-Pupil Revenue</i>	<i>Per-Pupil Personal Income Growth</i>	<i>Enrollment Growth</i>	<i>Per-Pupil Revenue Growth</i>
Per-Pupil Revenues	1.0000			
Per-Pupil Personal Income Growth	-0.1698	1.0000		
Enrollment Growth	-0.0429	-0.6273	1.0000	
Per-Pupil Revenue Growth	0.0927	0.5127	-0.4652	1.0000

Table 8
Per-Pupil Revenue Changes and the Joint Associations of Personal Income per Pupil Growth, Enrollment Growth, and Per-Pupil Revenue

<i>Variables</i>	<i>Unstandardized Coefficient (Standard Error)</i>	<i>T-Ratio</i>	<i>Mean</i>	<i>Standard Deviation</i>
Constant	7.0753 (10.8415)	.6526		
Personal Income per Pupil Growth	0.4161* (.1604)	2.5936	24.00	13.15
Enrollment Growth	-0.2501 (.1984)	-1.2605	2.89	10.48
Per-Pupil Revenue	0.0016 (0.0013)	1.2409	6,965.50	1,297.00
R-Squared	0.3191			
Adjusted R Squared	0.2757			
Degrees of Freedom	3, 47			

Note: Asterisk (*) indicates coefficient is statistically significant at the 0.05 level.

Surveyors of the education landscape need to focus on those states that had large increases in personal income per pupil but small increases in per-pupil revenues. In the past, faster growing economies were often associated with more investment in elementary and secondary education. As such, more recent trends suggest changing public policy priorities. Alexander (2011) saw similar patterns in her examination of the evolution of changing political cultures in Minnesota over the past two decades, 1990 through 2010.

Revenue Increases and the Joint Association of Key Variables

Table 7 shows the correlation between 1998 per-pupil revenues and growth in personal income per pupil, student enrollment, and per-pupil revenues. Per-pupil revenue growth was most strongly correlated with personal income growth per pupil (0.5127). However, it was negatively correlated with enrollment growth (-0.4642).

Even after looking at the descriptive relationships and correlations, questions remain regarding the independent role of any one of these factors with regard to the growth of educational revenues. Using a regression model, this study addressed this issue by exploring the relationship between increases in school funding (PPR) and the

following three variables: enrollment growth (ENRL), increases in personal income per pupil (PIPP), and real 1998 funding levels (PPR98):

$$PPR = \alpha + \beta_1 ENRL + \beta_2 PIPP + \beta_3 PPR98 + e$$

where e is the error term.

The results of the regression analysis are shown in Table 8. The model accounted for 31.9% of the variation in the growth of per-pupil school revenues, 1998-2006. As suggested by the earlier findings, the sign of the coefficient for 1998 per pupil revenue was positive. However, the coefficient (0.0016) was not statistically significant. The positive, statistically significant coefficient for strength of the economy as measured by per-pupil personal income growth (0.4161) was as expected. Specifically, for each 10% increase in the growth of per-pupil personal income, per pupil education revenues rose by 4.2%, holding other variables constant. The negative coefficient sign bore out the expected impact of enrollment increases, although the coefficient (-0.2501), was not statistically significant.

Table 9
Per-Pupil Revenue Growth, Total and by Source, Sorted by Total Per-Pupil Revenue Growth

<i>Locale</i>	<i>Total (%)</i>	<i>Rank</i>	<i>Federal (%)</i>	<i>Rank</i>	<i>State (%)</i>	<i>Rank</i>	<i>Local (%)</i>	<i>Rank</i>
Hawaii	87.6	1	79.7	16	89.7	3	249.9	1
Wyoming	56.6	2	135.6	2	46.8	8	56.0	3
Louisiana	55.0	3	154.4	1	33.3	13	61.1	2
Mississippi	50.5	4	121.4	4	38.7	10	42.6	8
New York	41.5	5	88.0	10	51.2	7	30.1	23
North Dakota	39.2	6	77.7	18	22.8	25	46.6	7
New Mexico	38.0	7	51.0	45	36.1	12	42.0	10
Massachusetts	37.5	8	53.2	39	58.7	5	19.4	41
South Dakota	37.5	9	126.6	3	27.7	19	27.0	27
Vermont	36.6	10	98.7	6	297.5	2	-88.7	51
New Hampshire	36.3	11	97.8	7	471.2	1	-14.1	49
District of Columbia	36.1	12	1.0	51	n.a.		42.4	9
Arkansas	33.4	13	40.0	47	31.4	15	46.6	6
Maine	32.6	14	86.9	12	23.3	23	31.3	20
Kansas	32.3	15	101.1	5	24.7	22	34.3	17
New Jersey	31.6	16	59.8	32	39.9	9	24.0	32
Ohio	30.7	17	70.5	25	38.4	11	21.6	37
Alabama	30.5	18	66.3	29	16.8	29	54.7	4
Rhode Island	29.8	19	83.0	15	32.8	14	22.6	36
Maryland	29.8	20	54.0	38	30.7	16	27.3	26
South Carolina	29.7	21	55.7	34	13.9	35	49.2	5
Georgia	29.0	22	74.6	21	11.9	36	39.5	11
Montana	27.8	23	75.5	20	25.9	21	18.3	43
Pennsylvania	27.7	24	76.9	19	16.9	28	30.1	24
Connecticut	26.7	25	55.2	35	30.6	17	24.7	31
Nebraska	26.5	26	90.1	9	21.6	26	23.5	34
Delaware	25.2	27	36.7	48	23.0	24	28.2	25
Kentucky	25.1	28	52.8	41	16.1	31	37.7	13
Illinois	23.6	29	53.1	40	28.9	18	18.8	42
California	23.3	30	62.8	31	21.5	27	16.7	44
Alaska	22.0	31	68.9	27	15.2	32	23.6	33
Missouri	22.0	32	74.0	22	2.8	44	31.0	22
Iowa	20.8	33	95.9	8	7.4	39	35.9	15
West Virginia	20.6	34	57.2	33	15.0	33	22.7	35
Virginia	20.4	35	54.5	36	52.0	6	3.4	47
Utah	19.5	36	65.4	30	8.0	38	33.9	18
Tennessee	19.4	37	51.0	46	6.3	40	32.4	19
Indiana	19.3	38	69.7	26	14.0	34	20.8	39
Texas	19.1	39	87.7	11	-8.8	50	35.2	16
Colorado	19.0	40	71.2	24	16.5	30	15.3	45
Oklahoma	19.0	41	84.0	14	3.0	43	38.6	12
Nevada	18.6	42	84.7	13	-3.3	48	25.5	30

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Table 9 (continued)
Per-Pupil Revenue Growth, Total and by Source, Sorted by Total Per-Pupil Revenue Growth

Locale	Total (%)	Rank	Federal (%)	Rank	State (%)	Rank	Local (%)	Rank
Minnesota	16.9	43	54.3	37	59.0	4	-42.5	50
Arizona	16.0	44	33.9	50	26.7	20	0.1	48
Idaho	16.0	45	78.2	17	4.1	42	26.7	28
Florida	15.0	46	51.7	43	-7.0	49	36.4	14
Oregon	14.0	47	73.8	23	1.3	45	26.0	29
Wisconsin	12.9	48	51.7	43	-7.0	49	36.4	14
North Carolina	12.7	49	67.6	28	4.8	41	20.9	38
Michigan	8.6	50	34.6	49	-2.4	47	31.0	21
Washington	8.3	51	51.8	42	-0.2	46	20.1	40

Note: n.a. = not applicable.

Source of Revenues

The fourth issue considered in this updated analysis is somewhat different from those discussed above, but mirrors the analysis offered in Alexander (1997). This discussion of the contribution of the different jurisdictions differs from the earlier analysis in its inclusion of federal contributions, its adjustment for inflation and wage differentials, as well as the inclusion the District of Columbia in the analysis. While the initial portions contributed by each source would not be affected by wage differentials, the growth in these contributions might vary depending on changes in a locale's economy. The rest of this section provides a comprehensive analysis of where the money came from – was it mainly from the federal, state, or local government? Which of these provided the bulk of the increased funding for locales with particularly large or small revenue increases?

The growth of real total per-pupil revenue as well as that of federal, state, and local governments is shown in Table 9. It is organized by the ranking of the states with respect to total per-pupil revenue growth so that trends in those locales with particularly large or small per-pupil growth can readily be seen. In this discussion, states that ranked in the top 15 of per-pupil revenue increases were considered to have particularly large growth. Similarly, those states in the bottom 15 were considered to have particularly small growth.

In most locales with big revenue increases, growth in federal funding exceeded growth from state and local sources. This is not surprising since the federal share of per-pupil revenues increased from 6.8% in 1998 to 9.1% in 2006. In only three of the states with large per-pupil revenue increases did growth in state revenues outpace that of the federal government: Massachusetts, New Hampshire, and Vermont. Arkansas and Hawaii were the only two fast-growing states in which school revenues from local contributions grew faster than the growth in contributions from federal and state sources.

If we look only at the growth in state and local contributions, local governmental units provided the bulk of additional funding. In 9 of the 15 states with big per-pupil revenue increases, growth in local pupil revenues outpaced increases in state aid by an average of 9.6 percentage points. In five of the remaining states with big per-pupil revenue increases, state revenues outpaced local funding

by an average of 39.3 percentage points. In South Dakota, the pace of growth of per-pupil revenues coming from state or local sources was fairly even.

In 12 states with particularly low per-pupil revenue growth, the local governmental unit provided the bulk of additional funding, averaging 24.8 percentage points more than state per-pupil revenue increases: Florida, Idaho, Indiana, Michigan, Nevada, North Carolina, Oregon, Tennessee, Texas, Oklahoma, Washington, and Wisconsin. Three states with the smallest revenue increases—Arizona, Colorado, and Minnesota—relied primarily on increases in state per-pupil revenues, which outpaced the growth of local educational funding by an average of 26.5 percentage points.

The remaining states had moderate growth in per-pupil revenues, ranging from 19.5% in Utah to 30.7% in Ohio. All states with moderate growth saw their largest increases come from the federal government. When only state and local contributions were considered, the smallest growth in 12 of the 20 states came from state coffers: Alabama, Alaska, Delaware, Georgia, Iowa, Kentucky, Missouri, Nebraska, Pennsylvania, South Carolina, Utah, and West Virginia. In eight of the states with moderate growth, state contributions outpaced those from the local governmental units: California, Connecticut, Illinois, Maryland, Montana, Ohio, Rhode Island, and Virginia.

These findings on state and local contributions suggest that states were pulling back on per-pupil revenue increases relative to the earlier period studied. In the past, those states with particularly small increases in per-pupil revenues tended to receive more of their additional funding from the state, rather than local governments. Here, all three groups of states, i.e., those with high, moderate, and low rates of per-pupil revenue growth, saw the bulk of their additional funding come from federal and local sources.

Adequacy across the States

In school finance discourse, discussions of adequacy have often been framed as the level of funding that allows all children, or at least a suitable portion of them, to meet the education standards set by federal and state guidelines; that is, adequacy measures how much of an appropriate educational outcome policymakers can achieve with the resources available. Capturing adequacy is a growing concern among many educators and has been the center

of education discourse on developing appropriate school finance mechanisms and formulas. Currently, four approaches have emerged from leaders in education finance on an appropriate working definition of adequacy:

- ◆ Professional judgment (Guthrie 1983)
- ◆ Successful schools (Odden 2000)
- ◆ Cost function (Reschovsky and Imazeki 2001)
- ◆ State-of-the-art methodology (Odden, Fermanich, and Picus (2003) ¹⁰

More recently, Alexander and Schapiro (2009) have argued for the creation of an “adequacy condition index” in the same way that we have indicators of fiscal condition.¹¹ The search for adequacy is not only a quest for greater effectiveness, but also a pursuit for greater equity.

Using an evidence-based approach developed by Odden, Goetz, and Picus (2010), a comparison was made between per-pupil revenues and a prescribed adequacy level of \$9,391.¹² This comparison is appropriate because Odden et al.’s prescribed level is based on 2006 figures. However, because the national average masks large regional cost differentials across states, the proposed level of adequacy and 2006 per-pupil revenues are compared here using both nominal per-pupil revenues and dollars adjusted for cost of living differences. Adjusting for differences in purchasing power is essential. For those states where costs are higher, the funding needed to purchase an adequate level of education resources would be higher than Odden et al.’s prescribed amount. On the other hand, for those states where costs are lower, adequate funding would be lower than the prescribed amount. Table 10 lists the difference between 2006 per-pupil revenues, nominal and adjusted for regional price differences, for the states and the District and Columbia and Odden et al.’s prescribed adequacy level of \$9,391. When regional price differences are not accounted for, 15 states are below the prescribed level of per-pupil revenues, ranging from \$69 below in Colorado to \$2,622 below in Utah. Once regional price differences are accounted for, only nine states are below the prescribed level, and the gap narrowed, ranging from \$286 below in Oklahoma to \$2,003 below in Utah. California and Washington are the only states whose per pupil revenues are considered adequate before cost of living differences are accounted for, but are considered inadequate once price differentials are calculated. The findings from Table 10 can be summarized as follows:

- States falling below an adequate funding level using nominal per-pupil revenues: Alabama, Arizona, Arkansas, Colorado, Florida, Idaho, Kentucky, Mississippi, Nevada, North Carolina, Oklahoma, South Dakota, Tennessee, Texas, and Utah.
- States falling below an adequate funding level using nominal per-pupil revenues adjusted for regional price differences: Arizona, California, Idaho, Nevada, North Carolina, Oklahoma, Tennessee, Texas, Utah, and Washington.

Policy Implications and Conclusions

Patterns of school revenue growth between 1998 and 2006 have changed since the earlier period studied by the author, 1983-1992, with some of the earlier slowing trends becoming more pronounced. The period of 1998 through 2006 was particularly difficult for states. After brief recoveries from two national economic

recessions in the 1980s, states were then faced with shrinking fiscal resources from economic recessions in the early 1990s and early 2000s (National Bureau of Economic Research 2011). Like the decade before, the more recent period saw only slow to modest economic growth where total personal income grew on average by 25.4%, while personal income per pupil grew more slowly, at 17.8%. As before, those states experiencing large student enrollment increases while battling a declining economy were especially hard-pressed. Some states, like Louisiana, were able to rise in the rankings of per-pupil revenue growth only because of precipitous declines in student enrollment coupled with large infusions of federal dollars.

In the 1980s, the pressure to improve student achievement was very strong in the wake of the report, *A Nation at Risk* (National Commission on Excellence in Education 1983). In the decades following, the challenges facing schools intensified with the signing of the No Child Left Behind Act of 2001. No state was immune to the dual pressures of increasingly punitive accountability measures and greater noneducational demands being placed on its resources. The response of state policymakers to these rising pressures also changed. Previously, when state policymakers were faced with the potentially conflicting alternatives of improving schools and reducing public expenditures, they typically increased school funding. However, in the more recent period studied here, many chose to reduce the growth of school revenues and adopted more market-driven models to achieve school improvement.

The period 1998 through 2006 was characterized by the growing importance of the federal government as it related to the funding of schools. While state and local governments combined typically provided 90% of school funding, many of the additional resources came from federal coffers. Indeed, for many locales, there was a marked decline in the role that the state played in raising revenues for schools. In most instances, those states that had the largest revenue increases in per-pupil funding saw the greatest growth coming from the federal government.

States with weak economies generally could not afford large increases in per-pupil revenues. While weak economies generally translated into low growth in per-pupil funding, strong state economies were no longer guarantees of increased investment in public schools. Large increases in personal income per pupil were no longer substantively associated with large increases in per-pupil revenues. In the past, states sought to “catch up” if their school revenues lagged behind those of neighboring states or the national average, but, more recently, policymakers have touted lower public spending, including funds spent on schools, as illustrative of economic competitiveness. In this study, key exceptions included Connecticut, Massachusetts, Ohio, and South Carolina, states that managed to substantially increase per-pupil revenues despite relatively low economic growth as measured by personal income per pupil. The weaker connections between economic growth and subsequent investment in schools suggested that as demand grew for a more skilled workforce, education funds to support these new requirements may have been insufficient.

This pattern is consistent with the observation of Mitchell and Mitchell (2003) that state policymakers tend to view education as a durable product. To that end, the purpose of education is to create better workers that can, in turn, improve the economy and stimulate economic growth. According to Mitchell and Mitchell, if public

Table 10
Per-Pupil Revenue, 2006, Compared to the Prescribed Adequacy Level of \$9,391

Locale	Per-Pupil Revenue Unadjusted for Regional Price Differences (\$)	Difference from Prescribed Adequacy Level (\$)	Per-Pupil Revenue Adjusted for Regional Price Differences (\$)	Difference from Prescribed Adequacy Level (\$)
United States	10,601			
Alabama	8,555	-836	9,764	373
Alaska	12,849	3,458	13,536	4,145
Arizona	8,071	-1,320	8,810	-581
Arkansas	9,031	-360	10,971	1,580
California	9,909	518	9,037	-354
Colorado	9,322	-69	9,718	327
Connecticut	15,149	5,758	13,774	4,383
Delaware	12,679	3,288	12,466	3,075
District of Columbia	15,624	6,233	12,717	3,326
Florida	9,277	-114	10,020	629
Georgia	10,083	692	10,269	878
Hawaii	14,789	5,398	15,612	6,221
Idaho	7,289	-2,102	9,052	-339
Illinois	10,581	1,190	10,251	860
Indiana	10,831	1,440	12,195	2,804
Iowa	9,793	402	11,694	2,303
Kansas	10,555	1,164	12,474	3,083
Kentucky	8,693	-698	9,840	449
Louisiana	10,329	938	11,912	2,521
Maine	12,134	2,743	14,533	5,142
Maryland	12,419	3,028	11,485	2,094
Massachusetts	14,251	4,860	13,096	3,705
Michigan	10,893	1,502	11,157	1,766
Minnesota	10,952	1,561	11,331	1,940
Mississippi	8,349	-1,042	10,051	660
Missouri	9,707	316	10,731	1,340
Montana	9,439	48	12,759	3,368
Nebraska	10,368	977	12,258	2,867
Nevada	8,965	-426	9,010	-381
New Hampshire	11,489	2,098	12,343	2,952
New Jersey	16,337	6,946	14,462	5,071
New Mexico	9,636	245	10,987	1,596
New York	16,613	7,222	14,850	5,459
North Carolina	7,863	-1,528	8,330	-1,061
North Dakota	9,748	357	12,158	2,767
Ohio	11,473	2,082	11,979	2,588
Oklahoma	7,656	-1,735	9,105	-286
Oregon	9,829	438	10,756	1,365
Pennsylvania	12,391	3,000	13,002	3,611
Rhode Island	13,342	3,951	13,205	3,814

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Table 10 (continued)
Per-Pupil Revenue, 2006, Compared to the Prescribed Adequacy Level of \$9,391

<i>Locale</i>	<i>Per-Pupil Revenue Unadjusted for Regional Price Differences (\$)</i>	<i>Difference from Prescribed Adequacy Level (\$)</i>	<i>Per-Pupil Revenue Adjusted for Regional Price Differences (\$)</i>	<i>Difference from Prescribed Adequacy Level (\$)</i>
South Carolina	9,559	168	10,605	1,214
South Dakota	8,967	-424	11,789	2,398
Tennessee	7,660	-1,731	8,334	-1,057
Texas	8,771	-620	8,865	-526
Utah	6,769	-2,622	7,388	-2,003
Vermont	13,958	4,567	16,502	7,111
Virginia	10,648	1,257	9,836	445
Washington	9,457	66	9,107	-284
West Virginia	10,364	973	12,241	2,850
Wisconsin	11,114	1,723	11,711	2,320
Wyoming	13,614	4,223	16,816	7,425

investment in education is primarily a means to achieve economic growth, state policymakers may decide that there are more cost-effective options to improve the economy. This calculus was apparent in the emerging patterns of per-pupil revenue growth in this study. As globalization calls for a more skilled workforce, computers and other technology facilitate the transfer and portability of resources and knowledge (Friedman 2007). It is ironic that this portable knowledge has led some state policymakers to conclude that reductions in public expenditures and tax cuts to be better economic investments than additional investments in schools.

The question of what is the appropriate level of education investment that is needed to achieve desired educational outcomes is the focus of adequacy. Odden et al. (2010, 142) defined educational adequacy as most students achieving high standards, and asserted that "...the national average expenditure per pupil comes very close to funding adequacy." However, this study demonstrated that variations in costs, based upon inflation and differences in regional prices, matter and may have profound implications for the level of per-pupil revenues needed to achieve adequacy.

Variations in cost of living and the political culture of states will likely influence whether or not state policymakers consider more education investment a rational decision. Given the present political and economic climate, it is unlikely that those states with inadequate per-pupil revenues in 2006 will garner the political will to achieve adequate funding as defined in this study. By and large, those states with inadequate per-pupil revenues in 2006 tended to have low per-pupil revenues in 1998 and had slower than average revenue growth over the intervening eight years. In many instances, the low growth rate in per-pupil revenues was associated with higher than average rates of growth in enrollment. These patterns were troubling because they suggested that an increasing number of school children would be served in states where investment in education was inadequate.

Endnotes

¹ This time span will be referred to as 1998-2006.

² Contemporary educational finance research suggests that the field continues to focus intently on educational adequacy. One strand of that research uses an evidence-based approach to establish the appropriate levels of expenditure to get the student outcomes sought by policymakers. Recent research suggests that state educational systems can produce adequate outcomes by spending what they typically do right now.

³ With regard to the CCD, NCES annually collects information on the population of public elementary and secondary schools in the United States from the administrative and fiscal records of state departments of education. Each year, states report to NCES the revenues their local education agencies receive from local, intermediate, state and federal sources. Also, it should be noted that NCES data have both advantages and disadvantages. A major advantage is the soundness of the information since it is subject to rigorous scrutiny by NCES. However, the reliability of the data comes at the cost of having up-to-date data. Another limitation is that these data exclude state contributions to teacher pensions, a major source of state support for education.

⁴ Previous studies have noted variations in how states calculate and report average daily attendance. See, e.g., Orland (1988).

⁵ The terms "real" and "inflation-adjusted" are used interchangeably throughout the article.

⁶ Note, however, that if the IPD were used, the real changes in school revenues would be different from that shown in this analysis, i.e., real revenue increases would be smaller, and real revenue decreases would be higher.

⁷ The CWI is a measure of the systematic, regional variations in the salaries of college graduates who are not educators. The underlying assumption of this index is that general differences in wages of professionals faced by the state as a whole will be the same as those faced by education organizations. The use of the CWI differs from that of Alexander (1997), which relied on Nelson

(1991) adjustments to address differences in prices among states. One benefit of the CWI is that it provides up-to-date information on price variations for the time period studied while the Nelson index covered only 1989. Having an index that covered the appropriate year was important because the past decade saw considerable variation in the relative price levels among states.

⁸ The decline in student enrollments allowed Louisiana to compensate for low growth in total education revenues. This sharp decline in the number of students can be attributed in part to Hurricane Katrina, which severely damaged New Orleans and surrounding parishes in August 2005.

⁹ This method of classifying states is maintained in the discussions of changes in revenue per pupil and personal income per student from 1998 to 2006.

¹⁰ "State-of-the-art methodology" as used here is synonymous with evidence-based approaches that rely heavily on research evidence and best practices to frame their recommendations. They often identify school-level programs and educational strategies that are associated with improved student learning in the literature. Moreover, this methodology offers a specific set of strategies for different educational organizations based on prototypical characteristics of its culture, governance, administrative, and organizational structure. A good example of this method of calculating an adequate level of funding is offered by Odden, Fermanich, and Picus (2003).

¹¹ An adequacy condition index is a series of indicators that documents and estimates appropriately the public and private expenditures aimed at improving outcomes for children. Alexander and Schapiro (2009) used the term "adequacy analysis" similarly to "indicator analysis," a term coined by Groves, Godsey, and Shulman (1981) in describing the financial or fiscal condition of an organization. Groves et al. used indicator analysis to document the trends in key financial, demographic, and economic ratios to assess the fiscal health of an organization. Alexander and Schapiro took some liberties with the term "adequacy." They did not use it in a way often found in education law suits, i.e., establishing a financial minimum associated with reaching a passing score on a standardized test. Rather, they viewed adequacy as a function of a mix of measures of how a community meets the needs of its young. The data proposed for the educational adequacy analysis are mixed with appropriate economic and demographic data, creating a series of indicators that, when plotted over a period of time, can be used to monitor changes in the conditions affecting the cost of providing educational adequacy. Again, it must be emphasized that they were not measuring the adequacy of environmental factors, per se. Rather, they were looking at the intersection of these factors and what facilitates adequate educational outcomes. Alexander and Schapiro used an excerpt from the analysis offered by Groves, et al. on the fiscal condition of local governments to identify six factors that can influence the cost of adequate levels of funding in different communities: (1) budget levels; (2) funding patterns; (3) community needs; (4) external economic conditions; (5) political culture; and (6) children outcomes. For each of these six factors, Alexander and Schapiro developed indicators that may be categorized into three groupings, where appropriate: (1) school-based components; (2) governmental, non-school based components; and (3) not-for-profit based components.

¹² Odden et al. (2010, 156) defined adequacy broadly as the level of funding that creates "...effective and efficient school systems – systems that produce the levels of student achievement that the country needs if it is to remain competitive in the emerging global economy and for each student to be successful in his or her adult life." To calculate what that amount is, they costed out key core education strategies, including small class sizes of about 15 in grades K-3, extensive teacher professional development, development of tailored instruction and formative assessments, use of extra-help strategies, where needed, and the creation of a collaborative professional school culture. With these core recommendations as the foundation of their analysis, they developed a prototypical district comprised of schools reflecting the national average in terms of enrollment size and makeup. The cost of providing adequate funding was based on national average salary data and a defined group of benefits for the personnel resources deemed necessary, as well as the average national costs for instructional materials, technology, professional development and other key educational inputs. By their calculations, general education resources resulted in school level costs of \$5,851 per pupil. When extra help resources and district office resources, including transportation, was added to the analysis, the total costs per pupil was calculated to be \$9,391, on average, in 2006.

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