PART 11: (CONTINUED)

EVALUATION OF MISSOURI SCHOOL FINANCE

1.0 Evaluation of Historical Revenues and Expenditures

This goal of this Section is to provide a rigorous statistical evaluation of the relative effectiveness of the present Missouri state school finance formula. That effectiveness can be measured in a number of ways. In this section we focus on growth, stability, equity and neutrality. We begin in Section 1.1 with a series of comparisons of revenue and expenditure per pupil trends for Missouri K-12 school districts compared with national averages over the period from 1992 through 2001. One sign of a functional school finance system is that the system can keep pace with increases in the costs of providing educational services. We use U.S. Census bureau data for these comparisons. Next, in Section 1.2 we use both U.S. Census fiscal survey of governments data and Missouri Department of Elementary and Secondary Education data to compute and analyze standard indices of educational resource equity from 1992 – 2001 (Census revenue and expenditure data) and from 1994 to 2003 (DESE revenue and expenditure data). Finally, in Section 1.3 we explore a variety of underlying correlates of revenues and expenditures in Missouri school districts, taking advantage of Census 2000 demographic and economic data.

1.1 General Trends in Revenues and Expenditures

Table 1 provides a breakout of the numbers of K-8, K12, and special school districts in Missouri and the numbers of pupils attending each type of district as recorded in the U.S. Census Fiscal Survey of Local Governments – Public Elementary and Secondary Education Finances (F-33). We focus our analyses herein on K-12 unified school districts, especially where national comparisons are concerned. In some cases, on Missouri specific analyses we provide comparisons of K-8 and K-12 districts. Note that while 14% of Missouri districts are K-8 districts, those districts serve only about 1.3% of Missouri schoolchildren.

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Table 1
Distribution of Missouri LEAs in Census Sample

	Agencies				Students			
year	k-8	k-12	Special	Total	k-8	k-12	Special	Total
1992	89	453	-	542	11,910	813,134	-	825,044
1993	86	450	2	538	11,907	822,729	-	834,636
1994	84	449	2	535	11,900	834,290	6,134	852,324
1995	78	449	2	529	11,882	844,197	6,426	862,505
1996	74	449	2	525	11,906	855,278	6,683	873,867
1997	74	448	3	525	12,538	879,820	7,392	899,750
1998	74	448	3	525	12,710	888,958	7,773	909,441
1999	73	449	3	525	11,963	891,724	7,876	911,563
2000	73	449	2	524	11,762	894,304	7,451	913,517
2001	73	449	2	524	11,809	892,433	7,431	911,673

Source: U.S. Bureau of the Census, Fiscal Survey of Local Governments, Public Elementary and Secondary School Finances

For our analyses, we use the following measures of educational resources derived from the U.S. Census fiscal survey:

1. Current instructional expenditures per pupil[1] **(Current Instruction - Census)**

2. Current expenditures per pupil[2] **(Current Expend – Census)**

3. State and local revenue per pupil less state revenues for special education students, per pupil[3] and less capital outlay expenses per pupil.[4] **(General Revenue – Census)**

We also use the following measures of educational resources derived from data from the Missouri Department of Elementary and Secondary Education (DESE):

1. Current expenditures per enrolled pupil **(Current Expend per Pupil – DESE)**

2. Current expenditures per pupil in Average Daily Attendance **(Current Expend per ADA – DESE)**

3. Formula Revenues (District Entitlement [line 1a + line 1b] + At Risk [line 14a + line 14b]) per Payment Eligible Pupil **(General Revenue – DESE)**

When evaluating the efficacy of a state school finance formula, we prefer to evaluate measures of state and local general revenues rather than current expenditures. The state's first obligation (depending on constitutional phrasing and interpretation) is to ensure that districts have sufficient general revenue to operate adequate and/or equitable general educational programs. The state may then put into place accountability mechanisms to either enforce or stimulate efficient district level management and expenditure of those resources. While district expenditures per pupil are likely highly related to district revenues per pupil, we prefer to avoid the idiosyncratic variations that might be caused by factors like districts' decisions to carry different fund balances.

Where federal data are concerned, for our state and local revenue measure, we attempt to exclude revenues for special education programs and local revenues targeted to capital-outlay projects, in order to isolate revenues available for general instruction, instructional support, administrative and general operations and maintenance purposes.[5]

Table 2 provides the correlations among DESE and U.S. Census Bureau resource measures for K-12 districts in Missouri. Note that Census current expenditure and DESE current expenditure data are highly correlated (.98). The Census state and local revenue measure is also relatively highly correlated with DESE foundation formula revenue estimates (.92), DESE current expenditure measures (.90 to .91), and with Census current expenditure measures (.91). Census current instructional expenditures are less highly correlated with Census or DESE revenue measures, but relatively highly correlated with DESE current expenditure measures. Note that instructional spending measures reflect the greatest variance in both actual district resource allocation practices, and in reporting what constitutes and instructional expense (despite relatively specific guidelines on the fiscal survey).

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[1] Current expenditures for activities directly associated with the interaction between teachers and students. These include teacher salaries and benefits, supplies (e.g., textbooks), and purchased instructional services. www.nces.ed.gov/edfin

[2] For the day-to-day operation of schools. They include all expenditures except those associated with repaying debts, capital outlays (e.g., purchases of land, school construction and repair, and equipment), and programs outside the scope of preschool to grade 12, such as adult education, community colleges, and community services. Expenditures for items lasting more than one year (e.g., school buses and computers) are not included in current expenditures. www.nces.ed.gov/edfin

[3] variable C05 subtracted

[4] variable tcapout subtracted

[5] We are unable with the Census fiscal survey to disaggregate local property tax revenues. As a result, we subtract capital outlay expenditures instead, on the assumption that most capital outlay expenditures paid for from local property tax revenues were paid for from dedicated taxes. This may result in overstatement of capital outlay.

Table 2

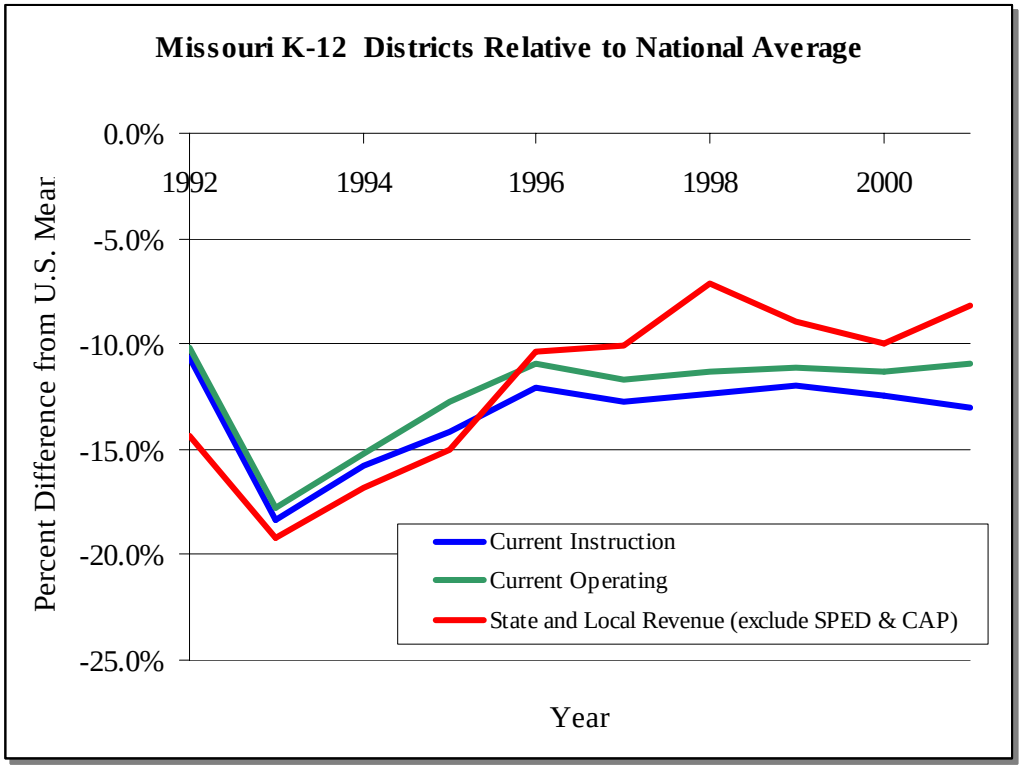
Correlations among Resource Measures (2000 – 2001, K-12 Districts)

	General Revenue (Census)	*Current Expenditure (Census)*	*Current Instruction (Census)*	*Current Expenditure per ADA (DESE)*	*Current Expenditure per Pupil (DESE)*	*General Revenue (DESE)*
General Revenue (Census)	1.000					
Current Expenditure (Census)	0.906	1.000				
Current Instruction (Census)	0.765	0.906	1.000			
Current Expenditure per ADA (DESE)	0.901	0.981	0.856	1.000		
Current Expenditure per Pupil (DESE)	0.909	0.986	0.867	0.990	1.000	
General Revenue (DESE)	0.924	0.883	0.717	0.920	0.905	1.000

Analyses weighted by district enrollment

Figure 1 compares Missouri current instructional spending, current expenditures and state and local revenues per pupil to national averages on the same measures from 1992 to 2001. Values are expressed in terms of Missouri data as a percent of National (excluding Missouri). On all measures there appears to be a "blip" on the screen from 1992 to 1993 which may be a function of changes in reporting. Since 1993, however, all measures have climbed steadily from 15 to 20% below national averages to around 10 or 10 to 15% below. Note that no regional cost adjustments were employed. As such, if Missouri costs of doing business are lower than the national average, it might be reasonable for Missouri educational expenditures to be lower. Of primary interest in this and later figures is the trend over time, which appears to be generally positive, or at least relatively stable through the late 1990s.

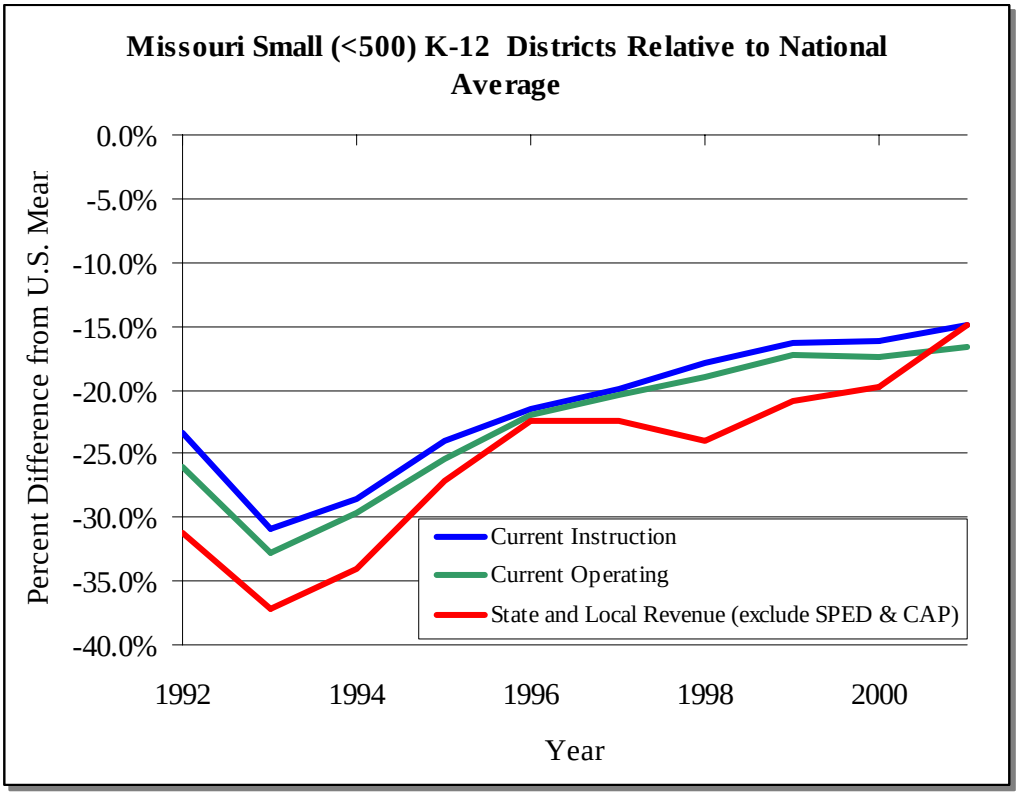
Figure 1



Data Source: U.S. Census Fiscal Survey

Figure **2** compares on the same measures, Missouri's small K-12 school districts with small school districts nationally, where small is defined as enrolling under 500 pupils. This figure shows consistent growth, relative to national trends, in expenditures and revenues. Missouri small districts started the period over 30% behind their peers nationally. By 2001, that gap had been cut in half.

Figure 2



Data Source: U.S. Census Fiscal Survey

Figure 3 shows a very similar trend for districts with 1,000 to 2,000 pupils. Like smaller districts, these districts have gained substantial ground on their peers of similar size nationally. However, they remain significantly behind.

Figure 3

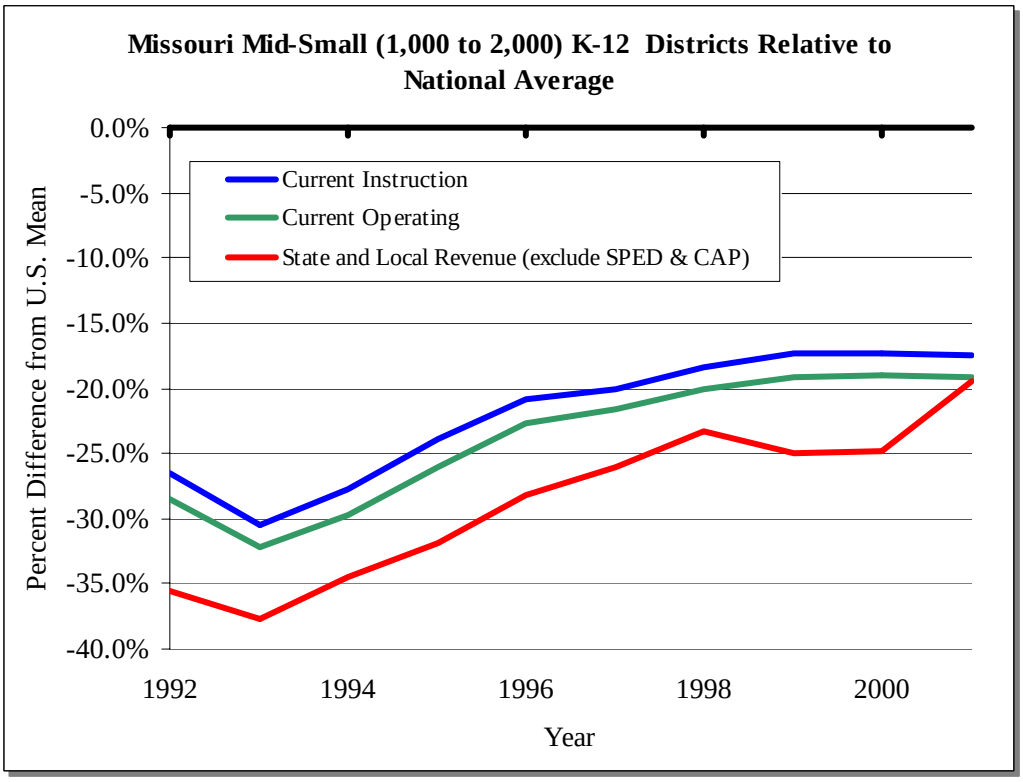
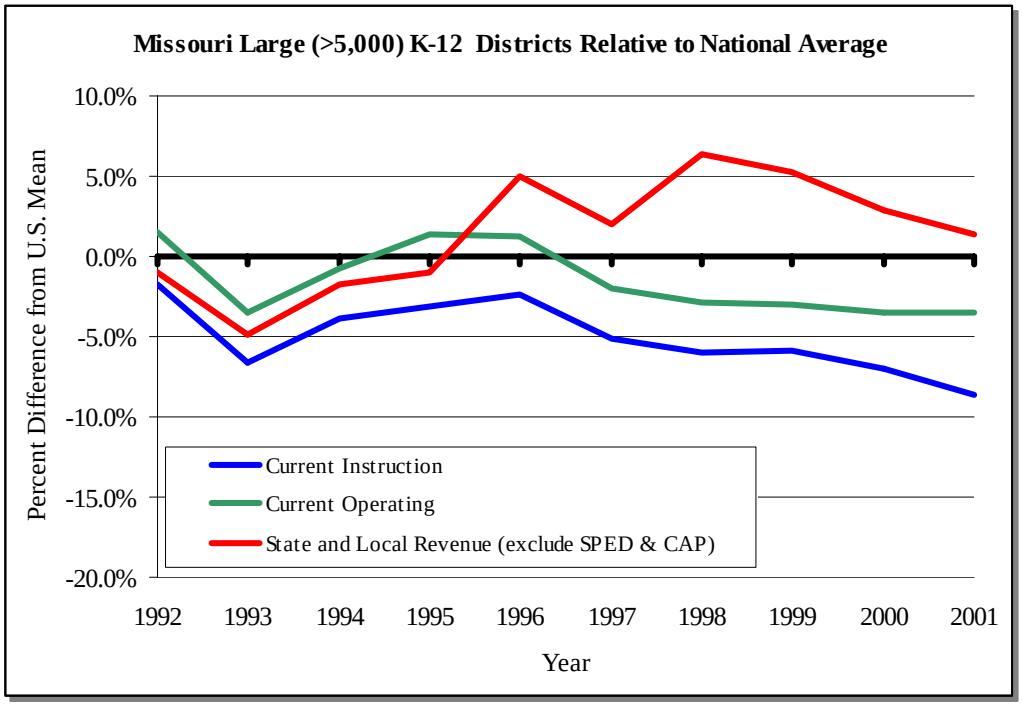


Figure **4** shows the trend for Missouri's larger districts. Missouri's larger districts have generally faired better than smaller ones, receiving and spending at or above national averages. However, starting around 1997, resources in larger districts have tailed off somewhat and risk sliding well behind national averages for districts of similar size. Note that while all districts with greater than 5,000 pupils are included in the figure, the trend is dominated by revenues and expenditures in Kansas City and St. Louis.

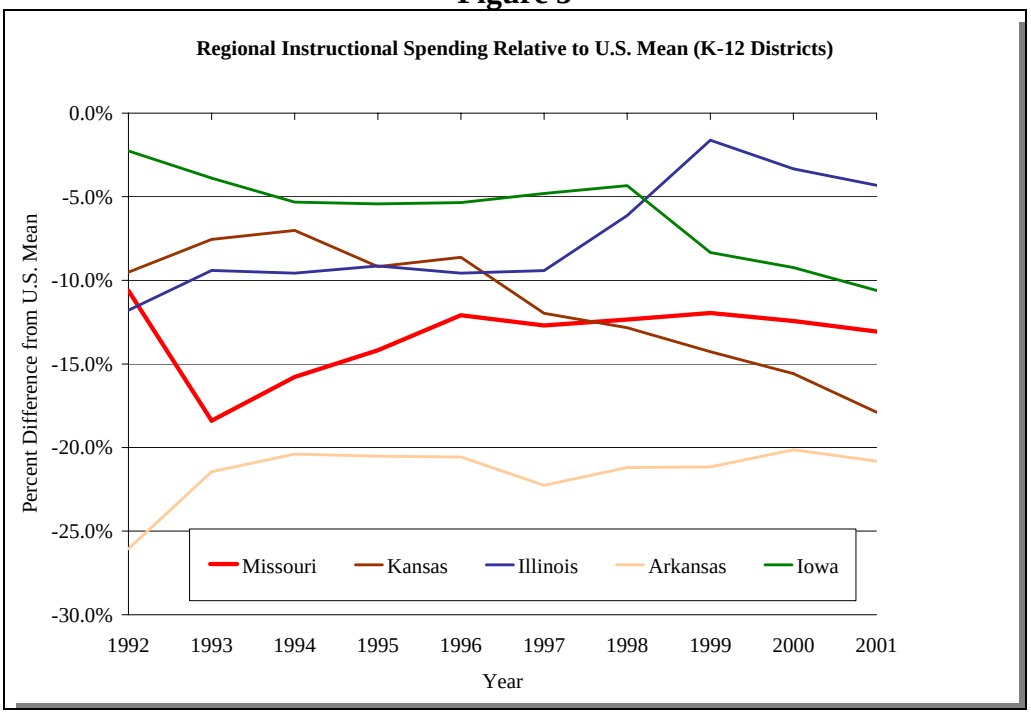
Figure 4



Data Source: U.S. Census Fiscal Survey

Figure 5 compares Missouri and its major bordering states to national average current instructional expenditures per pupil. Because of differences in accounting practices (e.g. what was or wasn't counted as "instructional" spending), it may not be appropriate to compare the **level** of spending in one state to another. Rather, what are of most importance in the figure are the trends. As noted previously, Missouri's position in recent years has held relatively constant with respect to national averages. Similarly, Arkansas has held relatively constant, though at a much lower level. Illinois' position has improved in recent years, jumping from nearly 10% behind national average to about 5% behind. Iowa has dropped from near average to about 10% below and Kansas, from 1994 to 2001 dropped from about 7% behind to 18% behind.

Figure 5



Data Source: U.S. Census Fiscal Survey

Table 3 indicates that by the end of the period under investigation, the relative position of Missouri's largest districts was much better than the state's smallest districts. Districts with the largest deficits relative to their peers in other states were districts with 800 to 2,200 pupils.

Table 3

Missouri vs. U.S. General Revenues per Pupil (Census) 2001

Enrollment	Missouri	US	% Difference
100 - 300	$6,010	$7,778	-22.7%
400 - 600	$5,116	$6,697	-23.6%
800 - 1200	$4,891	$6,621	-26.1%
1800 - 2200	$4,809	$6,471	-25.7%
3000 - 5000	$4,999	$6,297	-20.6%
8000 - 12000	$5,779	$6,143	-5.9%
>15000	$6,179	$5,352	15.5%

Source: U.S. Census Fiscal Survey 2001

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Summary:

- ✓ **Overall, Missouri districts have kept pace with the national average growth rate, but have remained behind (by about 10%, not regionally adjusted).**
- ✓ **Missouri small districts gained substantial ground through the 1990s, while Missouri larger districts which were in better shape to begin with, lost some ground in recent years.**
- ✓ **In terms of growth/decline, by remaining constant relative to national averages, Missouri did less well than Illinois, as well as Arkansas (but at a higher level), and much better than either Iowa or Kansas from 1993 to 2001.**
- ✓ **Missouri's larger districts remain on par with national average spending, but the state's smaller districts remain well behind despite significant gains from 1992 to 2001.**

1.2 Evaluating Horizontal Equity

Horizontal equity is often described as the "equal treatment of equals." In school finance policy, horizontal equity is measured in terms of the variations in resources available to students across school districts. It is critically important to understand that when we measure the variations in expenditures per pupil across Missouri school districts with conventional horizontal equity measures that we are measuring "equal treatment," and ASSUMING ALL DISTRICTS ARE EQUAL. That is, we assume that $5,000 per pupil in one district is of the same value (economically/ educationally) in any other district. This is obviously an incorrect assumption. Economically, due to variations in market prices for goods *of comparable quality* (teachers, materials, supplies, transportation contracts, construction costs), that $5,000 may purchase much more in some districts than others. Educationally, due to dramatic variations in student needs (disabilities, language proficiency, social and economic deprivation) the same $5,000 may be used to achieve much higher educational outcomes in some districts than others. That said, measures of variations in educational revenues or expenditures can shed some light on how or whether variance in resources is changing over time.

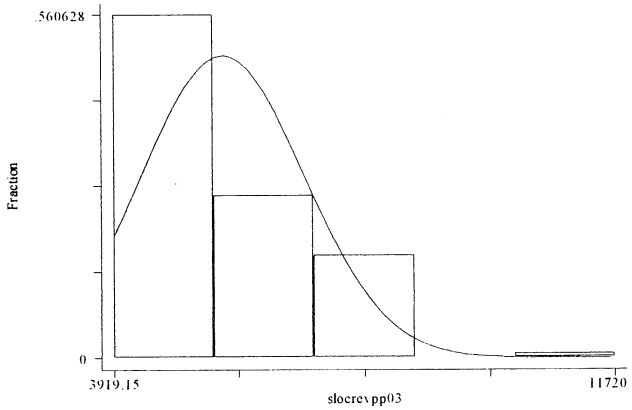
In this section we apply the following conventional equity statistics:

- Coefficient of Variation (CV): Perhaps the most commonly used measure of variance for educational resources. The coefficient of variation is the standard deviation divided by the mean, or expressed as a percent of the mean. By expressing the standard deviation as a percent, more useful comparisons may be made over time or across contexts. Over time, the standard deviation may increase, but the mean may similarly increase. The coefficient of variation will indicate whether the standard deviation as a percent of the mean has increased. Ideally, a coefficient of variation of 10% for per pupil expenditures, for example, would suggest that 2/3 of children attend districts within 10% of the average spending district (no consolation for those children attending districts with 50% to 100% higher than average costs). One shortcoming of standard deviations, coefficients of variation and even apparently simple calculations of the mean is that each of these measures assumes that the data in question are normally distributed. School district finance data rarely, if ever, meet this criterion (rarely come close for that matter).

Figure 6 displays the frequency distribution of general revenues per pupil for Missouri K-12 districts. Note that the largest group of districts fall in the group below (to the left of) the mean. Further, the left hand tail of the normal distribution extends beyond districts' actual revenues. That is, there really are no districts with revenues 2 standard deviations below the mean.

Figure 6

Frequency Distribution of General Revenues per Pupil (DESE)



Data Source: DESE School District Revenue 2003

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- Ranges & Range Ratios: Range Ratios, like coefficients of variation are useful for standardizing the scale of equity indicators. For example, the table below presents a comparison of two states, where State A has a high spending district with $8,000 per pupil and a low spending district with $6,000 per pupil and State B has a high spending district with $4,000 per pupil and a low spending district with $3,000 per pupil. Using range only to compare equity across the two states we conclude that State A is less equitable than state B. However, if we calculate the disparity (range) as a percent of the minimum, we find that the disparity is 33% for both states. Just as ratios allow comparisons across states with varied levels of resources, ratios can also be used to compare conditions in a given state over time, where inflation has changed the overall level of resources. Often, ranges of expenditures will grow over time, while range ratios will decline due to increases in average or base levels of spending. A commonly used statistic in school finance equity analysis is the *Federal Range Ratio.* The Federal Range Ratio removes outlier districts from each end of the distribution and focuses on the range between the 95%ile and 5%ile of available resources. The difference between the 95%ile and 5%ile is expressed as a percent of the 5%ile.

Table 4

	State A	State B
High	$ 8,000	$ 4,000
Low	$ 6,000	$ 3,000
Range	$ 2,000	$ 1,000
Range Ratio	33%	33%
Mean	$ 7,000	$ 3,500
Standard Deviation	$ 500	$ 250
Coefficient of Variation	7.1%	7.1%

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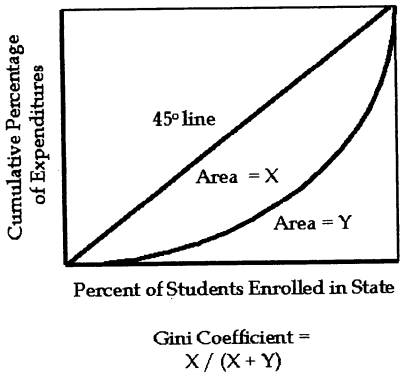
- McLoone Index: The McLoone index is unique to school finance and different from other school finance equity indices in that it focuses on the distribution of resources only in the lower half of districts. As such, some consider the McLoone index to be an index of adequacy rather than equity. The McLoone index is calculated by estimating first the position of the median pupil with respect to the object in question, usually fiscal resources. Next, the mean level of the object is calculated for all pupils below the median. Finally, the mean of the lower 50% of pupils is divided by the median for all pupils. As such, the McLoone index represents, how close, or far, on average are the lower half of pupils to the median pupil in their available resources.

- Gini Coefficient: The Gini Coefficient is a measure most often used for the study of income inequality. The Gini coefficient presumes a condition of perfect equity where each 1% of the individuals receive 1% of the objects. That is, graphically, with individuals along the X axis and objects along the Y, the first 1% of individuals have 1% of the objects available to them, the first 2% of individuals have 2% of the objects available to them and so on, creating a 45 degree line. If objects are unevenly distributed, however, the line will not be straight. If we sort the individuals by the number of objects they have, from low to high, we might find that the first 1% of individuals have only .5% of the total objects and that the first 2% of individuals have only the first 1% of objects. This line sags below the desired 45 degree line. Ultimately, 100% of the object must be consumed by 100% of the individuals, so the actual distribution must curve back to meet with the 45 degree line. The extent of "sag," (area between the curve and the 45 degree line) as seen in the figure below indicates the extent of inequity. The coefficient itself is the ratio of the area between the curve and the line to the total area under the 45 degree line. As such, a Gini coefficient where the area between the curve and the line approaches "0," thus the coefficient approaches "0," indicates perfect equity. An alternate approach is to sort the individuals not by

how much of the object they have, but by some other measure of their wealth, creating a hybrid measure of fiscal neutrality as well as equity.

Figure 7



Gini Coefficient =
X / (X + Y)

U.S. Census Bureau Data 1992 - 2001[6]

Table 5 provides a comprehensive summary of means, standard deviations and coefficients of variation for all resources measures derived from the Census Fiscal survey data. Figure 8 focuses on the coefficients of variation from 1992 to 2001 for K-12 districts for our three main resource measures. Overall, from 1993 to 2001 there was steady reduction in variance in resources across Missouri districts. Variance declined from over 30% to about 20% for current expenditures and general revenues and declined from just over 20% to just over 10% for instructional expenditures per pupil.

Figure 8

Coefficients of Variation from 1992 to 2001

[6] Finance: http://www.census.gov/govs/www/school.html, Demographics: http://nces.ed.gov/surveys/sdds/c2000.asp

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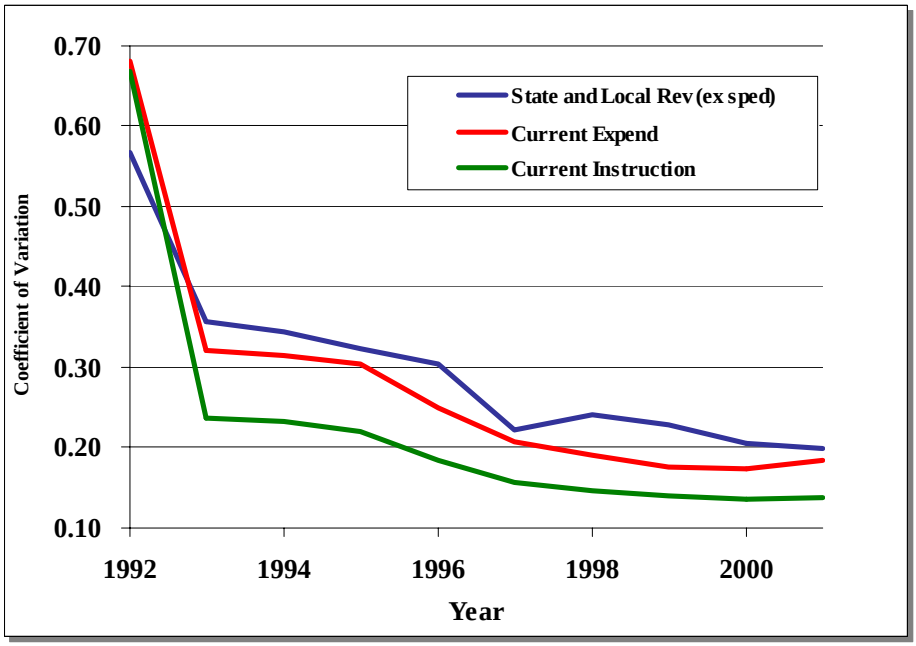
0.70
0.60
0.50
0.40
0.30
0.20
0.10
Coefficient of Variation
1992
1994
1996
1998
2000
Year
State and Local Rev (ex sped)
Current Expend
Current Instruction

Table 5
Summary Statistics

	State and Local Revenue per Pupil				State and Local Revenue per Pupil (Exclude SPED)				State and Local Revenue per Pupil (Exclude SPED & CAPOUT)				Current Instructional Spending per Pupil				Current Expenditures per Pupil				Cost Adjusted Revenues per Pupil (Exclude SPED & CAPOUT)		
YEAR	k-8	k-12	Special	Total	k-8	k-12	Special	Total	k-8	k-12	Special	Total	k-8	k-12	Special	Total	k-8	k-12	Special	Total	k-8	k-12	Total
1992																							
Mean	$4,674	$4,599	.	$4,600	$4,515	$4,415	.	$4,416	$4,358	$3,833	.	$3,841	$2,151	$2,635	.	$2,628	$3,596	$4,313	.	$4,302	$3,535	$3,498	$3,499
Stdev	$1,012	$2,944	.	$2,925	$984	$2,509	.	$2,494	$978	$2,132	.	$2,121	$435	$1,762	.	$1,751	$791	$2,931	.	$2,912	$676	$852	$850
CV	21.7%	64.0%		63.6%	21.8%	56.8%		56.5%	22.4%	55.6%		55.2%	20.2%	66.9%		66.6%	22.0%	68.0%		67.7%	19.1%	24.4%	
1993																							
Mean	$4,856	$4,539	.	$4,543	$4,686	$4,375	.	$4,379	$4,477	$3,895	.	$3,904	$2,181	$2,562	.	$2,556	$3,643	$4,196	.	$4,188	$3,637	$3,660	$3,659
Stdev	$996	$1,567	.	$1,561	$964	$1,561	.	$1,554	$1,007	$1,381	.	$1,378	$431	$605	.	$604	$747	$1,346	.	$1,340	$774	$922	$920
CV	20.5%	34.5%		34.4%	20.6%	35.7%		35.5%	22.5%	35.4%		35.3%	19.8%	23.6%		23.6%	20.5%	32.1%		32.0%	21.3%	25.2%	
1994																							
Mean	$5,249	$4,786	$23,281	$4,926	$5,067	$4,620	$17,661	$4,720	$4,701	$4,099	$16,988	$4,200	$2,354	$2,713	$16,699	$2,809	$3,942	$4,454	$26,009	$4,602	$3,815	$3,848	$3,848
Stdev	$1,033	$1,602	$0	$2,230	$994	$1,592	$0	$1,927	$1,065	$1,406	$0	$1,773	$519	$629	$0	$1,339	$930	$1,401	$0	$2,294	$778	$870	$868
CV	19.7%	33.5%		45.3%	19.6%	34.5%		40.8%	22.6%	34.3%		42.2%	22.0%	23.2%		47.7%	23.6%	31.5%		49.9%	20.4%	22.6%	
1995																							
Mean	$5,745	$5,124	$23,574	$5,270	$5,572	$4,955	$18,068	$5,061	$5,086	$4,342	$17,569	$4,451	$2,491	$2,884	$16,942	$2,984	$4,164	$4,734	$25,976	$4,884	$4,157	$4,114	$4,115
Stdev	$1,245	$1,609	$4,618	$2,272	$1,223	$1,598	$3,925	$1,963	$1,122	$1,215	$3,789	$1,679	$498	$632	$2,693	$1,374	$876	$1,442	$4,917	$2,342	$761	$751	$751
CV	21.7%	31.4%		43.1%	22.0%	32.3%		38.8%	22.1%	28.0%		37.7%	20.0%	21.9%		46.1%	21.0%	30.5%		48.0%	18.3%	18.3%	
1996																							
Mean	$6,351	$5,503	$22,923	$5,648	$6,178	$5,328	$17,830	$5,435	$5,386	$4,676	$17,609	$4,784	$2,719	$3,050	$15,678	$3,142	$4,569	$4,965	$24,532	$5,110	$4,396	$4,442	$4,441
Stdev	$1,072	$1,631	$4,131	$2,236	$1,041	$1,621	$3,456	$1,956	$1,281	$1,309	$3,455	$1,738	$510	$564	$2,165	$1,244	$859	$1,242	$4,232	$2,122	$824	$883	$882
CV	16.9%	29.6%		39.6%	16.8%	30.4%		36.0%	23.8%	28.0%		36.3%	18.7%	18.5%		39.6%	18.8%	25.0%		41.5%	18.7%	19.9%	
1997																							
Mean	$6,479	$5,664	$20,619	$5,798	$6,302	$5,489	$16,031	$5,587	$5,683	$4,872	$15,911	$4,974	$2,892	$3,139	$14,300	$3,227	$4,846	$5,091	$22,216	$5,228	$4,683	$4,644	$4,645
Stdev	$1,098	$1,222	.	$1,819	$1,084	$1,223	$0	$1,547	$1,132	$1,127	$0	$1,503	$525	$494	$0	$1,123	$858	$1,058	$0	$1,871	$699	$810	$808
CV	16.9%	21.6%		31.4%	17.2%	22.3%		27.7%	19.9%	23.1%		30.2%	18.2%	15.7%		34.8%	17.7%	20.8%		35.8%	14.9%	17.4%	
1998																							
Mean	$6,764	$6,029	$21,139	$6,168	$6,591	$5,847	$16,414	$5,948	$5,988	$5,236	$16,262	$5,341	$3,156	$3,294	$14,692	$3,390	$5,230	$5,349	$22,636	$5,495	$4,972	$4,972	$4,972
Stdev	$1,408	$1,409	$3,626	$1,991	$1,397	$1,414	$3,046	$1,724	$1,628	$1,416	$3,065	$1,753	$585	$480	$1,987	$1,162	$974	$1,015	$3,688	$1,901	$1,170	$961	$964
CV	20.8%	23.4%		32.3%	21.2%	24.2%		29.0%	27.2%	27.0%		32.8%	18.5%	14.6%		34.3%	18.6%	19.0%		34.6%	23.5%	19.3%	
1999																							
Mean	$7,105	$6,261	$22,928	$6,416	$6,915	$6,070	$17,941	$6,183	$6,348	$5,389	$17,700	$5,508	$3,304	$3,477	$15,798	$3,581	$5,495	$5,640	$23,853	$5,795	$5,176	$5,114	$5,115
Stdev	$1,260	$1,381	$0	$2,068	$1,239	$1,387	$0	$1,766	$1,107	$1,426	$0	$1,820	$632	$488	$0	$1,242	$1,021	$989	$0	$1,954	$734	$929	$926
CV	17.7%	22.1%		32.2%	17.9%	22.9%		28.6%	17.4%	26.5%		33.0%	19.1%	14.0%		34.7%	18.6%	17.5%		33.7%	14.2%	18.2%	
2000																							
Mean	$7,905	$6,667	$26,303	$6,843	$7,695	$6,466	$21,020	$6,601	$6,961	$5,635	$20,403	$5,773	$3,567	$3,672	$17,560	$3,784	$5,974	$5,972	$26,858	$6,143	$5,699	$5,375	$5,379
Stdev	$1,339	$1,321	$0	$2,207	$1,334	$1,334	$0	$1,870	$1,449	$1,372	$0	$1,911	$600	$500	$0	$1,346	$1,105	$1,031	$0	$2,143	$1,134	$1,064	$1,065
CV	16.9%	19.8%		32.2%	17.3%	20.6%		28.3%	20.8%	24.3%		33.1%	16.8%	13.6%		35.6%	18.5%	17.3%		34.9%	19.9%	19.8%	
2001																							
Mean	$8,315	$7,103	$25,903	$7,272	$8,104	$6,877	$20,560	$7,004	$7,688	$6,083	$20,313	$6,220	$3,763	$3,891	$18,823	$4,011	$6,315	$6,415	$28,881	$6,597	$6,288	$5,832	$5,838
Stdev	$1,473	$1,359	$0	$2,171	$1,469	$1,366	$0	$1,840	$1,387	$1,287	$0	$1,820	$699	$533	$0	$1,446	$1,269	$1,189	$0	$2,344	$842	$1,047	$1,046
CV	17.7%	19.1%		29.9%	18.1%	19.9%		26.3%	18.0%	21.2%		29.3%	18.6%	13.7%		36.1%	20.1%	18.5%		35.5%	13.4%	18.0%	

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Analysis of DESE Revenue and Expenditure Data 1994 - 2003[7]

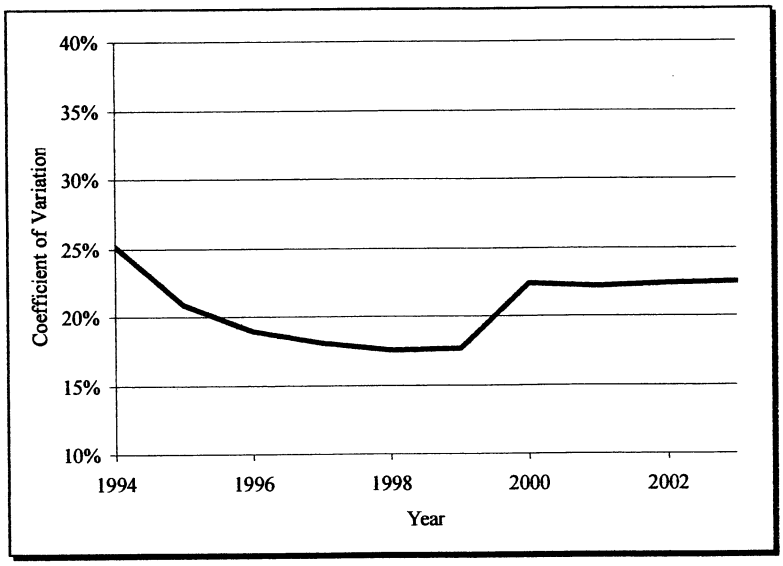
Table 6 and Figure 9 summarize trends in state and local general revenues per pupil from 1994 to 2003, using data from DESE. Consistent with the federal data, there appears to have been consistent improvement in equity from 1994 through about 1999, with revenue variance declining below 20%. However, Table 6 and Figure 9 suggest some backsliding in equity from 1999 to 2000. This backsliding occurs on all equity measures, but those measures remain relatively constant from 1999 through 2003.

Table 6
Foundation Formula State and Local General Revenues per Pupil 1994 to 2003

Year	Mean	Std. Dev.	Min	Max	95%ile	5%ile	CV	Range Ratio	Federal Range Ratio	McLoone Index	Gini Coefficient
1994	$3,303	$ 833	$2,149	$ 7,627	$ 4,832	$2,316	25.2%	2.55	1.09	0.86	0.13
1995	$3,484	$ 727	$2,618	$ 6,972	$ 5,050	$2,756	20.9%	1.66	0.83	0.92	0.11
1996	$3,800	$ 720	$2,981	$ 7,013	$ 5,494	$3,096	19.0%	1.35	0.77	0.91	0.10
1997	$4,142	$ 748	$3,041	$ 8,094	$ 5,941	$3,380	18.1%	1.66	0.76	0.90	0.10
1998	$4,234	$ 743	$3,290	$ 7,751	$ 6,014	$3,445	17.6%	1.36	0.75	0.90	0.09
1999	$4,457	$ 785	$3,418	$ 7,668	$ 6,189	$3,566	17.6%	1.24	0.74	0.90	0.10
2000	$4,780	$ 1,068	$3,513	$ 7,761	$ 6,989	$3,649	22.3%	1.21	0.92	0.91	0.12
2001	$5,132	$ 1,135	$3,716	$ 8,611	$ 7,451	$3,928	22.1%	1.32	0.90	0.90	0.12
2002	$5,387	$ 1,202	$3,844	$ 9,661	$ 7,724	$4,079	22.3%	1.51	0.89	0.89	0.12
2003	$5,620	$ 1,262	$3,919	$11,720	$ 8,082	$4,194	22.4%	1.99	0.93	0.89	0.12

Source: DESE District Level Finance Data
All analysis weighted for district enrollment

Figure 9
Coefficient of Variation for Foundation Revenues per Pupil 1994 to 2003



[7] Primary Data Source: http://www.dese.state.mo.us/schooldata/ftp/finance.xls

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Table 7 evaluates DESE expenditure data from 1999 through 2003. Like Table 6 and Figure 9, Table 7 shows that for K-12 districts, variance has remained relatively constant in recent years. For K-8 districts, variance in current expenditures per enrolled pupil has increased, but variance in current expenditures per pupil in average daily attendance has remained constant. This suggests that the formula, which funds on the basis of average daily attendance is having a constant effect on these districts, but that eligible pupil count methods (which allow for use of prior year data in cases of declining enrollment) may be leading to increased variance in funding per enrolled pupil among these mostly smaller, rural districts.

Table 7
Equity Statistics for Expenditure Data 1999 to 2003

Current Expenditures per Enrolled Pupil

K-8

Year	*Mean*	*Std. Dev.*	*Min*	*Max*	*CV*
1999	$ 6,747	$ 1,145	$5,477	$13,920	17.0%
2000	$ 7,394	$ 1,284	$3,808	$13,112	17.4%
2001	$ 7,928	$ 1,419	$4,256	$13,857	17.9%
2002	$ 8,475	$ 1,606	$4,587	$15,519	19.0%
2003	$ 8,822	$ 1,814	$4,817	$21,142	20.6%

K-12

Year	*Mean*	*Std. Dev.*	*Min*	*Max*	*5%ile*	*95%ile*	*CV*	*Federal Range Ratio*	*McLoone Index*	*Gini Coefficient*
1999	$ 5,320	$ 1,080	$3,365	$10,505	$4,102	$ 8,005	20.3%	0.95	0.91	0.11
2000	$ 5,673	$ 1,143	$3,514	$10,978	$4,324	$ 8,420	20.1%	0.95	0.89	0.11
2001	$ 6,089	$ 1,283	$3,588	$12,345	$4,632	$ 9,141	21.1%	0.97	0.91	0.11
2002	$ 6,490	$ 1,434	$4,116	$13,137	$4,936	$10,172	22.1%	1.06	0.91	0.11
2003	$ 6,688	$ 1,353	$4,326	$15,668	$5,177	$10,055	20.2%	0.94	0.90	0.11

Current Expenditures per ADA

K-8

Year	*Mean*	*Std. Dev.*	*Min*	*Max*	*CV*
1999	$ 5,106	$ 865	$3,730	$10,095	16.9%
2000	$ 5,522	$ 958	$4,390	$12,261	17.3%
2001	$ 5,917	$ 1,005	$4,610	$10,883	17.0%
2002	$ 6,260	$ 1,028	$4,764	$10,277	16.4%
2003	$ 6,515	$ 1,104	$5,016	$12,588	16.9%

K-12

Year	*Mean*	*Std. Dev.*	*Min*	*Max*	*5%ile*	*95%ile*	*CV*	*Federal Range Ratio*	*McLoone Index*	*Gini Coefficient*
1999	$ 5,724	$ 1,105	$3,753	$11,239	$4,409	$ 8,270	19.3%	0.88	0.90	0.10
2000	$ 6,114	$ 1,240	$4,143	$11,627	$4,661	$ 8,951	20.3%	0.92	0.89	0.11
2001	$ 6,548	$ 1,377	$4,576	$12,980	$4,987	$ 9,752	21.0%	0.96	0.91	0.11
2002	$ 6,909	$ 1,570	$4,775	$13,885	$5,164	$10,975	22.7%	1.13	0.90	0.12
2003	$ 7,090	$ 1,473	$4,887	$13,583	$5,412	$10,943	20.8%	1.02	0.90	0.11

Source: DESE District Level Finance Data
All analysis weighted for district enrollment

Summary:

- ✓ **From the early 1990s through about 1999 or 2000, Missouri experienced consistent reductions in variance in revenues and expenditures per pupil, whether measured with U.S. Census Bureau or DESE data.**

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- ✓ **From 1999 to 2000, there may have been some backsliding in equity.**
- ✓ **From 2000 to 2003, equity has remained relatively constant in Missouri, with revenue variance at about 20% (CV) for K-12 districts.**

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Evaluating Resource Neutrality

The first section identified that variations in resources declined steadily through the 1990s and have remained relatively constant from 1999 through 2003 in Missouri. Yet, by the standards espoused by some in school finance, substantial variance continues to exist.

This section addresses the correlates of those variations in resources. That is, are resource variations identified associated with local fiscal capacity, cost factors, both or neither? Under a school funding model which retains substantial local control over revenues, like that used in Missouri, one might become concerned that districts with more resources are simply those that have greater local capacity to raise resources. That is, resources are positively associated with local fiscal capacity, or the system is not *fiscally neutral.* Often, fiscal neutrality in education finance is described as the condition where the quality of education a child receives is not dependent on the wealth of the neighborhood in which he/she resides.

Fiscal neutrality, as typically measured,[8] may or may not be a central policy concern in Missouri. Much depends on the nature of the wealth-revenue relationship. For example, are all districts provided sufficient, basic resources by the state and is the loss to neutrality a function of a handful of very high wealth districts spending disproportionate amounts? Also, do many of the high capacity districts also face higher costs?

We take 4 approaches to evaluating underlying relationships of schooling resources. We begin by exploring *neutrality* broadly, testing whether revenue and expenditure data are associated not only with property wealth per pupil, but also with median household income, median housing unit values and demographic data on poverty and minority concentrations. Next, we construct a multivariate model to test whether the overall relationship between fiscal capacity measures and resources has changed over time. Finally, we add to our fiscal capacity neutrality model a series of potential cost factors, to discern whether, in fact, some of the variations in resources that appear to be related to capacity may in fact be related with cost factors. Finally, we take a pictorial stroll through the various underlying relationships and trends in those relationships over time.

Table 8 presents correlations between DESE revenue and expenditure measures, and (a) assessed value per pupil (DESE), (b) median housing unit values (Census 2000), (c) median household income (Census 2000), (d) percent minority (Census 2000) and (c) percent of children between 5 and 17 in poverty (Census 2000). Using expenditure measures, the correlation with assessed value declined from 1999 to 2002, and increased slightly in 2003. Using the revenue measure, the correlation with assessed value jumped to a high in 2003. Note that this could occur as a function of reductions to the line 1b proration factor, leaving districts with their local revenues from tax rates above $2.75, but cutting back on state revenues that serve specifically to reduce the wealth-spending relationship.

Notably, the relationship between median housing unit values and expenditures and revenues is much weaker than the relationship between assessed valuation and expenditures and revenues. This finding suggests that disparities in revenues and expenditures are significantly influenced by the taxable value of non-residential properties (commercial, industrial, farming). The relationship between income and expenditure measures is weak for all years, but the relationship between income and revenues creeps upward from 2001 to 2003. At the same time, the relationship between housing unit values and revenues increases. These findings suggest that in recent years, higher capacity neighborhoods (Park Hill, Lee's Summit, Ladue, Clayton) have outpaced their lower capacity peers in revenues per pupil.

[8] Correlations between revenues per pupil and property wealth per pupil

Table 8 indicates a moderate positive poverty effect across all years, with some erosion of that effect from 2001 to 2003. That is, overall, districts with more children in poverty have more resources per pupil, but the strength of that relationship has weakened in recent years. Similarly, in Missouri, districts with more minority pupils have systematically more resources per pupil. And similarly, this relationship has weakened from 2001 to 2003. This relationship is included in the analysis because recent litigation in Missouri's neighbor to the west – Kansas – revealed that among other things, the Kansas school finance formula systematically deprives children in districts with the most minority children.[9] Missouri presents a striking contrast with Kansas in this regard, with the strongest underlying correlation for education resources being a strong, positive correlation with percent minority.[10]

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Table 8
Initial tests of *Neutrality*

Current Expenditures per Enrolled Pupil

	1999	2000	2001	2002	2003
Assessed Value	0.52	0.51	0.47	0.40	0.44
Median Household Income	0.08	0.05	0.01	-0.04	0.03
Median Housing Unit Value	0.18	0.15	0.12	0.07	0.14
Percent Minority	0.65	0.68	0.67	0.70	0.65
Percent Poverty	0.27	0.28	0.32	0.36	0.29

Current Expenditures per ADA

	1999	2000	2001	2002	2003
Assessed Value	0.58	0.53	0.49	0.42	0.44
Median Household Income	0.16	0.09	0.04	-0.02	0.04
Median Housing Unit Value	0.25	0.18	0.14	0.09	0.15
Percent Minority	0.61	0.68	0.68	0.71	0.67
Percent Poverty	0.18	0.26	0.30	0.35	0.29

Foundation Formula Revenues per Pupil

	1999	2000	2001	2002	2003
Assessed Value per Pupil	0.51	0.36	0.36	0.44	0.55
Median Household Income	0.23	0.02	0.03	0.10	0.21
Median Housing Unit Value	0.25	0.05	0.07	0.15	0.30
Percent Minority	0.64	0.79	0.78	0.72	0.64
Percent Poverty	0.08	0.32	0.30	0.23	0.13

Source: Expenditures from DESE District Level Finance Data. Economic and demographic data from U.S. Census 2000
All analysis weighted for district enrollment
K-12 districts only

Table 9 presents the findings of multivariate tests of fiscal neutrality over time. We assume that local voters' decisions to spend on education are a combined function of (a) their income and (b) the price in taxes of an additional dollar of school revenue – tax price. In a system under complete local control, without state intervention in the form of equalization aid, we would expect these two factors to be dominant predictors of revenue per pupil. However, we would expect state equalization aid to counterbalance these effects, especially where state aid is adjusted for both property wealth (equalizing tax price) and income.

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The tax price measure is derived by dividing the value of the median housing unit (19% of market

[9] Similar allegations of racially disparate effect were made in *Campaign for Fiscal Equity* (New York).

[10] In fact, one might argue that the formula disparately affects white children in smaller rural communities. This argument only applies however, if it can be shown that the costs of educating white children in smaller rural communities are comparable.

value) from Census 2000, by the assessed valuation per pupil of each district (DESE). For example, if the median voter owns a house with a taxable value of $100k in a district with $100k in average assessed value per pupil, a 1% tax rate will cost the median voter $1,000 per year and will raise for the school district $1,000 per year. The tax share in this case would be 1. If the median voter owns a house of the same value in a district with average property values of $500k per pupil, a 1% tax rate will now provide $5,000 in school spending. The tax share in this case would be significantly lower, $1,000/$5,000 = 0.2. That is, the price of each additional dollar of school district revenue is lower for the voter in the district with greater property wealth per pupil (20 cents per dollar of revenue instead of $1 per dollar of revenue).

Of primary interest are (a) the trend over time in r-square values and (b) the trends over time in the size of the coefficients on income and tax price. Because current expenditures of districts may also include expenditure of federal funds, we include a measure of the percent of each district's budget from federal sources. For expenditure measures, there appears to be a consistent decrease in the influence of fiscal capacity over time, as evidenced by the declining r-squared values. For revenue data, there appears to be a jump in 2003, matching that seen in the correlations in the previous table. Coefficients on the capacity variables provide additional evidence of these patterns. From 1999 to 2003, the elasticity between income and expenditures declines from .26 to .20. That is, in 1999 a 1% difference in median household income was associated with .26% difference expenditures per pupil, but in 2003, a 1% difference in median household income was associated with only a .20% difference in expenditures per pupil. Again, there is a jump upward in these measures for the revenue variable.

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Table 9

Multivariate Fiscal Neutrality Test

Current Expenditure per Enrolled Pupil

	1999	2000	2001	2002	2003
Income	0.26 ***	0.23 ***	0.20 ***	0.21 ***	0.20 ***
Tax Price	-0.29 ***	-0.29 ***	-0.30 ***	-0.30 ***	-0.27 ***
Federal Subsidy	0.08 ***	0.07 **	0.07 **	0.09 ***	0.07 **
R-Squared	0.32	0.32	0.30	0.29	0.27
Adj. R-squared	0.31	0.31	0.30	0.29	0.26

Current Expenditure per ADA

	1999	2000	2001	2002	2003
Income	0.29 ***	0.25 ***	0.22 ***	0.24 ***	0.22 ***
Tax Price	-0.29 ***	-0.30 ***	-0.31 ***	-0.32 ***	-0.28 ***
Federal Subsidy	0.07 ***	0.07 **	0.07 **	0.09 ***	0.07 **
R-Squared	0.35	0.34	0.33	0.31	0.28
Adj. R-squared	0.35	0.34	0.33	0.30	0.28

Foundation Formula Revenue per EP

	1999	2000	2001	2002	2003
Income	0.16 ***	0.16 ***	0.17 ***	0.17 ***	0.21 ***
Tax Price	-0.22 ***	-0.29 ***	-0.28 ***	-0.30 ***	-0.31 ***
Federal Subsidy	-0.01	0.03	0.03	0.01	-0.01
R-Squared	0.30	0.26	0.26	0.29	0.35
Adj. R-squared	0.30	0.26	0.25	0.28	0.35

Source: Expenditures from DESE District Level Finance Data. Economic and demographic data from U.S. Census 2000

*p<.10, **p<.05, ***p<.01

All analysis weighted for district enrollment

K-12 districts only

Table 10 uses census demographic data and DESE revenue data to test whether differences in resources are logically associated with a variety of potential student and district cost factors in addition to local fiscal capacity measures. In this case, income and tax price are combined into one aggregate index – where higher capacity districts (high income, low tax price) receive a higher index. This step is taken to reduce the relationship between the capacity measures, and potential cost factors like "percent poverty." Urbanicity and minority status are included mainly to separate the effects of urban poverty from rural poverty. Using standard poverty indices from the U.S. Census bureau and expressing poverty in percentage terms, small rural districts with only a handful of children living slightly below the poverty may appear as impoverished as larger urban districts with much higher concentrations of more severe poverty.

Urban poverty is often coupled with minority concentrations. Using minority concentration measures has the additional benefit of identifying higher costs in smaller communities dominated by migrant workers as well as identifying impoverished urban communities. Missing in Table 10, but addressed at a later point, are current performance deficits of children. One might argue that the costs of achieving proficiency under No Child Left Behind will necessarily be higher in those districts with the children who are currently least proficient. At this point, we focus only on demographic measures expected to be highly related with current proficiency status.

Table 10 also includes district cost factors such as economies of scale (enrollment and enrollment squared) and geographic variations in the prices of doing business (National Center for Education Statistics, Geographic Cost of Education Index). Note that the geographic price index used here, and later in this report tends to overstate generally, the wages of teachers in metropolitan areas compared with the prices of recruiting teachers of similar background to remote rural areas. In addition, the NCES GCEI overstates teacher wages in wealthy suburbs compared with the price of recruiting the same teacher into a poor urban district. For example, St. Louis receives a 1.04 price index, whereas Ladue receives a 1.11, suggesting that it would cost Ladue 7% more than St. Louis to recruit a teacher of the *same* qualifications. More appropriate wage indices need to be developed for the state of Missouri both for analytical and policy design purposes.

Table 10

Multivariate Test Including Possible Cost Factors

	General Revenues 99	General Revenues 00	General Revenues 01	General Revenues 02	General Revenues 03
Student Cost Factors					
Percent Poverty	-0.143 *	-0.007	-0.059	-0.007	-0.014
Percent LEP	-0.315	0.649 *	0.855 **	1.037 ***	1.068 ***
Percent Disabled	-0.332 *	-0.189	-0.341 *	-0.329	-0.300
Percent Urban	0.109 ***	0.067 ***	0.079 ***	0.111 ***	0.133 ***
Percent Minority	0.402 ***	0.562 ***	0.566 ***	0.475 ***	0.380 ***
District Cost Factors					
Regional Wage Index	0.571 ***	0.490 ***	0.489 ***	0.689 ***	0.774 ***
Enrollment (ln)	-0.476 ***	-0.556 ***	-0.535 ***	-0.551 ***	-0.513 ***
Enrollment Squared (ln)	0.026 ***	0.032 ***	0.031 ***	0.031 ***	0.028 ***
Capacity Index (income & tax price)	0.107 ***	0.104 ***	0.103 ***	0.125 ***	0.157 ***
CONSTANT	9.893 ***	10.217 ***	10.250 ***	10.235 ***	10.064 ***
R-squared	0.717	0.795	0.779	0.763	0.751
Adj R-squared	0.711	0.791	0.775	0.758	0.746

Sources: Revenue data from DESE. Demographic data from U.S. Census 2000

*p<.10, **p<.05, ***p<.01

All analysis weighted for district enrollment. K-12 districts only

In general, the relationship between fiscal capacity and general revenues per pupil, controlling for cost factors, has increased from 1999 to 2003. So too has the relationship between the regional wage index (GCEI) and revenues per pupil. Given the nature of the NCES wage index, this may imply that the wealthiest suburban areas have experienced the greatest increases in revenue (a finding consistent with most other analyses in this report), or have *run away from the pack.*

Table 10 also indicates strong, consistent, positive effects of urbanicity factors – percent urban and percent minority. In recent years, the positive minority effect has declined. The lack of statistical significance on the poverty factor may indicate that the formula does less well at accommodating poverty in rural areas than it does in urban areas. That is, the formula does less well at providing more money to high poverty rural districts than to low poverty rural districts. Interestingly, despite the lack of an adjustment for language proficiency status or bilingual education programs, in recent years a positive relationship has emerged between general revenues and percent limited English proficient.

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Summary:

- ✓ **In recent years, whether measured via simple correlations between revenues, income and property wealth, or more complex models combining fiscal capacity measures and cost factors, the relationship between revenues and fiscal capacity has strengthened. The Missouri school funding system has become less fiscally neutral.**
- ✓ **Overall, it appears that the Missouri school funding system favors higher fiscal capacity communities and urban centers with high minority concentrations.**
- ✓ **Districts with higher predicted competitive wages (as measured by the NCES cost index) appear to have more revenue per pupil (mainly wealthy suburban districts).**
- ✓ **Controlling for other factors, there does appear to be an economies-of-scale effect (declining revenues with increasing district size, but increasing again for very large districts).**

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Graphic Analysis of Resource Relationships

In this section we use graphic analysis to explore the relationships between district revenues and other measures. We use "bubble" graphs for our visual analysis of relationships.

Figure 10 is one such graph. In the figure, district enrollment is along the X axis and revenue per pupil along the Y axis. The size of the circles represents the relative size of districts, with Kansas City and St. Louis being the largest two "bubbles" on the graph. Because enrollment is also along the horizontal axis, Kansas City and St. Louis are also found at the far right of the graph. By their elevation (position relative to the vertical axis), one can see that Kansas City and St. Louis each have relatively high revenue per pupil, higher than most other districts in the state, though much lower than the two much smaller districts in the upper left hand corner of the graph.

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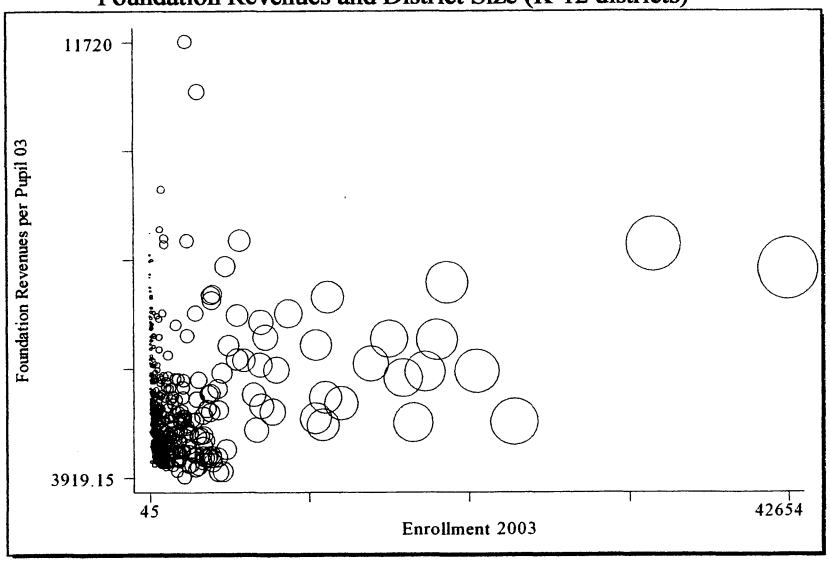
Figure 10

Foundation Revenues and District Size (K-12 districts)



Overall, the figure shows that among larger districts, the largest tend to have the most in revenue per pupil. This pattern is driven primarily by the position of Kansas City and St. Louis. There is substantial variance in revenue among other large districts in the state.

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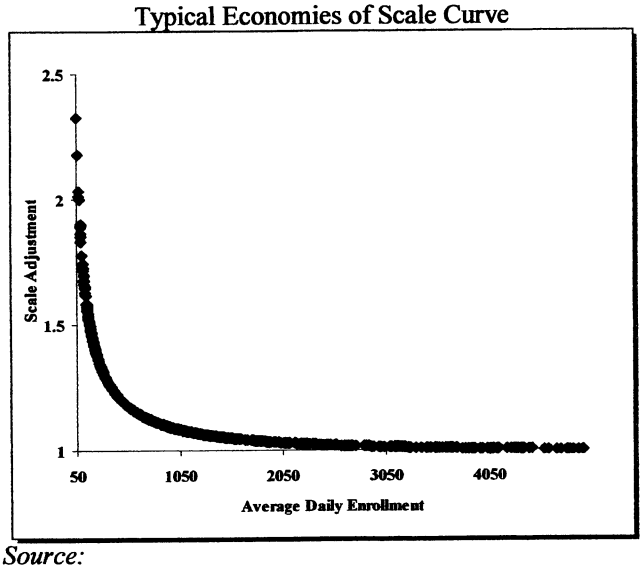
Figure 10 also reveals a "string" of smaller districts with higher revenues per pupil along the left hand edge of the graph. These higher revenues in very small districts are a common reflection of economies of scale. That is, in very small districts, costs per pupil tend to rise as enrollment decreases. Figure 11 presents a typical economies of scale curve as estimated from Texas school finance data in 2001. Several studies indicate that costs do rise in larger districts, yielding a U-shaped pattern overall. Almost all studies have found some degree of economies of scale at the district level. For recent studies using a U-shaped cost function the estimated minimum cost is between 2,000 and 6,000 pupils depending on the type of expenditures.[11]

The economies of scale pattern for Missouri districts is less well pronounced, and somewhat differently balanced than in some other states. The Missouri school finance formula makes no explicit adjustment for economies of scale. Missouri is among 9 states with significant rural areas that do not aid small districts to compensate for economies of scale (Idaho, Iowa, Kentucky, Mississippi, Missouri, New Hampshire, Tennessee, Virginia, Wisconsin). Differentiation of general revenues for Missouri school districts is a function of (a) poverty adjustments, (b) differences in local effort and (c) assessed valuation (for those districts above the guarantee). The carry over of the formula poverty weight to tax rates applied above $2.75 (line 14b) provides additional incentive for higher poverty districts to increase levies.

Figure 11
Typical Economies of Scale Curve



Source:

Again, Missouri's neighbor to the west is a sharp contrast regarding the balance between district cost driven revenue adjustments and student need driven revenue adjustments. Figure 12 displays Kansas districts general revenues per pupil by district size. In Kansas, adjustments for student needs, while existent in the aid formula, have negligible effects on districts' general revenues. Note the lack of variance in revenues among Kansas large districts, despite significant variance in need (between, for example, Kansas City and Blue Valley). Kansas does have a very pronounced scale curve. In fact,

[11] M. Andrews, W. Duncombe, and J. Yinger, "Revisiting Economies of Size in American Education: Are We Any Closer to a Consensus?" *Economies of Education* Review 21 (2002): 245-262.

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numerous prior analyses indicate that policy decisions made in 1991 – 1992 underlying the design of the Kansas low enrollment weight led to a significantly *over-pronounced* scale adjustment.[12]

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Figure 12
Kansas General Revenues by Enrollment

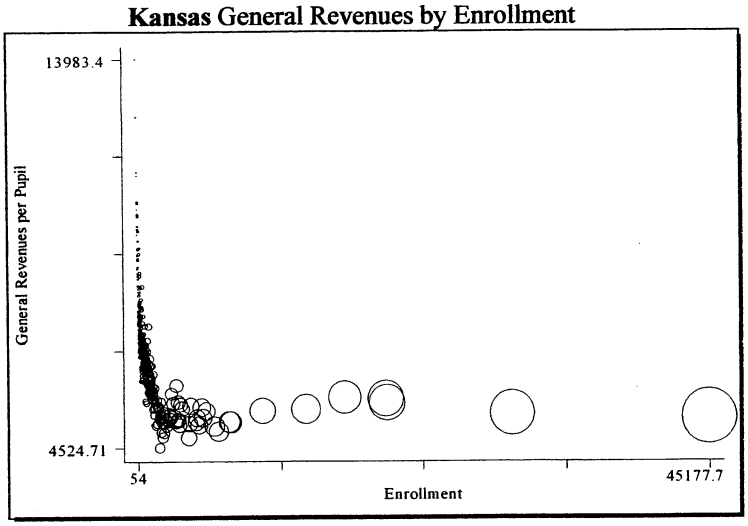

Figure 13 shows Missouri districts' average general revenues compared with U.S. average district revenues for different size categories in 2001. Figure 13 is simply a graphic representation of data previously presented in Table 3. Added to the figure are curved trendlines generalizing the economies of scale patterns for general revenues. Again, Missouri's small and mid-sized districts seem to fair less well than their peers nationally, creating a substantially different scale curve for Missouri than is present nationally. Indeed, the present scale pattern in Missouri may be acceptable if Missouri smaller districts happen to be organized differently from their peers nationally so as to be far more cost efficient. Such dramatic differences, however, seem unlikely.

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[12] Baker, B.D., Imber, M. (1999) "Rational Educational Explanation" or Politics as Usual? Evaluating the Outcome of Educational Finance Litigation in Kansas. *Journal of Education Finance* 25 (1) 121-139. Baker, B.D. (2003b) Wide of a Reasonable Mark: Evaluating the Suitability of the Kansas School District Finance and Quality Performance Act. Expert testimony on behalf of plaintiff districts in *Montoy v. Kansas*. http://www.ku.edu/~bdbaker/Montoy.doc. Baker, B.D. (2003a) Favoring District Needs over Student Needs: The Impact of the Kansas School District Finance Act on Minorities and Children with Disabilities. Expert Testimony in the Case of Robinson v. Kansas. http://www.ku.edu/~bdbaker/kansas/robinson.zip

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Figure 13

Missouri vs. U.S. Average General Revenues per Pupil by Size Category

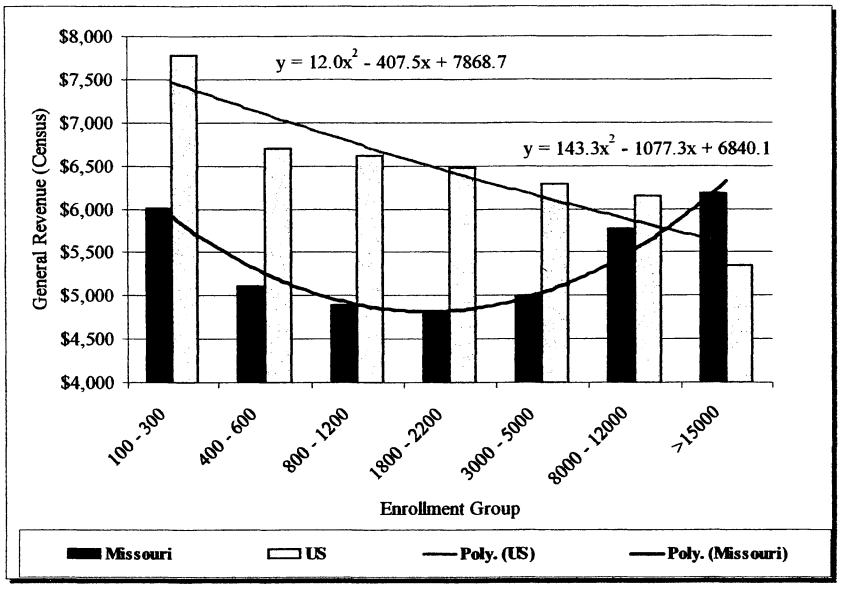

Figure 14 displays the relationship between assessed value per pupil (2003) and general revenues per pupil in 2003. As indicated by the previous correlation analyses, this relationship is relatively strong and positive. Mitigating the relationship somewhat are the position of Kansas City and St. Louis, which each have relatively low assessed valuation, but relatively high revenue per pupil. Note that this is in part a function of higher minimum required tax rates resulting from desegregation litigation. The strength of the wealth-revenue relationship may be of significant concern.

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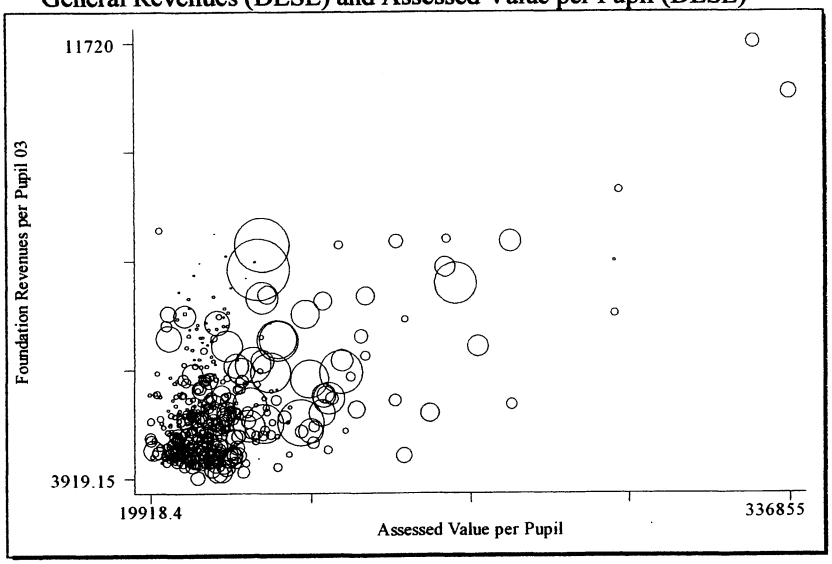
Figure 14

General Revenues (DESE) and Assessed Value per Pupil (DESE)



A question that emerges from the initial visual analyses regarding economies of scale and the previous figure regarding property wealth neutrality is whether small districts in Missouri are disadvantaged by lack of sufficient property tax base? Figure 15 displays the relationship between district enrollment and assessed value per pupil. The figure clearly indicates higher assessed value per pupil in the state's larger districts. As a result, while very small districts (those that are small by necessity) may have higher operating costs per pupil, they appear to systematically have less capacity to raise revenue to cover those costs.

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Figure 15

Relationship between District Size and Assessed Value per Pupil

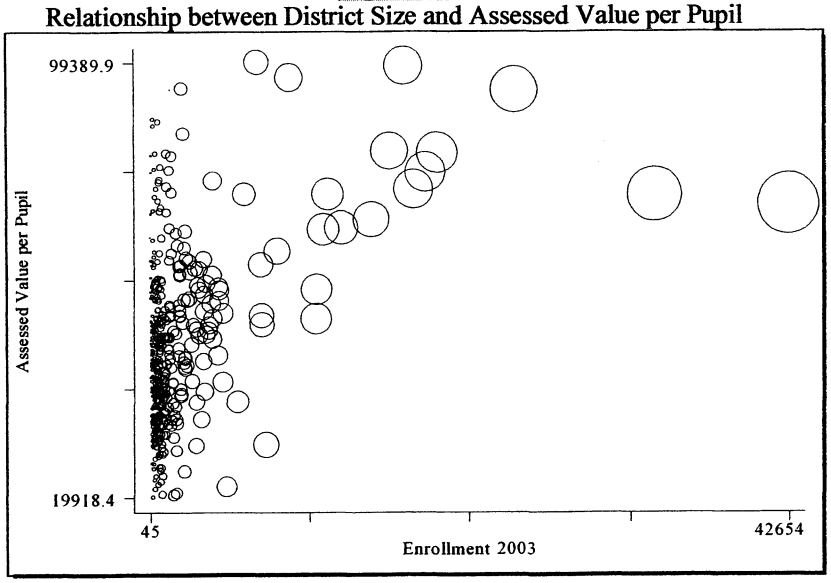

Figure 16 displays the relationship between median household income and revenues per pupil. Within the figure, which shows a weak overall relationship, a handful of patterns are apparent. Setting aside Kansas City and St. Louis, among the large districts, there appears to be a positive relationship between income and revenue. Including Kansas City and St. Louis, it appears that the relationship is negative. Smaller districts appear clustered in the lower left hand corner of the graph – with low median household income and low revenues per pupil.

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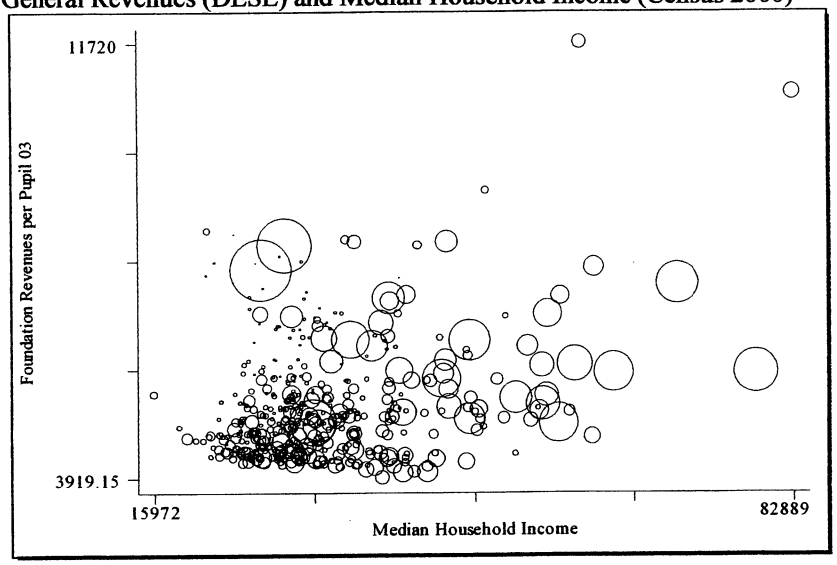
Figure 16

General Revenues (DESE) and Median Household Income (Census 2000)



Data sources: Expenditures from DESE finance file. Median Household Income (MHI) from Census 2000 special tabulation

Figure 17 displays the relationship between revenues per pupil and percent of children from 5 to 17 living in poverty. Among larger districts, including Kansas City and St. Louis, there appears to be a strong positive relationship between poverty and general revenues (with a few exceptions in the upper left corner). Confirming previous suspicions however, smaller districts with more children in poverty do not appear to have much, if any more revenue per pupil than their lower poverty peers. That is, the aid formula appears to yield much less supplemental support for rural poverty than for urban poverty.

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Indeed the poverty adjustments in the aid formula are the same for both large and small districts. There are a handful of factors that may explain the differences in urban versus rural poverty effect. First, urban poverty compensation occurs mainly in two districts – Kansas City and St. Louis. Much of that compensation is made up through required increases in local taxes. Second, even if those local tax rates were not required to be higher, the state's rural areas tend to have low fiscal capacity, reducing the likelihood that particularly poor rural areas will increases local taxes above $2.75 and reap the benefits of second tier poverty adjustments (Line 14b). Without sufficient knowledge of the relative costs of achieving desired outcomes in Missouri's rural and urban districts, it is difficult to discern at this point whether this issue is significantly problematic.

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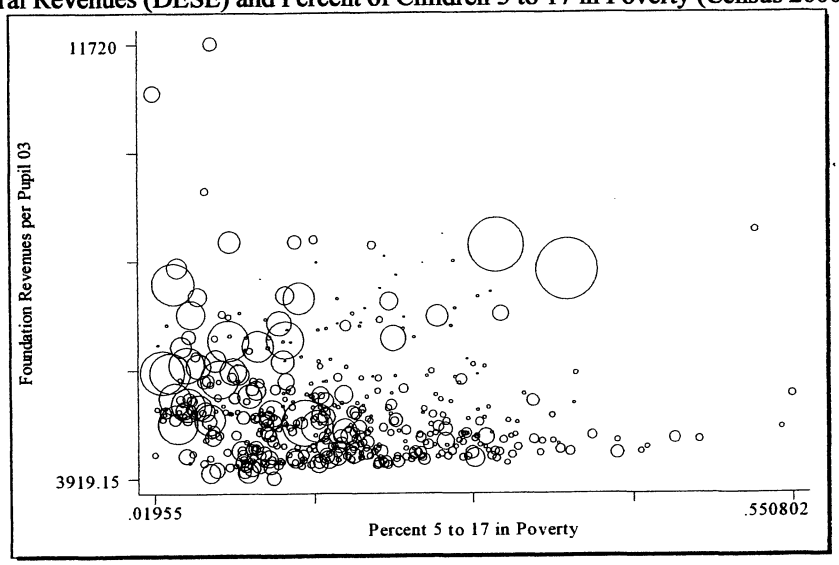
Figure 17

General Revenues (DESE) and Percent of Children 5 to 17 in Poverty (Census 2000)



Data sources: Expenditures from DESE finance file. Percent of children 5 to 17 living in poverty from Census 2000 special tabulation

Summary:

- ✓ **Visual inspection reveals a strong, positive relationship between assessed value per pupil and revenues per pupil.**
- ✓ **Small, rural districts appear disadvantaged by the wealth-revenue relationship in that small districts tend to have lower assessed value per pupil in Missouri. In addition, economic theory suggests that smaller districts tend to have higher per pupil costs.**
- ✓ **Perhaps partly as a function of their lacking fiscal capacity, leading to lower operating levies and less second tier poverty aid, smaller districts appear to reap less marginal benefit from formula poverty adjustments.**

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Table 11
Correlations

K-12 Districts Only	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
State and Local Revenue per Pupil										
Median Household Income(a)	0.0552	0.1297*	0.0929*	0.0501	0.0578	0.2138*	0.1835*	0.2089*	0.2229*	0.1984*
Median Housing Unit Value(a)	0.1023*	0.1958*	0.1670*	0.1349*	0.1370*	0.3037*	0.2776*	0.3074*	0.3286*	0.3103*
Percent 5 to 17 Speak English "Not Well" or "Not at All"(a)	0.5263*	0.4866*	0.4937*	0.5084*	0.5125*	0.4539*	0.4729*	0.4232*	0.3581*	0.3284*
Percent Identified ELL(b)	0.5473*	0.5766*	0.5731*	0.5812*	0.5322*	0.5162*	0.4776*	0.5152*	0.4865*	0.4871*
Percent Minority (c)	0.6459*	0.6578*	0.6594*	0.6585*	0.6155*	0.5855*	0.5763*	0.5882*	0.5855*	0.5787*
Percent 5 to 17 in Poverty(a)	0.2816*	0.2290*	0.2602*	0.3069*	0.2848*	0.1568*	0.1698*	0.1565*	0.1191*	0.1231*
State and Local Revenue per Pupil (no SPED)										
Median Household Income(a)	0.0709	0.1485*	0.1123*	0.07	0.0771	0.2330*	0.1982*	0.2250*	0.2374*	0.2144*
Median Housing Unit Value(a)	0.1174*	0.2144*	0.1864*	0.1546*	0.1560*	0.3227*	0.2927*	0.3233*	0.3429*	0.3270*
Percent 5 to 17 Speak English "Not Well" or "Not at All"(a)	0.5238*	0.4815*	0.4890*	0.5048*	0.5083*	0.4469*	0.4680*	0.4171*	0.3532*	0.3229*
Percent Identified ELL(b)	0.5383*	0.5644*	0.5626*	0.5711*	0.5216*	0.5025*	0.4712*	0.5050*	0.4779*	0.4756*
Percent Minority (c)	0.6442*	0.6553*	0.6575*	0.6565*	0.6142*	0.5822*	0.5770*	0.5878*	0.5859*	0.5757*
Percent 5 to 17 in Poverty(a)	0.2685*	0.2126*	0.2442*	0.2904*	0.2695*	0.1411*	0.1601*	0.1448*	0.1100*	0.1132*
State and Local Revenue per Pupil (no SPED/CAP)										
Median Household Income(a)	0.1001*	0.0729	0.1028*	0.0759	0.1310*	0.2030*	0.1314*	0.056	0.1498*	0.1749*
Median Housing Unit Value(a)	0.1823*	0.1581*	0.1746*	0.1386*	0.1676*	0.2911*	0.2352*	0.1253*	0.2316*	0.2633*
Percent 5 to 17 Speak English "Not Well" or "Not at All"(a)	0.4603*	0.4352*	0.4635*	0.4675*	0.4582*	0.3561*	0.4220*	0.4083*	0.3348*	0.2865*
Percent Identified ELL(b)	0.5153*	0.4875*	0.5122*	0.5123*	0.4730*	0.4900*	0.4675*	0.5173*	0.4575*	0.4312*
Percent Minority (c)	0.6062*	0.6044*	0.6545*	0.6476*	0.5802*	0.5856*	0.5852*	0.6276*	0.5417*	0.5180*
Percent 5 to 17 in Poverty(a)	0.2234*	0.1953*	0.2352*	0.2494*	0.2013*	0.1395*	0.2078*	0.2752*	0.1501*	0.1114*
Cost Adjusted State and Local Revenue per Pupil										
Median Household Income(a)	0.3165*	0.2631*	0.3422*	0.3182*	0.3700*	0.4635*	0.3845*	0.2970*	0.3561*	0.3866*
Median Housing Unit Value(a)	0.4436*	0.3889*	0.4556*	0.4233*	0.4287*	0.5850*	0.5321*	0.4040*	0.4644*	0.4981*
Percent 5 to 17 Speak English "Not Well" or "Not at All"(a)	0.2754*	0.2351*	0.2773*	0.2270*	0.2003*	0.0223	0.1312*	0.1228*	0.0327	-0.0592
Percent Identified ELL(b)	0.2233*	0.1791*	0.2045*	0.1227*	0.0654	-0.0154	0.0278	0.0711	-0.0033	-0.0864
Percent Minority (c)	0.0802	0.0735	0.1221*	-0.0387	-0.1086*	-0.2569*	-0.1430*	-0.1254*	-0.2399*	-0.3557*
Percent 5 to 17 in Poverty(a)	-0.1383*	-0.1654*	-0.1414*	-0.1891*	-0.2341*	-0.3791*	-0.2549*	-0.1885*	-0.3065*	-0.3851*
Current Instructional Expenditures per Pupil										
Median Household Income(a)	0.0972*	0.1797*	0.1151*	0.0965*	0.1047*	0.1732*	0.1702*	0.1983*	0.1496*	0.08
Median Housing Unit Value(a)	0.1739*	0.2491*	0.1903*	0.1760*	0.1922*	0.2669*	0.2796*	0.3018*	0.2637*	0.2121*
Percent 5 to 17 Speak English "Not Well" or "Not at All"(a)	0.4384*	0.4000*	0.4296*	0.4356*	0.4293*	0.3897*	0.3376*	0.2612*	0.2586*	0.2708*
Percent Identified ELL(b)	0.5629*	0.5465*	0.5664*	0.5408*	0.5164*	0.4570*	0.3997*	0.3782*	0.3440*	0.3457*
Percent Minority (c)	0.6441*	0.6194*	0.6478*	0.6459*	0.5787*	0.4747*	0.4358*	0.3926*	0.3981*	0.4288*
Percent 5 to 17 in Poverty(a)	0.2518*	0.1820*	0.2344*	0.2462*	0.2156*	0.1103*	0.0987*	0.0595	0.0764	0.1124*
Current Expenditures per Pupil										
Median Household Income(a)	-0.0017	0.0619	0.0169	-0.0125	0.0043	0.0503	0.0612	0.1156*	0.0917	0.029
Median Housing Unit Value(a)	0.0765	0.1372*	0.0934*	0.0674	0.0991*	0.1572*	0.1766*	0.2330*	0.2048*	0.1541*
Percent 5 to 17 Speak English "Not Well" or "Not at All"(a)	0.5023*	0.4891*	0.5025*	0.5067*	0.4880*	0.4677*	0.4409*	0.3605*	0.3474*	0.3651*
Percent Identified ELL(b)	0.6020*	0.5954*	0.6046*	0.5818*	0.5988*	0.5747*	0.5366*	0.5200*	0.4967*	0.5267*
Percent Minority (c)	0.6961*	0.6934*	0.7137*	0.7153*	0.6952*	0.6426*	0.6363*	0.5942*	0.6166*	0.6422*
Percent 5 to 17 in Poverty(a)	0.3510*	0.3022*	0.3403*	0.3563*	0.3480*	0.2826*	0.2759*	0.2193*	0.2301*	0.2804*

(a) U.S. Census 2000
(b) National Center for Education Statistics, Local Education Agency Universe Survey
(c) 1997 Census Special Tabulation (NCES)

2.0 Evaluating the Connection between Tax Rates, Tax Effort and Yield

This section explores the equity and rationality of education property taxes in Missouri. Previous studies of Missouri school funding emphasize equity of the revenue yield produced by a penny of tax rate. Under a guaranteed tax base formula with income adjustment, this is one logical approach to evaluating tax equity and rationality. We use visual inspection herein to explore the following issues:

- ✓ Tax Revenue Rationality – Given that the aid formula is designed to reward additional local effort with matching state aid, is the total yield (local revenue and state aid) logically associated with differences in local effort?
- ✓ Tax Equity – Is the property tax system flat, progressive or regressive?

Figure 18 displays the relationship between districts' operating levies and general revenues per eligible pupil. Due to the design of the aid formula, operating levies share a near perfect linear relationship with revenues per pupil, with those districts with wealth above the guaranteed level rising above the diagonal line (greater revenue per pupil than would be yielded at the guaranteed wealth for the same tax rate).

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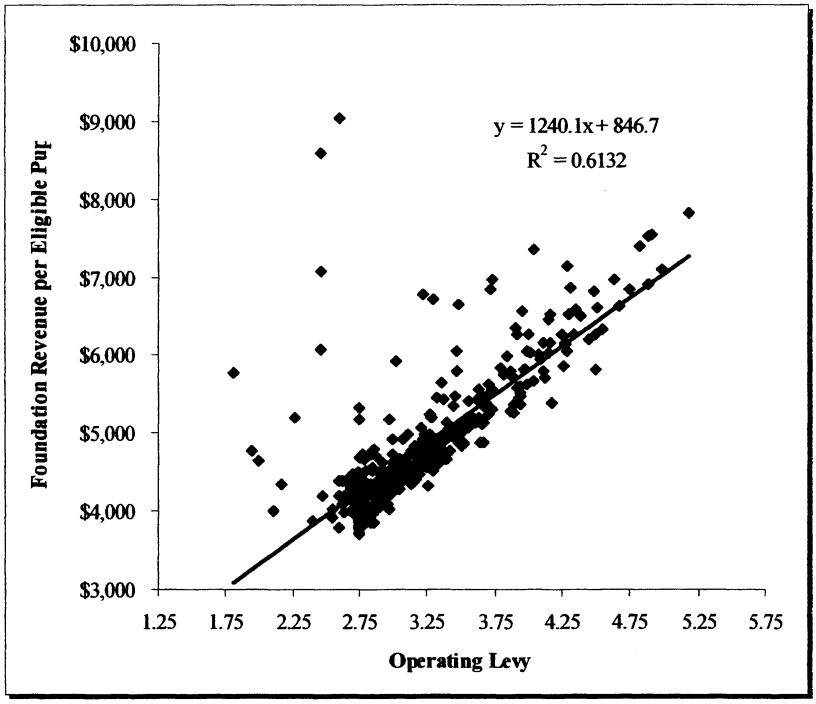
Figure 18
Operating Levies and Foundation Revenues per Pupil



Arguably, property tax levies alone are an insufficient measure of tax effort. As an alternative, we construct an effort measure in which property taxes are expressed as a percent of median household income. To do so, we take the following steps. The tax bill paid by the median voter in each district is assumed to equal the operating levy of that district times the assessed value of the median housing unit. The

tax effort is then the tax bill paid by the median voter divided by the income of the median voter (using households as units throughout).

- Med Tax Bill = (.19 x Median Housing Unit Value[13]) x (Operating Levy[14]/100)
- Effort = Med Tax Bill / Median Household Income[15]

Figure 19 displays the relationship between operating levies and our effort index. In general, districts with higher operating levies also have higher effort, but the relationship is relatively weak (R-squared = .167).

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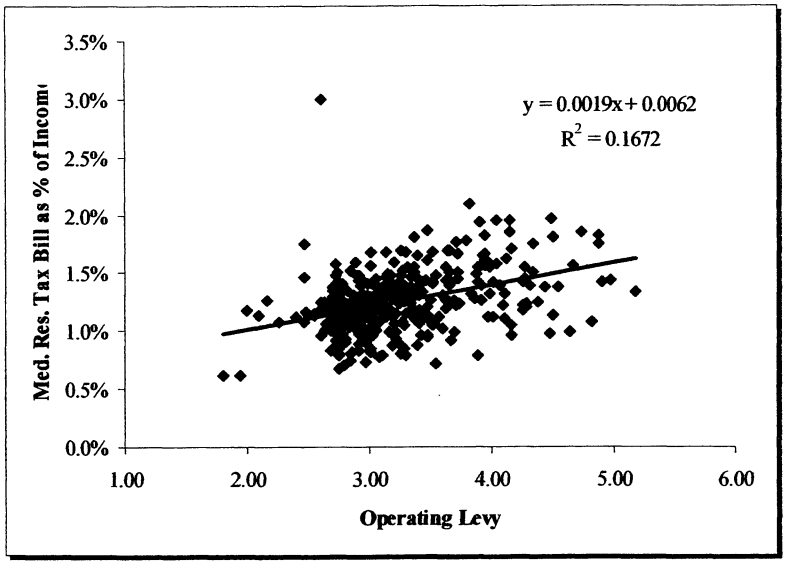
Figure 19

Operating Levies and Median Tax Bill (Residential Housing Unit) as Percent of Median Household Income



Data Sources: MHI & MHU from U.S. Census 2000

[13] Census 2000

[14] DESE, 2003

[15] Census 2000

Ideally, in an aid formula that compensates for both property wealth and median family income, we might expect that for each incremental change in our effort measure, there would be an incremental change in revenues per pupil. That is, greater effort should lead to greater yield. Figure 20 shows that this is generally true, but the relationship between our effort measure and district revenue per pupil is relatively weak. This may be a function of either or both (a) insufficient compensation for income differences in the aid formula or (b) the influence of non-residential property values on tax price.

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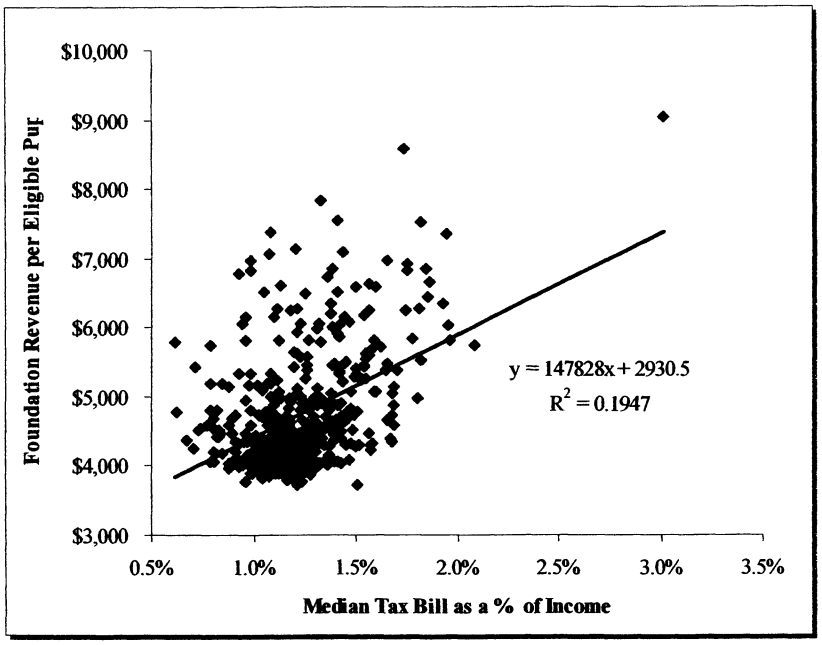
Figure 20

Median Tax Bill (Residential Housing Unit) as Percent of Median Household Income & Foundation Revenues per Pupil



Data Sources: MHI & MHU from U.S. Census 2000

Figure 21 and Figure 22 explore the progressiveness or regressiveness of the base tax levy ($2.75 per $100 assessed value) with respect to median household income. Figure 21 displays the relationship between median property tax bill paid and median household income, revealing a very strong positive relationship whereby higher income households pay larger residential property tax bills from the $2.75 rate.

Figure 21

Median Household Income and Median Residential Property Tax Bill (from operating levy at $2.75)

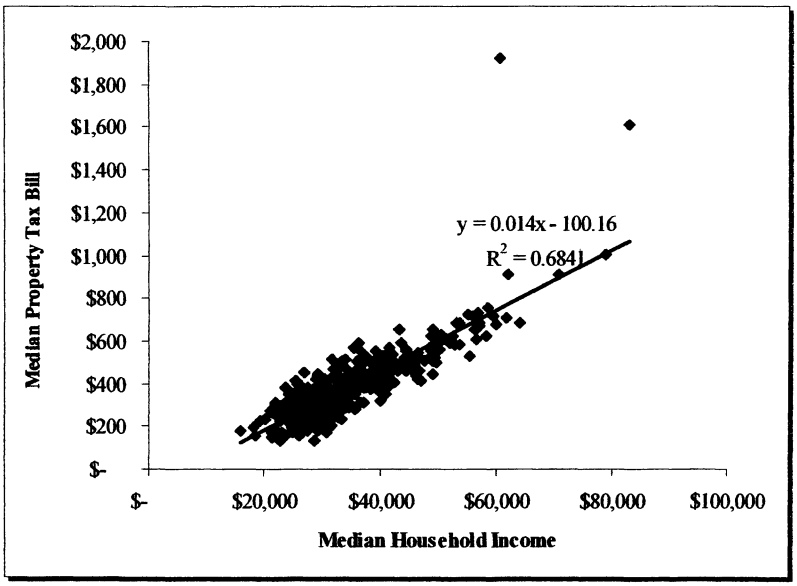


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Figure 22 displays the relationship between median household income and our effort measure, to discern whether effective tax rates (with respect to income) increase or decrease with income. Overall, Figure 22 reveals a relatively FLAT, but somewhat scattered pattern. That is, on average, higher income families appear to be paying about the same percent of their income in school operating taxes (at a given rate) as lower income families.

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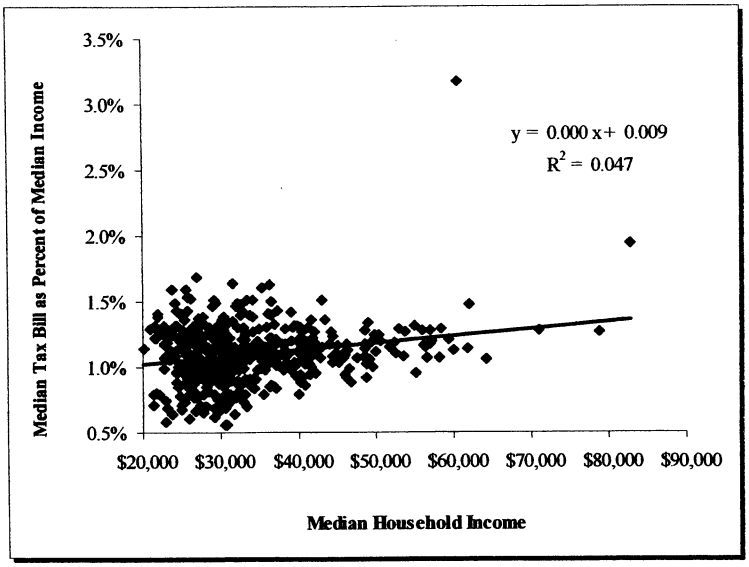
Figure 22

Median Household Income and Median Residential Property Tax Bill (from operating levy at $2.75) as a % of Median Household Income

Income Progressiveness Test



Summary:

- ✓ **Revenue yield appears strongly, logically related to differences in operating levies (as a direct function of the aid formula), but only weakly related to alternative measures of differences in tax effort.**
- ✓ **In dollar terms, high income households appear to be paying higher residential property tax bills for a given operating levy ($2.75), but those tax bills are relatively flat as a share of income across low and high income households.**

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3.1 The Measurement of Educational Adequacy

This section provides an overview of conceptions and measurement of educational adequacy. Missouri legislators are no doubt familiar with the adequacy movement and may have had some exposure to adequacy analysis by way of the independently sponsored study of the cost of an adequate education in Missouri performed by Augenblick and Associates of Denver, CO. We include this section in part to contextualize the Augenblick Missouri cost study. We discuss how the Augenblick study applies two methods from a broader set of available methods for studying the cost of education and we discuss the relative strengths and weaknesses of available methods and recent applications of those methods. This section also may provide useful background information for policy re-design, should the Missouri legislature be interested in conducting an analysis of educational adequacy to serve as the basis for a new aid formula.

Important considerations for undertaking studies of educational adequacy include (a) conceptual, (b) contextual and (c) technical considerations:

- ✓ Conceptual: Is the legislature guided by *input* standards of adequacy or *outcome* standards? That is, does the legislature perceive an adequate education to consist of a prescribed set of educational inputs, such as numbers of teachers per pupil, materials and supplies and facilities? Or, does the legislature perceive an adequate education to be reflected in certain student outcome measures? As will be discussed, some methods for measuring the cost of educational adequacy focus on schooling inputs, while others focus on schooling outcomes. Where a state legislature's emphasis is on achieving adequate outcomes, we argue that the state should make use of outcome based, or performance oriented analyses.

- ✓ Contextual: The political, economic and demographic context of each state is different. Some states are more economically and demographically complex than others. Some states are more political diverse than others. Different methods may work better in different contexts. Key contextual questions include: Is there political consensus around desired inputs or outcomes? Is the state relatively homogenous or heterogeneous in geography, demographics and economics?

- ✓ Technical: Related to the demographic and economic complexity of a state are a variety of technical concerns. Different methods have different technical strengths and weaknesses. Key questions include: If the state is sufficiently heterogeneous, is the method in question sufficiently rigorous for estimating cost variations across districts of different characteristics serving varied student populations? Is there sufficient data for estimating costs and cost variations?

Our initial perception, upon completing our preliminary analyses is that Missouri is a large and relatively complex state, economically, geographically and demographically. As such, complex, rigorous methods may be required to accommodate the diversity of Missouri school districts.

What is an "Adequacy Study?"

For purposes of this report, we define an "adequacy study" as a publicly reported attempt by state officials, special interest groups or independent researchers to apply an empirical methodology to estimate the costs of providing an adequate public education at the elementary and/or secondary level.

Types of Adequacy Studies

Three major categories of adequacy studies presently dominate the landscape. Those categories include:

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Average expenditure studies:

Prior to the 1990s, notions of educational adequacy were often guided by the average or median expenditures of districts in the prior year. A common presumption was that median spending is adequate, and that states should strive to bring the lower half of districts up to the median. [16]

With increased prevalence of state standards and assessments, consultants and policymakers in the early 1990s turned their attention to the average expenditures of districts meeting a prescribed set of outcome standards, rather than the simple average or median of all districts. This approach was coined the *Successful Schools Model.*

Successful schools studies use outcome data on measures such as attendance and dropout rates and student test scores to identify that set of schools or districts in a state that meet a chosen standard of success. Then, the average of the expenditures of those schools or districts is considered adequate (on the assumption that some schools in the state are able to be successful with that level of funding). *Modified successful schools* analyses include some consideration of how schools use their resources. This is done in either of two ways. In most cases, analysts may use data on how schools use their resources to identify and exclude peculiar, or outlier schools or districts from the successful schools sample. Alternatively, one might seek patterns in resource allocation to identify those schools that allocate resources in such a way as to produce particularly high outcomes, with particularly low expenditures. [17]

Resource Cost studies:

The *Resource Cost Model* (RCM) is a method that has been used extensively for measuring the costs of educational services.[18] In general, RCM is a method for measuring costs of services, existing or hypothetical, adequate or not. The RCM methodology typically involves three steps: (1) identifying and/or measuring the resources (people, space, time and stuff) used in providing a particular set of services; (2) estimating resource prices, and price variations from school to school or district to district; and (3) tabulating total costs of service delivery by totaling the resource quantities (resource intensity) and their prices. Resource cost methods have been used for calculating the cost of providing adequate educational services since the early 1980s (Chambers, 1982; 1984).

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[16] For example, a commonly used index of school finance *equity/adequacy* is the McLoone index, which compares the average expenditures of the lower 50% of children with the median expenditures. As "perfect" McLoone index is equal to 1.0, or a situation where no children fall below the median (50% are at the median).

[17] Early successful schools analyses in Ohio used data on district resource allocation as a partial basis for modifying the sample of districts to be used for calculating average costs of achieving standards. Proposed analyses in New York recommend deeper analyses of how successful districts organize their resources. For information on the proposed approach in New York, see Jay G. Chambers, Thomas Parrish, James Guthrie, James Smith (2002) A Proposal for Determining Adequate Resources for New York Public Schools. http://www.cfequity.org/costingoutsummary.pdf

[18] Jay G. Chambers, "Measuring Resources in Education: From Accounting to the Resource Cost Model Approach." Working Paper Series, National Center for Education Statistics, Office of Educational Research and Improvement (Washington, DC: U.S. Department of Education) Working Paper #1999-16, 1999. William T. Hartman, Denny Bolton & David H. Monk, "A Synthesis of Two Approaches to School-Level Financial Data: The Accounting and Resource Cost Model Approaches." In W. Fowler (ed) Selected Papers in School Finance, 2000 – 01. National Center for Education Statistics, Office of Educational Research and Improvement (Washington, DC: U.S. Department of Education, 2001)

Two relatively new (circa 1997) variants of RCM have been specifically tailored to measure the costs of an "adequate" education—*professional judgment* driven RCM and *evidence-based* RCM. The difference between them lies in the strategy for identifying the resources required to provide an adequate education. In professional judgment studies, focus groups of educators and policymakers are typically convened to prescribe the "basket of educational goods and services" required for providing an adequate education. In evidence-based studies, resource needs for staffing and staff development are derived from "proven effective" Comprehensive School Reform (CSR) models like Robert Slavin's *Roots and Wings/Success for All*, that focus on improving educational outcomes in high poverty schools.[19] More recent evidence-based analyses have striven to integrate a variety of "proven effective" input strategies such as class size reduction, specific interventions for special student populations and comprehensive school reform models, rather than relying on a single reform model.

Because evidence based strategies have been recently broadened to include and blend a variety of reform strategies, we adopt the phrase *evidence based* rather than *cost of comprehensive school reforms* to describe the approach. We note, however, that this may lead to a blurred distinction between evidence based and professional judgment models. One might assume, for example, that a panel of well informed professionals would prescribe inputs for schools based at least partly on the professionals' knowledge of research literature on effective reform strategies. The subtle distinction between this and *evidence based* analysis is that evidence based analysis requires an empirical research basis for recommended resource configurations. Further, in evidence based analysis, the recommendation is provided by consultants conducting the cost study, and does not typically include panels of experts from schools and districts in the state.

Statistical modeling studies:

Less common among recent analyses of educational adequacy are statistical methods that may be used either to estimate (a) the quantities and qualities of educational resources associated with higher or improved educational outcomes or (b) the costs associated with achieving a specific set of outcomes, in different districts, serving different student populations. The first of these methods is known as the education *Production Function* and the second of these methods is known as the education *Cost Function.* The two are highly interconnected and—like successful schools analysis—require policymakers to establish explicit, measurable outcome goals.

Education production function analysis can be used to determine which quantities and qualities of educational resources are most strongly, positively associated with a designated set of student outcomes. For example, is it better for a school to have more teachers or fewer teachers with stronger academic preparation at the same total cost to maximize some desired outcome? Further, education production function analysis can be used to determine whether different resource quantities and qualities are more or less effective in districts serving different types of students (economically disadvantaged, English language learners), or in different types of districts (large urban, small remote rural).

Cost function analyses, like production function analyses, use statistical equations. In cost function analysis, the goal is to estimate the cost of achieving a desired set of educational outcomes and further to estimate how those costs differs in districts with certain characteristics, serving students with certain characteristics. For example, achieving state average outcomes in a high poverty urban district may have quite different costs than achieving the same outcomes in an affluent suburb. A cost function that has been estimated with existing data on district spending levels and outcomes, and including data on district and student characteristics, can be used for predicting the *average cost of achieving a desired level of outcomes in a district of average characteristics serving a student population of average characteristics.* Further, the cost function can be used to generate a cost index for each district that indicates the relative cost of producing the desired outcomes in each district. For example, it would likely be found that per pupil costs

[19] Odden, Allan. (2000). Costs of Sustaining Educational Change Via Comprehensive School Reform. Phi Delta Kappan, 81, (6), 433-438.

of achieving target outcomes are higher than average in small, rural districts, that costs are higher in districts with high percentages of economically disadvantaged and limited English proficient children, and that costs are higher where competitive wages for teachers are higher.

The cost function is an extension of the production function where the goal is to estimate directly, in a single model, the costs of achieving desired outcomes, while with a production function, the goal is to identify those inputs that produce desirable outcomes, and subsequently estimate the cost of those inputs. To date, outcome measures used in cost function studies have been narrowly specified, including primarily measures of student achievement in core subject areas.

Placing the Methods on a Continuum

Adequacy study methods may be generally characterized as ***resource oriented*** or ***performance oriented***. This characterization is in part a function of the type of data incorporated into the analyses. Resource oriented analyses focus specifically on categories of educational resource inputs, including numbers of teachers, classrooms of particular dimensions or computers and software required for implementing specific programs. Again, most such studies prescribe resources toward the achievement of specifically identified sets of performance outcomes. Performance studies, on the other hand, focus on measures of student performance outcomes of interest to policymakers, such as test scores or graduation rates. These studies use either tabulation methods (successful schools) or statistical models (cost function) to estimate the costs of achieving those performance standards.

Table 12 summarizes the previously discussed models and their variants on a continuum from ***resource oriented*** (TOP) to ***performance oriented*** (BOTTOM) analysis. Professional judgment analysis where consideration is given only to identifying resources required for providing particular educational programs, regardless of expected or desired outcomes, might be considered *pure resource oriented* analysis. Such analyses would be unlikely in the present policy context. Most recent applications of professional judgment analysis have included at least some discussion of the types of performance outcomes that should result from providing a given set of inputs, most often drawing on outcomes specified in state standards and accountability systems. Often, resource selection is guided by state curricular standards promulgated by legislatures or boards of education on the assumption that particular curricular offerings (core content standards) will lead to desired performance outcomes (often as measured by standardized assessments on core content – e.g. math, reading). Evidence-based analysis, like professional judgment methods, can also be considered resource oriented when professionals' are guided by the need to meet certain outcome standards. As with professional judgment analyses, outcome **data** do not influence directly, *evidence based* analysis.

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At the other end of the continuum are education cost function and successful schools analyses, where performance outcome data drive the estimation of costs. These methods attempt to estimate directly the costs or expenditures associated with schools and/or districts that achieve specific educational outcomes. Cost function analyses differ substantially from successful schools analyses in that they involve much more empirically rigorous attempts to not only determine what levels of present spending are associated, on average, with a specific set of outcomes, but also how those levels of spending may vary for districts of different characteristics serving different student populations.

Toward the middle of the continuum are *hybrid* methods like *modified successful schools*[20] that involve analysis of both student outcomes and the expenditures required to achieve those outcomes, and of

[20] Note that earlier in this document we identified two common approaches to *modifying* successful schools analysis, each of which involves some consideration of how successful schools use their resources. The most common modification, not addressed in this table, is where schools or districts that appear to be outliers in their use of resources are excluded from the calculation of average expenditures. In this table, we refer to those cases where successful schools analysis is used to identify schools achieving success under certain circumstances, and to explore how those schools are using their resources to achieve that success. This is an uncommon use of successful schools analysis, but an approach that is being used in New York State in their ongoing study.

how schools and districts internally organize their resources. Production function analysis, like cost function analysis provides a more empirically rigorous alternative to observation methods like *modified successful schools.* As noted previously, production function analysis might be used to statistically estimate relationships between schooling resources and student outcomes, rather than attempting to discern, by observation, whether there appear to be patterns of similarity in resource use by schools or districts achieving desired outcomes.

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Table 12
Types of Adequacy Analyses

	Model	Research Question	Methodology
Resource Oriented	*Professional Judgment*	What is the total cost of providing students with the "basket of educational goods and services" determined to be "adequate" [for achieving specified outcomes] by a panel of educational experts?	Tabulation of resource quanities (and qualities) and calculation of total cost of purchasing those resources at competitive market prices
Resource Oriented	*Evidence Based Professional Judgment*	Is present funding adequate (and/or how much more is needed) for high poverty and low performing schools to implement *Roots and Wings/Success for All* or other Comprehensive School Reforms or combinations of proven effective strategies (Class Size Reduction)?	Tabulation of resource quantities required for implementing *specific reform strategies* in high poverty schools
Blended Methods	*Modified (Resource Analysis) Successful Schools**	What resource quantities and qualities exist in successful schools? How much would it cost for other schools to have similar resources, or reorganize their resources to be more similar?	Tabulation of resource quantities and qualities of successful schools and estimation of the costs of having similar resources in other schools
Performance Oriented	*Production Function*	Given student population and district characteristics, what resource quantities and qualities are positively associated with student outcomes?	Statistical modeling to determine the relationship between districts' resource quantities and qualities and outcomes produced by those districts, controlling for district and student characteristics, then using market prices to estimate the cost of the optimal input mix.
Performance Oriented	*Cost Function*	What is the cost of achieving a target set of outcomes, in the district of average characteristics serving the population of average characteristics? How does the cost of achieving that set of outcomes vary by district and student characteristics?	Statistical modeling to determine the relationship between district spending and student outcomes, while accounting for factors within and outside the control of local officials (economies of scale, competitive wages, student needs). Simulation using cost function to estimate the "cost of achieving specified outcomes" in districts with varied characteristics, serving varied student populations.
Performance Oriented	*Successful Schools*	How much do schools that meet specific outcome criteria presently spend?	Calculation of the weighted (by enrollment) average spending per pupil of districts meeting outcome criteria

*A form of *Successful Schools Analysis* where the objective is to explore how successful schools use their resources, rather than to calculate the average expenditures of those schools.

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Reconciling the Various Approaches

Since the various methodologies are aimed at the same target—identifying the costs of an adequate education—they should lead to similar predictions about costs, all other things being equal. Ideally, well-informed professionals advising districts on how to meet a specific performance goal would prescribe the same mix of resources as would economists optimizing an educational production function, and that mix, when evaluated at market prices, would cost exactly as much as predicted by a cost function.

Different cost estimates arise when all other things are not equal. The scope of information required to conduct the analysis provides insight into the potential for divergent cost estimates. able 13 summarizes the data demands of the various methods. As the table illustrates, the various methods have very different data needs. For obvious reasons, all of the performance oriented methods require some measure of student outcomes to be able to calculate costs. Professional judgment and evidence-based approaches have no such requirement. However, in professional judgment analysis, researchers might ask professionals to keep a particular performance goal in mind when forming judgments. Further, researchers may evaluate and share with professionals data on current performance of schools and districts at current resource levels. Proponents of evidenced-based analysis posit that reform strategies that have produced positive results elsewhere, on standardized outcome measures, are most likely to achieve the positive outcomes in the state in question, on that state's desired outcome measures. As such, evidence-based analysis requires no direct measure of outcomes within the state in question.

All of the methods with the exception of the Successful Schools approach require information about input prices, particularly educator wages. Ideally, such information represents price variations outside of school district control. Determining the difference between controllable and uncontrollable variations in input prices can be a major analytic challenge for any adequacy studies. We discuss issues of input price estimation and variation later in this report, and in related reports in this series.

Where all of the other methodologies require information on input quantities, the cost function and successful schools analysis require information on total expenditures. (Modified successful schools analysis may require both.) As such, cost-function analysis and successful schools analysis tend to require less detailed financial data than other approaches. The obvious trade-off is that these analytic techniques also offer less information about the optimal level of input quantities.

Table 13 **Data Demands of Various Models**

	Model	Outcomes	Input Quantities	Input Prices	Expenditures
Resource Oriented	*Professional Judgment*		X	X	
Resource Oriented	*Evidence Based Professional Judgment*		X	X	
Performance Oriented	*Modified (Resource Analysis) Successful Schools**	X	X	X	X
Performance Oriented	*Production Function*	X	X	X	
Performance Oriented	*Successful Schools*	X			X
Performance Oriented	*Cost Function*	X		X	X

*A form of *Successful Schools Analysis* where the objective is to explore how successful schools use their resources, rather than to calculate the average expenditures of those schools.

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How do the results vary?

The growing track record on adequacy analysis, replication of analyses in the same states under different sponsorship, and application of alternative methods under the same sponsorship in some states provides us with increased opportunities to compare the results of adequacy studies and assess whether certain patterns exist. Table 3 presents a comparative look, with adjusted dollar figures, for selected available state studies. As a general rule, the table is restricted to publicly available studies sponsored by states or interest groups. However, we also include Imazeki and Reschovsky's cost-function analysis for Texas.[21]

When constructing Table 14, we attempted to make the Table 14 attempts to make adequacy study findings as comparable as was feasible. We adjusted dollar figures for year-to-year and state-to-state differences in the price level using the Consumer Price Index and the National Center for Education Statistics' geographic cost of education index, respectively.

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More importantly, we focused on basic costs associated with a scale efficient (optimally sized) school district. We excluded wherever possible any incremental cost associated with by taking the following steps. First, the goal of the table is to compare, as much as possible, the **basic costs**, excluding additional aid for special student populations. , estimated for operating the *scale efficient* district. In all recent professional judgment studies, basic costs were by Augenblick and associates, this figure was easily identifiable, and most often listed as the total of school and district level costs (before student need adjustments) of a large prototype district. For Picus and associates evidence- based Kentucky study, it was not possible to strip away the student need adjustments, so the cost figure in Table 14 represents the average cost for the least-cost decile of cost scale efficient districts. That is, the cost figure includes the student need adjustments for group of districts of average enrollment at 3,679.[22] As such, this value is overstated relative to the professional judgment Augenblick estimates. Cost function estimates for New York represent the average cost of achieving specified (in parentheses) outcomes in upstate suburban New York districts.[23] While student needs may be low in upstate suburbs, costs associated with student needs (excluding disabilities) are included. As such, New York cost function estimates are overstated when compared with professional judgment estimates. The cost function estimate for Texas represents the cost of achieving average outcomes in the average district.[24] As such, this estimate is most overstated (relative to professional judgment estimates) by including higher cost small districts and by including costs associated with students with special needs.

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[21] The cost function estimate for Texas is drawn from Andrew Reschovsky and Jennifer Imazeki's forthcoming book chapter titled *School Finance Reform in Texas: A Never Ending Story?* Previously presented at the Conference on State Aid to Education, Education Finance and Accountability Program, Center for Policy Research, Maxwell School, Syracuse University. This study was neither state sponsored, nor initiated by a special interest group, but rather, is a product of independent research associated with other partially supported similar research through the Consortium for Policy Research in Education (CPRE) at the University of Wisconsin at Madison. We include the findings of this study in Table 3 on the request of reviewers of this brief, and due to the relatively limited number of available *Cost Function* estimates of educational adequacy.

[22] Average enrollment of lowest cost decile of districts.

[23] Table B-16. Duncombe, 2002.

[24] The cost function estimate for Texas is drawn from Andrew Reschovsky and Jennifer Imazeki's forthcoming book chapter titled *School Finance Reform in Texas: A Never Ending Story?* Previously presented at the Conference on State Aid to Education, Education Finance and Accountability Program, Center for Policy Research, Maxwell School, Syracuse University. This study was neither state sponsored, nor initiated by a special interest group, but rather, is a product of independent research associated with other partially supported similar research through the Consortium for Policy Research in Education (CPRE) at the University of Wisconsin at Madison. We include the findings of this study in Table 3 on the request of reviewers of this brief, and due to the relatively limited number of available *Cost Function* estimates of educational adequacy.

Second, the Consumer Price Index for Urban consumers is used to adjust dollar values to constant, year 2000 dollars. Third, the National Center for Education Statistics geographic cost of education index (NCES GCEI) is used to adjust basic cost findings to at least partially reflect state average differences in competitive wages and other education input prices.

In spite of our efforts to make these figures as comparable as possible, caution is in order. Perhaps most importantly, differing state standards for adequacy will generate differing estimates of the costs of an adequate education. We present the costs of achieving three different outcome standards for New York.

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Table 14
Adequacy Analysis Findings Ranked Low to High
Constant 2000 Dollars, Regionally Cost Adjusted

State	Method	Current Year	Basic Cost (Current Dollars)		Basic Cost (2000 Dollars)	State Mean NCES GCEI	Adjusted Cost (2000 Dollars)
New Hampshire	SS	1999	$ 3,311		$3,406	1.05	$ 3,247
Mississippi	SS	1993	$ 2,614		$3,105	0.87	$ 3,561
Illinois	SS	2001	$ 4,600		$4,462	1.04	$ 4,301
Illinois (Low)	SS	1998	$ 4,470		$4,676	1.04	$ 4,507
Colorado	SS	2003	$ 4,768		$4,464	0.99	$ 4,514
Louisiana	SS	2001	$ 4,234		$4,107	0.90	$ 4,584
Ohio (low)	SS	1999	$ 4,446		$4,574	0.99	$ 4,619
Kansas	SS	2000	$ 4,547		$4,547	0.90	$ 5,059
Illinois (High)	SS	1998	$ 5,103		$5,338	1.04	$ 5,146
Missouri	SS	2003	$ 5,664		$5,303	0.95	$ 5,565
Ohio (high)	SS	1999	$ 5,560		$5,720	0.99	$ 5,777
Maryland	SS	2000	$ 5,969		$5,969	1.02	$ 5,853
Nebraska	PJ	2002	$ 5,845		$5,561	0.89	$ 6,248
North Dakota	PJ	2003	$ 6,005		$5,623	0.89	$ 6,318
Texas (Mean)	CF	1997	$ 5,610	(a)	$5,974	0.95	$ 6,321
Montana	PJ	2002	$ 6,048		$5,755	0.91	$ 6,336
Kentucky	EV	2003	$ 6,130		$5,740	0.90	$ 6,408
Colorado	PJ	2003	$ 6,815		$6,381	0.99	$ 6,452
Kansas	PJ	2000	$ 5,811		$5,811	0.90	$ 6,466
Maryland	PJ	2000	$ 6,612		$6,612	1.02	$ 6,484
Washington	PJ	2003	$ 7,992		$7,483	1.04	$ 7,200
Indiana	PJ	2002	$ 7,094		$6,750	0.94	$ 7,215
New York (140)	CF	2000	$ 8,423	(b)	$8,423	1.13	$ 7,471
Wyoming	PJ	1997	$ 6,450		$6,869	0.92	$ 7,500
New York (150)	CF	2000	$ 8,652	(b)	$8,652	1.13	$ 7,675
Missouri	PJ	2003	$ 7,832		$7,333	0.95	$ 7,695
New York (160)	CF	2000	$ 9,032	(b)	$9,032	1.13	$ 8,012
Wisconsin	PJ	2002	$ 8,730		$8,306	0.96	$ 8,674

a) Average cost in 1996 – 97 of achieving average outcomes in 1996-97 (for all districts with K-12 enrollment and ADA > 1across all scale00.)

b) Indicates the cost of achieving the designated performance standard in parenthesis for *upstate suburbs* presently below the specified standard. Average performance of upstate suburbs below the 140 standard was 130, below the 150 standard was 146 and below the 160 standard, was 149.

SS= Successful Schools
PJ= Professional Judgment
EV= Evidence Based
CF=Cost Function
S= Includes Special Education staffing costs

It is readily apparent in Table 14 that studies employing successful schools methods have produced the lowest estimates of the cost of an adequate education (after adjustments for inflation and regionally price differences). Resource oriented methods like professional- judgment and evidence- based methods produced consistently higher results. However, we stress again that the successful schools approach (which by construction uses a performance standard that some schools already meet) may estimate the cost associated with a lower performance standard than the one implicit or explicit in the other methodologies.

Cost function findings for Texas and New York vary substantially. New York findings indicate the sensitivity of the cost function to changing outcome standards.

Table 15 summarizes findings of cost studies where the same researchers examined alternative methods on the same state in the same year. In four cases, the firm of Augenblick and associates conducted both professional judgment and successful schools analyses. In all four cases, successful schools analyses produced much lower basic cost figures than professional judgment analyses. In one case, the consulting firm of Picus and associates performed both professional judgment analysis and evidence-based analysis. While they do not report a specific basic cost figure (preferring instead to discuss total state budget impact), they do indicate finding higher costs per pupil under the professional judgment model, where inputs are dictated by panels of experts than under the evidence based model where inputs are dictated by comprehensive school reform packages.

Finally, Duncombe and Lukemeyer (2002) in an independent analysis,[25] compare versions of professional judgment analysis, successful schools (which they call empirical observation) analysis and an education cost function. Duncombe and Lukemeyer generate the lowest cost estimate using the professional judgment model and the highest estimate using the cost function model.[26] However, their professional judgment estimate reflects only the wage costs associated with staffing needs, while the other two models include non-personnel costs. If non-personnel costs and benefit expenses exceed 15 percent of the school district's budget, then again the professional judgment model yields the highest cost estimates and the successful schools approach the lowest cost estimates.

Table 15

Comparison of Findings (Current Dollars) from Alternative Models where Analyses were Performed by The Same Consultants

State	Author	Year	Professional Judgment		Successful Schools	Evidence Based	Cost Function
Maryland	Augenblick	2001	$6,612		$5,969		
Kansas	Augenblick	2001	$5,811		$4,547		
New York	Duncombe	2002	$8,352	(a)	$8,468		$9,532
Colorado	Augenblick	2003	$6,815		$4,654		
Missouri	Augenblick	2003	$7,832		$5,664		
Kentucky	Picus	2003	Higher			$6,130	

(a) includes only staffing cost analysis

Table 16 summarizes cost findings from states where similar methods were performed by different researchers or policymakers. The most intriguing findings in Table 2 are for Ohio, where various constituents continue to duel over which group of schools to claim as successful, and use as the basis for calculating costs. The findings for Ohio represent analyses prepared by the Governors office using 43 districts meeting 20 of 27 1999 standards, the Senate using 122 districts meeting 17 of 18 1996 standards,

[25] Under the umbrella of the "Education Finance Research Consortium"

[26] William Duncombe and Anna Lukemeyer (2002) Estimating the Cost of Educational Adequacy: A comparison of approaches. Paper presented at the Annual Meeting of the American Education Finance Association, Albuquerque, NM.

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the House using 45 districts meeting all 18 original standards in 1999, and the House again in an amended bill using 127 districts meeting 17 of 18 1996 standards in 1996 and 20 of 27 standards in 1999. In Illinois, consultants provided 40 separate successful schools cost estimates for unified districts, varying widely on the basis of outcome standards and other inclusion criteria leading to a range of over 14%. Results in New Hampshire vary similarly, also varied as a function of both varied different outcome standards and varied different rules for including and excluding districts on the basis of resource allocation.

Findings of reported professional judgment and evidence-based analyses are less directly comparable. In Maryland, for example, the state's consultants and special interest consultants dealt differently with costs associated with special education. Table 16 compares minimum adequacy costs for Maryland in each study, excluding children with disabilities. In Kentucky, per pupil basic costs were not reported in the state sponsored professional judgment analysis, but were in the state sponsored evidence based analysis. In Maryland, the finding of $6,612 was from the state sponsored study, but the legislature eventually chose to adopt (for 5 year phase in) the even lower finding from the successful schools analysis. In Kentucky, the finding of $8,303 came from the state-sponsored evidence-based analysis for large districts. The state-sponsored professional judgment analysis proved even more costly, while the special interest sponsored study produced a lower basic cost per pupil. Note, however, that Picus and associates found lower costs per pupil ($6,130) under the evidence-based model for smaller districts.

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Comment [BB1]: Including each of the various costs in this table seems to make it too confusing, especially for professional judgment studies. Sizes of minimum cost districts vary etc. We can do a more refined comparison in the technical report.

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Table 16
Comparison of Findings from Similar Models where Analyses were Performed by Different Consultants

Successful Schools Studies					
		Governor	*Senate*	*House*	*House Compromise*
Ohio	*1999*	$4,446	$4,481	$5,560	$4,814
		Finding A	*Finding B*	*Finding C*	*Finding D*
New Hampshire (secondary)	*1998*	$5,449	$5,487	$5,245	$4,722
New Hampshire (elem)	*1998*	$4,681	$4,447	$4,287	$4,145
Illinois	*1998*	$4,470	$5,103 *		
Professional Judgment/Evidence Based Studies					
		State	*Independent*		
Maryland	*2001*	$6,612	$7,461		
Kentucky	*2003*	$8,303	$6,551		

*Augenblick generates 40 separate estimates for Unit School districts, 40 for elementary and another 40 for High School. Figures presented are high and low unit school district estimates.

General Strengths and Weaknesses

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This section briefly summarizes the strengths and weaknesses of alternative methods, treated generally as resource oriented or performance oriented:

Resource Oriented Methods

- Strengths:

The primary strength of resource oriented methods, like professional- judgment models or evidence- based analysis, in the policy context is that the methods are relatively simple and transparent and produce easily understood results. That is, resource oriented models *appear* not to involve more complex statistical modeling. Of course, well-designed resource oriented models require researchers to use statistical modeling to determine market prices for educational inputs[27] and professionals frequently rely on statistical analysis to form their opinions, so input-driven models are probably best described as filtered versions of statistical models.[28]

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  - Because achieving consensus regarding desired educational outcomes can be difficult and precise measurement of those outcomes even more complicated, one advantage of resource oriented analyses is that they avoid these complexities altogether. Professional judgment approaches can also incorporate outcomes that are difficult to measure, while outcomes-based analyses can only estimate the costs associated with measurable outcomes.

- Weaknesses:

  - In an era of increasing emphasis on educational standards and accountability, it can be difficult to justify a cost figure for an "adequate education," where that cost figure is, at best, speculatively indirectly linked to student outcomes.

  - While proponents of "evidence based" analysis infer a strong connection between specific comprehensive school reforms and improved outcomes, research evidence regarding the effectiveness and more specifically the cost effectiveness of these reforms is mixed at best.[29] Furthermore, there may be little connection between the outcomes such reform models are "proven" to accomplish and the outcomes policymakers hope to achieve.

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[27] It is important to note that one critical phase in ***well developed*** resource cost modeling is the setting of competitive market prices for educational resources, and the estimation of how those prices vary from one district to another in a state. This phase is best performed via statistical modeling not too unlike cost function modeling. See Jay G. Chambers, "Patterns of Variation in the Salaries of School Personnel: What Goes on Behind the Cost Index Numbers?" *Journal of Education Finance* 25 (1999a): 255

[28] It is important to note that one critical phase in ***well developed*** resource cost modeling is the setting of competitive market prices for educational resources, and the estimation of how those prices vary from one district to another in a state. This phase is best performed via statistical modeling not too unlike cost function modeling. See Jay G. Chambers, "Patterns of Variation in the Salaries of School Personnel: What Goes on Behind the Cost Index Numbers?" *Journal of Education Finance* 25 (1999a): 255

[29] See Henry M. Levin (2002) The Cost Effectiveness of Whole School Reforms. Urban Diversity Series No. 114. Eric Clearinghouse on Urban Education. Institute for Urban and Minority Education. Geoffrey D. Borman and Gina Hewes (2002) The Long-Term Effects and Cost Effectiveness of Success for All. *Educational Evaluation and Policy Analysis* 24 (4) 243 – 266 and Geoffrey Borman, Gina Hewes, Laura Overman and Shelly Brown (2003) Comprehensive School Reform and Achievement: A Meta-Analysis. *Review of Educational Research* 73 (2) 125-230. Robert Bifulco, Carolyn Bordeaux, William Duncombe and John Yinger (2002) Do Whole School Reform Programs Boost Student Performance? The Case of New York City. Smith-Richardson Foundation.

For practical reasons, resource oriented analyses rely on a limited set of prototypical districts, which can lead to problems when actual school districts differ from the prototypes. For example, it can be difficult to estimate the costs of operating a district with 600 pupils, when prototypes have been estimated with 200 pupils and 1000 pupils. Similar issues exist in the accommodation of student needs, where only a limited range of possibilities may be feasibly represented in the prototypes. The greater the difference between the prototypes and the actual schools, the greater the margin for error. Even apparently subtle differences in applying the prototypes to the real world (such as choosing to interpolate between prototypes linearly instead of nonlinearly) can lead to significantly different cost estimates.[30]

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- Resource oriented analyses frequently prescribe sharp increases in resource utilization, but tend to presume that implementing such changes will have no effect on resource prices. If the increase in demand resulting from the new intensity requirement drives up the price of inputs, then the total cost predictions from the analysis will be greatly understated.

In summary, with resource oriented analysis, you know the mode of transportation you're going to take, but you're not sure exactly where you're going.

Performance Oriented Methods

- Strengths:
  - The primary strength of performance oriented models is that they establish a direct link between education costs and desired outcomes. Understanding the link between costs and outcomes and designing aid formulas based on this understanding is arguably a critical objective in an era of increased emphasis on standards and accountability.
- Weaknesses:
  - A central difficulty of performance oriented analysis involves the politics of achieving consensus regarding *important outcomes* and the empirics of precisely measuring those outcomes. Many outcomes that policy-makers consider important may be too difficult to measure, and that which is measured well may be a biased representation of that which we hope to achieve.
  - The cost and production function approaches are data intensive, requiring high quality measures of school district performance and expenditures. Many states lack the necessary data to conduct such analyses. For example, Maryland does not collect detailed data on school expenditures. Thus, although the state of Maryland was able to identify 104 schools that it considered to be successful, researchers conducted a Successful Schools analysis on a narrower sample of less than 60 schools on the grounds that it would be difficult to obtain fiscal data from the full 104 within the time available. Cost or production function analysis on the basis of such a small sample would be problematic.

A difficulty with more complex statistical methods like education cost functions is that both the underlying methodologies and eventual outcomes of those methodologies can be difficult to understand and difficult to communicate to constituents. The underlying methodologies may rest on theoretical and analytical assumptions with which informed parties may disagre

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[30] In Kansas, for example, differences in aid resulting from applying linear segments between Augenblick and Myers prototypes and applying a curved *expenditure* function of similar high-low range exceed 10% across some ranges (See Appendix D for a comparison using Kansas data).

- By design, statistical models describe relationships within the experience of the data. It is problematic to extrapolate beyond that experience to predict the costs associated with a level of performance that is not regularly achieved, or is not achieved by districts with a particular set of geographic and demographic characteristics.

- While performance oriented methods like cost functions estimate a statistical relationship between spending and outcomes they do not provide specific insights into how districts should internally organize their resources to effectively and efficiently produce outcomes.

In summary, with performance oriented analysis, you know where you're going, and how much money it should take to get there, but you're not quite sure of the best way to go.

Specific issues with existing applications

Review of the vast array of existing adequacy studies raises additional, more specific methodological and practical concerns. These concerns arise primarily from the geographic, demographic and organizational complexity of large states such as Missouri. Table 17 summarizes the extent that existing adequacy analyses have included direct estimates of cost variations by district types or by student needs. That is, has an empirical basis been established not only for the basic level of spending, but also for various cost adjustments that must be applied to that base? Again, professional judgment studies dominate the studies reviewed for this report at 15 (excluding Oregon's Quality Education Model) with successful schools analysis second at 9. We include academic cost function analyses for comparison purposes.[31]

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Table 17

Summary of selected costs directly measured or estimated in existing studies

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	Analytical Method			
	Professional Judgment	Evidence Based	Successful Schools	Cost Function
Total Number of Studies Reviewed	**15**	**3**	**9**	**3**
District Cost Factors				
Input price variation	0	0	1	3
Economies of scale	9	0	0	3
Student Cost Factors				
Children with disabilities	12	0	1	2
LEP children	11	2	1	3
Economically disadvantaged children	11	2	2	3
Migrant children	1	0	0	0
Gifted children	1	0	1	0

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Input Price Variations

An important aspect of any adequacy study is proper controls for price variations that are beyond the control of school districts. The lack of such controls is a common failing among the existing applications. Among professional judgment studies reviewed, none employed *comprehensive* statistical analyses of wages or other input prices. The original Wyoming study and 2001 follow up included a review and critique of existing indices available in that state. Neither evidence based analysis considered input price variations. Only 1 successful schools analysis considered input price variations.[32] The Wyoming study appears to have relied primarily on existing wage and/or cost of living indices in that state.

[31] We count only three cost function studies though, excluding replication and/or related analyses by researchers on a single state.

[32] In a separate report, Kenyon College economist Bruce Gensemer performed "expenditure function" analysis, a statistical approach similar to cost function analysis, to estimate the relative costs of serving children with special needs and relative costs of doing business in different parts of the state of Ohio.

By design, education cost- function analyses include measures of resource price variation across districts. It should be noted, however, that many academic cost function studies use either teacher and other staff salaries[33] or the National Center for Education Statistics Geographic Cost of Education Index (NCES GCEI) as their input price measure,[34] rather than estimating more precise input price indices to isolate price variations outside the control of local district officials.

In some cases, lack of sufficient data may have been at issue. Price analyses of the primary educational input—labor—require detailed information on compensation. Such data can be costly to collect and analyze.

Geography may also play a role in the apparent omissions. In small, homogeneous states, there may be little reason to believe that input prices vary significantly across school districts, and therefore little reason to invest in a full-blown model of price variation. In lieu of conducting their own price studies, several professional judgment studies recommended adoption of the NCES GCEI.[35] Such an approach can be questionable, particularly in rural areas. Keller and Taylor (2003) find that the NCES GCEI for rural Texas is not especially well correlated with geographic cost indexes estimated from Texas data. Duncombe et al. (2003) also conclude that the NCES GCEI is not a good predictor of the CEI they estimate from New York data.

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Economies of Scale

Of the existing professional judgment studies, it is a relatively recent development that those studies include attempts to measure costs associated with economies of scale. In total, 9 of 15 professional judgment analyses have attempted to capture costs associated with economies of scale.[36] These studies have estimated costs of 3 to 5 prototypical districts of varied size, assuming linear changes in costs between the prototypes. These attempts have produced widely varied results, even in contiguous states. The same team of consultants found that costs were minimized in districts with 12,500 students (Nebraska), 11,200 students (Kansas), 5,200 students (Colorado), 4,380 students (Missouri) and 1,740 students (Montana). In Nebraska, a district with 400 pupils had costs 40 percent above the minimum, but in Missouri a district with 364 pupils had costs only 9 percent above the minimum. Evidence based and successful schools studies have not included attempts to estimate costs associated with economies of scale. As a standard, education cost functions include district size measures, typically resulting in a curved pattern showing costs of producing outcome minimized for districts with 2,000 to 5,000 pupils[37] and sweeping sharply upward for very small districts with fewer than 300 or 100 pupils.

Students with Disabilities

As with economies of scale, it is a relatively recent occurrence that professional judgment analyses attempt to capture the costs associated with providing additional resources necessary for serving children with disabilities. 12 recent professional judgment studies have specifically tabulated those resources under

[33] See, for example, William Duncombe and Anna Lukemeyer (2002) Estimating the Cost of Educational Adequacy: A comparison of approaches. Paper presented at the Annual Meeting of the American Education Finance Association, Albuquerque, NM.

[34] See, for example, Andrew Reschovsky and Jennifer Imazeki (2001) Achieving Educational Adequacy through School Finance Reform. *Journal of Education Finance* 26 (4) 373-396. Reschovsky and Imazeki use the NCES GCEI for their Texas analyses, but construct an index using state data for their Wisconsin cost function.

[35] We discuss concerns with this recommendation in our technical reports to follow.

[36] Including studies in Kansas, Nebraska, Indiana, Colorado, Missouri, Montana, Kentucky (Verstegen) and Wisconsin.

[37] Andrews, M., Duncombe, W., Yinger, J., Revisiting Economies of Size in American Education: Are we any closer to consensus? *Economics of Education Review* 21 (2002): 245.

guidance of expert panels, and 8 of those 12 have separately tabulated resource needs by district size (interaction of scale and special education).[38]

Evidence based analyses have not integrated additional costs associated with serving children with disabilities, perhaps because the comprehensive school reform models in question do not. Authors of some cost function analyses have chosen to include children with disabilities[39] while others have chosen to focus their analyses on regular education operating expenses.[40]

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Other Student Needs

Like children with disabilities, professional judgment analyses in recent years have included tabulations of costs of the additional staff required for serving children from economically deprived backgrounds and for serving children with limited English proficiency. In some cases, separate staffing demands were calculated for these subgroups by district size. Only 1 study has separately considered the costs of providing additional staff for migrant or for gifted and talented children.[41] Cost findings for special student populations under professional judgment models have varied widely, even when methods have been carried out by the same researchers/consultants and when those methods have been applied in contiguous or relatively similar states.[42]

Evidence based analyses in Kentucky and Arkansas addressed additional costs associated with providing additional staffing to meet the needs of at risk and/or limited English proficiency. Specific estimates of how these costs vary across different types of schools or districts, however, were not provided. In general, comprehensive school reform strategies cited in evidence- based analyses, like Slavin's *Success for All,* are designed for use in schools with higher concentrations of economically disadvantaged and/or limited English proficient children. Among successful schools analyses, the Ohio expenditure function analyses did include measures of economic disadvantage. The 1996 Illinois study conducted by a team with Coopers and Lybrand evaluated separately, expenditures of higher and lower poverty schools and districts that met specific outcome standards.

Cost function analyses typically include measures of percentages of children from economically disadvantaged backgrounds and percentages of children who are limited in their English language proficiency. Some more recent cost function analyses have attempted to separately evaluate poverty in urban and rural contexts.[43]

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3.2 Application of Adequacy Analysis to Missouri

As previously mentioned, we consider Missouri to be large, complex state. As identified in our previous analyses, Missouri faces issues of economies of scale. Further, Missouri has significant variations

[38] The 12 include South Carolina, Kansas, Colorado, Montana, Kentucky (both Verstegen and Odden and Picus professional judgment studies), Indiana, Maryland, Missouri, Nebraska, North Dakota and Wisconsin. Those including the interaction between scale and special education include Kansas, Nebraska, Indiana, Montana, Colorado, Missouri, North Dakota and Kentucky (Verstegen).

[39] See, for example, William Duncombe and John Yinger (1998) School Finance Reforms: Aid Formulas and Equity Objectives. *National Tax Journal* 51 (2) 239-263. See also, Reschovsky and Imazeki, 2001.

[40] See Duncombe and Lukemeyer, 2002.

[41] Verstegen's study of Kentucky, 2003.

[42] See technical report comparing student and district cost adjustments derived from professional judgment and cost function analyses.

[43] See William Duncombe and Jocelyn Johnston (in press) The Impacts of School Finance Reform in Kansas: Equity is in the Eye of the Beholder. In *Helping Children Left Behind: State Aid and the Pursuit of Educational Equity.* J.M. Yinger (Ed.) (Cambridge, MA: MIT Press).

in poverty across districts. Finally, Missouri has two major metropolitan areas with sharply contrasting poor urban centers and significant suburban wealth.

Augenblick and Myers, under contract with the *Missouri Education Coalition for Adequacy* implemented two methods to estimate the cost of an adequate education – professional judgment and successful schools. As discussed, professional judgment analysis is based on assumptions of an adequate set of education inputs. That set of inputs is generally determined by panels of educational experts with the intent of measuring the cost of achieving a given set of outcomes. Augenblick and Myers note:

> In order to calculate the cost of an adequate education in Missouri, A&M needed to have a specific definition of what that constituted. We began by reviewing Missouri legislation, specifically S.B. 380. After analyzing the different aspects of this bill, including the Show-Me Standards and the Missouri School Improvement Program (MSIP), **we defined the meaning of an adequate education in Missouri** (emphasis added). Our definition of an adequate education guided the discussions of our professional judgment panels. It also became the basis for us to work with the Missouri Department of Elementary and Secondary Education in defining successful school districts. This section will review the process of establishing a statewide standard for an adequate education. (p. III – 1)

It is important to note that in the above paragraph, Augenblick and Myers explicitly state that **they, the consultants** and not the Missouri legislature itself, defined the standards that guided their subsequent analyses. As such, cost of input estimates derived by Augeblick and Myers constitute the cost of implementing standards they, themselves determined.

As indicated in Table 14, Augenblick and Myers input based adequacy estimate for the scale efficient (large) district in Missouri is the 3rd highest (regionally and inflation adjusted) cost estimate produced in existing adequacy studies. The two higher estimates include the *high adequacy standard* estimate of the cost of outcomes for New York and an independent analyses of costs in Wisconsin. Legislative sponsored studies using input based analyses in Wyoming, Maryland and Kansas also produced relatively high cost figures, but much lower figures than in Missouri.

A variety of other shortcomings plague the Augeblick and Myers input based (professional judgment) analysis of the cost of an adequate education in Missouri:

- ✓ An overarching issue is that Augenblick and Myers attempted to characterize the diversity of schooling in the state of Missouri with prototypes of only 5 different size K-12 school districts. We find it difficult to imagine that accurate cost estimates of the wide variety of existing Missouri districts can be fully characterized by estimating costs in a sample of hypothetical cases that represents about 1% of the actual cases.

- ✓ Estimates for the cost differences associated with district size in Missouri are erratic, out of line with even their own scale estimate in other states. This is particularly true for the dramatic drop in scale weight from the district with 130 pupils to the district with 364 pupils and lack of difference between the district with 364 and district with 1,196 pupils.

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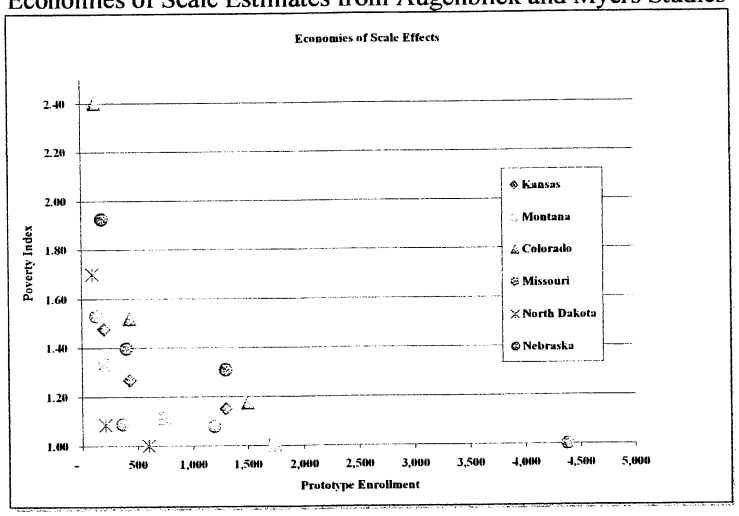
Figure 23

Economies of Scale Estimates from Augenblick and Myers Studies



✓ Similarly, the poverty weights in the Missouri adequacy study are inconsistent with other Augenblick and Myers studies, showing a drop in relative costs of accommodating poverty in larger districts.

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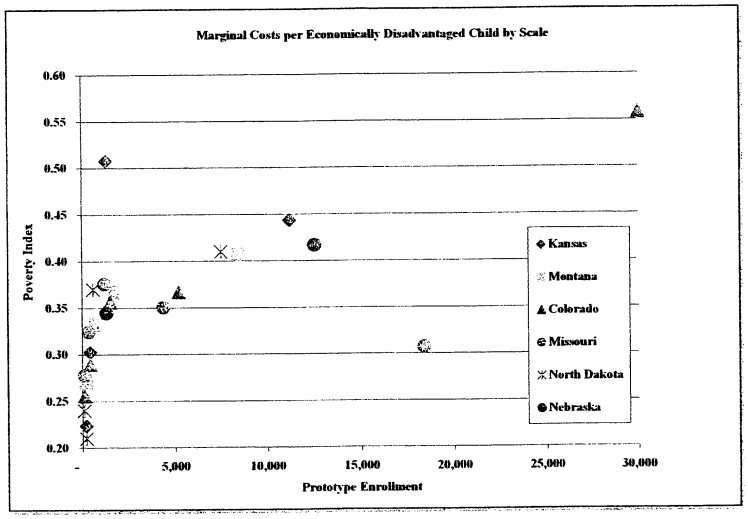
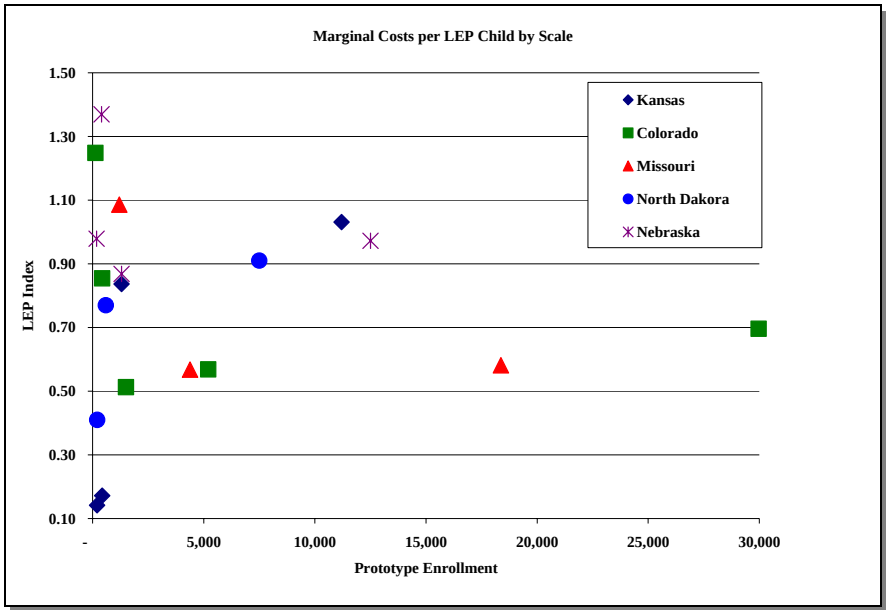
Figure 24



✓ Similarly, costs associated with children with Limited English Proficiency are erratic for Missouri and well out of line with other Augenblick and Myers studies.

Figure 25



- ✓ Finally, recall that input based analyses is built on understanding the quantities AND THE PRICES of required resources. We have previously noted the necessity to conduct rigorous analysis of the relative price of teachers across Missouri districts. Accurate price estimates are critical for accurate cost estimates. Augenblick and Myers failed to perform any type of competitive wage analysis for Missouri school districts, relying only on state average salaries from 2001 – 2002 for districts of varied size.

Augenblick and Myers successful schools analysis of Missouri produced a cost figure over $2,000 lower than the professional judgment analysis. However, successful schools analysis is deeply flawed in number of ways. First and foremost, successful schools analysis fails to account in any way for differences in costs across districts. In short, successful schools analysis is like estimating the cost of producing a given yield of crop on only the most fertile fields (and assuming that the current yield is acceptable). As such, cost estimates derived from successful schools analysis are not worthy of further discussion.

Comparisons of Current Revenue to Augenblick and Myers Professional Judgment Study

Acknowledging the methodological shortcomings of Augenblick and Myers cost estimates derived from professional judgment, this section compares current formula revenues to those estimates. While the estimates themselves may or may not reflect the cost of meeting the legislative standard of adequacy, comparisons of current revenues with A&M estimates may help to reveal which districts presently have the most and which have the least adequate funding.

Table 18 compares districts' general revenue by size to A&M costs by size. Consistent with our previous findings Missouri's smaller districts appear to have less adequate funding that Missouri's larger districts.

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Table 18

Enrollment	Actual General Revenue	Recommended by Prototype	% Adequate
130	6,944 (110 – 150)	11,986	57.93%
364	5,317 (340 – 380)	8,519	62.41%
1196	5,197 (1180 - 1220)	8,411	61.79%
4380	5,205 (3880 - 4880)	7,832	66.46%
18370	6,044 (>10,000)	8,161	74.06%

Table 19 displays the effects of the A&M poverty adjustment by district size. Similar to Table 18 and consistent with our previous findings, Missouri's small districts appear to receive the least sufficient poverty adjustment.

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Table 19

Enrollment	Actual Weight/ Flat Grant	A&M Weight	% Adequate (supp. Only)
130	0.2 (x GTB x $2.75) = $655 in 1999	.28 x 11,986	19.50%
364	0.2	.32 x 8,519	24.00%
1196	0.2	.38 x 8,411	20.50%
4380	0.2	.35 x 7,832	23.90%
18370	0.2	.31 x 8,161	25.90%

Missouri presently has no adjustment for language proficiency status. Table 21 compares the sum of general revenues (at required minimum tax rate) and LEP adjustments to A&M estimates of the cumulative cost of educating a LEP child in five states. Calculations are made for only large districts (or the lowest cost district size). Note that A&M indicated a cost of $0 for LEP children in small districts in Missouri. In 2001 – 2002, under the A&M estimates, a large district would require base funding of $7,832. Each LEP child would cost an additional $4,746 for a total of $12,578 per LEP child. At the base tax rate of $2.75 with a guaranteed wealth of approximately $140,000, base revenue in a Missouri district would be $3,836. With no adjustment for LEP, that would amount to 31% of the A&M cost estimate.

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Table 21

Comparison Across States of A&M Adequacy Estimates for ELL (Scale Efficient District)

State	"Adequate" Basic Aid	"Adequate" ELL Adjustment	Adequacy for ELL Child	Basic Allotment in Aid Formula	ELL Adjustment in Aid Formula	Base Revenue per ELL Child	Percent Adequate
Kansas	$ 5,811	$ 5,993	$ 11,804	$ 3,955	$ 744	$ 4,699	40%
Colorado	$ 6,815	$ 4,837	$ 11,652	$ 4,202	$ 400	$ 4,602	39%
Missouri	$ 7,832	$ 4,746	$ 12,578	$ 3,836	$ -	$ 3,836	31%
North Dakota	$ 6,005	$ 6,046	$ 12,051	$ 2,287	$ 300	$ 2,587	21%
Nebraska	$ 5,845	$ 5,682	$ 11,527	$ 4,814	$ 1,204	$ 6,018	52%

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Comparison to Preliminary Cost Function Indices

We have undertaken some exploratory cost function analyses to discern which districts presently have the most and least adequate funding. To do so, we constructed an education cost function model in which we used combined reading and math MAP performance indices as our outcome measure. With our cost model, we simulate the cost of achieving state median outcomes on the combined MAP index. The cost model assumes the standard form for such models, using state general revenue data as the dependent variable and creating an index of relative efficiency by comparing predicted performance outcomes to actual performance outcomes at districts current spending levels. We control for a variety of student population characteristics that may influence the cost of achieving target outcomes, and for district structural characteristics such as economies of scale.

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The statistical approach is very similar to our approach back in Table 10, in which we estimated whether current revenues were associated with a variety of cost and fiscal capacity characteristics. The key difference is that the cost model in this section addresses student outcomes, and controls for whether districts achieve their current outcome levels efficiently or not. Ultimately, the goal of the model is to be able to estimate what the costs of achieving a given set of outcomes would be, for each district, assuming that district to function at average efficiency. That is, we don't want to assume higher costs of outcomes simply because a district presently spends inefficiently. Again, these findings are preliminary, and the cost model is far from fully developed, with shortcomings discussed at the end of this section.

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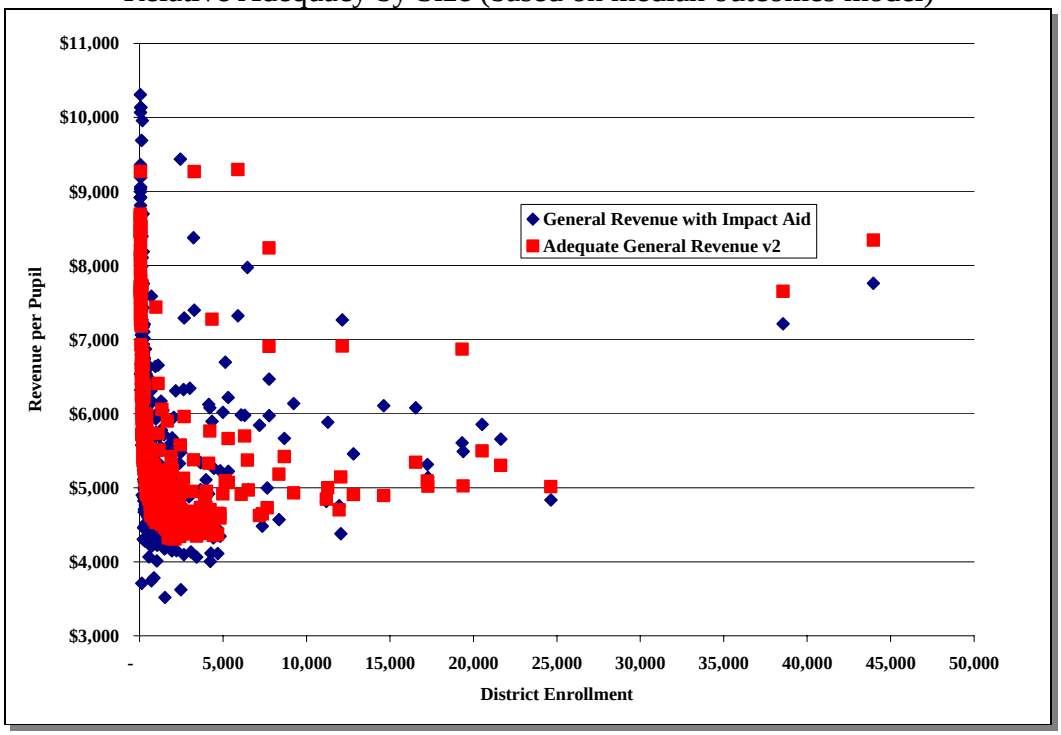
Figure 26 compares current general revenue (U.S. Census) with predicted "adequate revenue for median outcomes" by district size. A notable feature of Figure 26 is that while the predicted costs of median outcomes at average efficiency are very high for Kansas City and St. Louis, the actual general revenues for those districts are quite close to the costs. This is a striking feature of Missouri school finance that differs substantially from other states such as New York, in which the state's largest city has arguably the least adequate funding with respect to cost, or even Kansas, where Kansas City, KS has arguably the least adequate funding with respect to cost. That said, it remains questionable whether the state should require Kansas City to levy a higher tax rate to achieve the same outcome standard of adequacy.

Figure 26
Relative Adequacy by Size (based on median outcomes model)



The next series of tables attempt to use the cost function analysis to identify those districts with the least adequate current (2001) general revenues per pupil. Note that because this cost function is preliminary, findings may change. At this point, the goal is to identify general patterns of similarity among districts identified as having the least, and most adequate funding given their needs. Table 22 identifies those districts with the largest percentage deficit from adequacy. Note that most are relatively small, except Riverview Gardens and University City. In general, there are two clusters of districts on the list – 1) small rural districts with only a few hundred students and 2) poor urban fringe districts, generally surrounding St. Louis. We note that through many iterations of our cost model, this finding has held constant.

Districts like Wellston, University City, Normandy, Jennings and Riverview Gardens that face labor costs (for comparable quality staff) comparable to Ladue and Clayton and student needs comparable to St. Louis, simply lack sufficient resources or the local capacity to raise them.

Table 21

20 Least Adequately Funded (% difference)

District Name	Enrollment	Median Household Income	Percent Minority	Percent Urban	Percent 5 to 17 in Poverty	Percent ELL	Adequacy Deficit v2 (%)	Adequacy Deficit v2 ($$)
PLEASANT VIEW SCH DIST R6	131	$ 40,667	0.9%	5.6%	5.9%	0.0%	-54.0%	$ (2,005)
WELLSTON SCH DIST	715	$ 21,458	98.6%	100.0%	52.0%	0.0%	-51.1%	$ (3,875)
CRYSTAL CITY SCH DIST 47	698	$ 37,886	8.7%	99.3%	11.9%	0.0%	-44.3%	$ (1,658)
LESTERVILLE SCH DIST R 4	295	$ 29,167	5.5%	0.0%	29.9%	0.0%	-41.7%	$ (1,866)
CARUTHERSVILLE SCHOOL DIST 18	1,569	$ 19,375	33.4%	98.4%	45.2%	0.0%	-32.1%	$ (1,433)
CHARLESTON SCH DIST R-1	1,365	$ 23,354	36.0%	62.3%	36.6%	0.0%	-31.0%	$ (1,434)
BRADLEYVILLE SCH DIST R 1	253	$ 29,167	4.5%	0.0%	29.0%	0.0%	-30.9%	$ (1,330)
ST CLAIR SCH DIST R 13	2,475	$ 39,760	3.4%	43.7%	11.9%	0.0%	-29.2%	$ (1,058)
DELTA SCHOOL DISTRICT C-7	271	$ 25,000	18.9%	0.0%	22.4%	0.0%	-27.8%	$ (1,390)
RIVERVIEW GARDENS SCHOOL DIST	7,343	$ 33,744	65.3%	100.0%	21.9%	0.0%	-27.4%	$ (1,771)
EXETER SCH DIST R 6	341	$ 27,136	5.6%	36.3%	18.3%	0.6%	-27.0%	$ (1,155)
NORMANDY SCH DIST	5,698	$ 30,404	82.1%	100.0%	25.6%	0.0%	-27.0%	$ (1,974)
SALEM SCH DIST R 80	1,604	$ 24,469	1.6%	73.4%	24.3%	0.0%	-26.9%	$ (945)
BAYLESS SCH DIST	1,438	$ 40,297	4.7%	100.0%	5.1%	4.3%	-25.5%	$ (1,063)
HAYTI SCH DIST R 2	990	$ 15,972	54.0%	94.6%	55.1%	0.0%	-25.4%	$ (1,507)
JENNINGS SCH DIST	3,158	$ 27,134	80.8%	100.0%	30.9%	0.0%	-25.3%	$ (1,873)
UNIVERSITY CITY SCH DIST	4,366	$ 40,570	50.7%	100.0%	21.6%	0.0%	-23.4%	$ (1,379)
GASCONADE SCHOOL DISTRICT C-4	116	$ 24,259	4.6%	0.0%	25.6%	0.0%	-22.9%	$ (1,276)
PORTAGEVILLE SCHOOL DIST	924	$ 29,242	14.9%	72.7%	26.5%	0.0%	-22.7%	$ (982)
NEELYVILLE SCH DIST R-4	676	$ 26,543	7.2%	0.0%	20.4%	0.0%	-22.6%	$ (950)

Table 22 presents the districts with the largest dollar deficits to adequacy. Members on the list are ostensibly the same as Table 22.

Table 22

20 Least Adequately Funded ($ difference)

District Name	Enrollment	Median Household Income	Percent Minority	Percent Urban	Percent 5 to 17 in Poverty	Percent ELL	Adequacy Deficit v2 (%)	Adequacy Deficit v2 ($$)
WELLSTON SCH DIST	715	$ 21,458	98.6%	100.0%	52.0%	0.0%	-51.1%	$ (3,875)
PLEASANT VIEW SCH DIST R6	131	$ 40,667	0.9%	5.6%	5.9%	0.0%	-54.0%	$ (2,005)
NORMANDY SCH DIST	5,698	$ 30,404	82.1%	100.0%	25.6%	0.0%	-27.0%	$ (1,974)
JENNINGS SCH DIST	3,158	$ 27,134	80.8%	100.0%	30.9%	0.0%	-25.3%	$ (1,873)
LESTERVILLE SCH DIST R 4	295	$ 29,167	5.5%	0.0%	29.9%	0.0%	-41.7%	$ (1,866)
RIVERVIEW GARDENS SCHOOL DIST	7,343	$ 33,744	65.3%	100.0%	21.9%	0.0%	-27.4%	$ (1,771)
CRYSTAL CITY SCH DIST 47	698	$ 37,886	8.7%	99.3%	11.9%	0.0%	-44.3%	$ (1,658)
HAYTI SCH DIST R 2	990	$ 15,972	54.0%	94.6%	55.1%	0.0%	-25.4%	$ (1,507)
CHARLESTON SCH DIST R-1	1,365	$ 23,354	36.0%	62.3%	36.6%	0.0%	-31.0%	$ (1,434)
CARUTHERSVILLE SCHOOL DIST 18	1,569	$ 19,375	33.4%	98.4%	45.2%	0.0%	-32.1%	$ (1,433)
DELTA SCHOOL DISTRICT C-7	271	$ 25,000	18.9%	0.0%	22.4%	0.0%	-27.8%	$ (1,390)
UNIVERSITY CITY SCH DIST	4,366	$ 40,570	50.7%	100.0%	21.6%	0.0%	-23.4%	$ (1,379)
BRADLEYVILLE SCH DIST R 1	253	$ 29,167	4.5%	0.0%	29.0%	0.0%	-30.9%	$ (1,330)
SWEDEBORG SCH DIST R-3	75	$ 28,750	3.8%	0.0%	28.6%	0.0%	-20.4%	$ (1,289)
GASCONADE SCHOOL DISTRICT C-4	116	$ 24,259	4.6%	0.0%	25.6%	0.0%	-22.9%	$ (1,276)
HAZELWOOD SCH DIST R-1	18,855	$ 48,909	37.9%	96.0%	8.1%	1.1%	-22.6%	$ (1,265)
SHAWNEE SCH DIST R 3	67	$ 38,250	1.4%	0.0%	14.8%	0.0%	-17.9%	$ (1,171)
EXETER SCH DIST R 6	341	$ 27,136	5.6%	36.3%	18.3%	0.6%	-27.0%	$ (1,155)
STRAIN-JAPAN SCHOOL DISTRICT R-16	92	$ 43,036	0.9%	0.0%	2.1%	0.0%	-18.0%	$ (1,154)
BAYLESS SCH DIST	1,438	$ 40,297	4.7%	100.0%	5.1%	4.3%	-25.5%	$ (1,063)

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Table 23 presents the most adequately funded districts by percent above the cost of achieving median outcomes. Note that we by no means recommend "leveling down." Rather, we are simply trying to identify those districts that by virtue of the local capacity to raise revenue and/or their relatively low costs of achieving median outcomes (where the two often go together), have sufficient revenue per pupil (by the relatively low standard we have set – median outcomes on MAP).

As one might expect, Ladue and Clayton top the list of adequate revenues, along with an interesting mix of small city/large town districts, and a handful of very small districts.

Table 23

20 Most Adequately Funded (% difference)

District Name	Enrollment	Median Household Income	Percent Minority	Percent Urban	Percent 5 to 17 in Poverty	Percent ELL	Adequacy Deficit v2 (%)	Adequacy Deficit v2 ($$)
CLAYTON SCH DIST	2,452	$ 60,554	17.9%	100.0%	6.7%	4.8%	40.9%	$ 3,862
LADUE CITY SCH DIST	3,234	$ 82,889	11.8%	100.0%	2.0%	1.2%	35.8%	$ 3,002
PETTIS CO SCH DIST R 12	146	$ 29,550	7.2%	35.3%	15.2%	0.0%	34.8%	$ 3,465
NORTHWESTERN SCH DIST R1	228	$ 29,145	0.7%	0.0%	26.8%	0.0%	33.9%	$ 2,779
NORTH DAVIESS COUNTY SCH DIST R-3	120	$ 29,167	1.3%	0.0%	21.2%	0.0%	33.4%	$ 3,234
PATTONVILLE SCH DIST R 3	6,461	$ 46,521	13.7%	100.0%	8.3%	1.3%	32.6%	$ 2,602
HOWELL VALLEY SCHOOL DIST. R-1	216	$ 31,510	2.2%	17.9%	14.2%	0.0%	31.2%	$ 2,718
BRANSON SCH DIST R 4	2,935	$ 32,098	4.4%	59.6%	16.3%	0.7%	29.1%	$ 1,845
NORTH MERCER SCHOOL DISTRICT R-3	238	$ 25,962	1.8%	0.0%	27.1%	0.0%	28.8%	$ 2,238
JEFFERSON SCH DIST C 123	167	$ 31,985	5.0%	0.0%	30.1%	0.0%	26.0%	$ 2,107
NORWOOD SCH DIST R 1	482	$ 25,250	2.3%	0.0%	37.1%	0.0%	24.6%	$ 1,636
PLATTE CO SCH DIST R-3	2,080	$ 48,992	7.3%	68.2%	4.9%	0.1%	24.2%	$ 1,526
LIVINGSTON CO SCH DIST R3	75	$ 30,667	0.0%	0.0%	19.4%	0.0%	24.0%	$ 2,430
KIRKWOOD SCH DIST R 7	4,984	$ 62,010	5.1%	100.0%	3.9%	0.0%	23.9%	$ 1,600
LAREDO SCH DIST R 7	59	$ 28,611	0.8%	0.0%	32.2%	0.0%	23.4%	$ 2,356
KINGSTON SCH DIST 42	51	$ 25,583	1.9%	0.0%	35.3%	0.0%	22.9%	$ 2,318
NORTH ANDREW SCHOOL DIST R-6	362	$ 35,598	1.9%	0.0%	18.5%	0.0%	22.7%	$ 1,560
MIDWAY SCH DIST R-1	556	$ 52,656	2.9%	0.0%	8.2%	0.0%	22.6%	$ 1,465
RISCO SCH DIST R 2	207	$ 31,705	0.9%	0.4%	17.2%	0.0%	22.4%	$ 1,608
MARYVILLE SCH DIST R 2	1,385	$ 31,906	4.2%	83.2%	8.5%	0.5%	22.2%	$ 1,343

Table 24 presents the districts with the greatest dollar difference above adequacy (for median outcomes).

Table 24

20 Most Adequately Funded ($difference)

District Name	Enrollment	Median Household Income	Percent Minority	Percent Urban	Percent 5 to 17 in Poverty	Percent ELL	Adequacy Deficit v2 (%)	Adequacy Deficit v2 ($$)
CLAYTON SCH DIST	2,452	$ 60,554	17.9%	100.0%	6.7%	4.8%	40.9%	$ 3,862
PETTIS CO SCH DIST R 12	146	$ 29,550	7.2%	35.3%	15.2%	0.0%	34.8%	$ 3,465
NORTH DAVIESS COUNTY SCH DIST R-3	120	$ 29,167	1.3%	0.0%	21.2%	0.0%	33.4%	$ 3,234
LADUE CITY SCH DIST	3,234	$ 82,889	11.8%	100.0%	2.0%	1.2%	35.8%	$ 3,002
NORTHWESTERN SCH DIST R1	228	$ 29,145	0.7%	0.0%	26.8%	0.0%	33.9%	$ 2,779
HOWELL VALLEY SCHOOL DIST. R-1	216	$ 31,510	2.2%	17.9%	14.2%	0.0%	31.2%	$ 2,718
PATTONVILLE SCH DIST R 3	6,461	$ 46,521	13.7%	100.0%	8.3%	1.3%	32.6%	$ 2,602
LIVINGSTON CO SCH DIST R3	75	$ 30,667	0.0%	0.0%	19.4%	0.0%	24.0%	$ 2,430
LAREDO SCH DIST R 7	59	$ 28,611	0.8%	0.0%	32.2%	0.0%	23.4%	$ 2,356
KINGSTON SCH DIST 42	51	$ 25,583	1.9%	0.0%	35.3%	0.0%	22.9%	$ 2,318
NORTH MERCER SCHOOL DISTRICT R-3	238	$ 25,962	1.8%	0.0%	27.1%	0.0%	28.8%	$ 2,238
JEFFERSON SCH DIST C 123	167	$ 31,985	5.0%	0.0%	30.1%	0.0%	26.0%	$ 2,107
BRANSON SCH DIST R 4	2,935	$ 32,098	4.4%	59.6%	16.3%	0.7%	29.1%	$ 1,845
MIRABILE SCH DIST C 1	39	$ 39,063	5.9%	0.0%	25.7%	0.0%	17.8%	$ 1,834
NORWOOD SCH DIST R 1	482	$ 25,250	2.3%	0.0%	37.1%	0.0%	24.6%	$ 1,636
SPICKARD SCH DIST R-2	62	$ 23,125	1.4%	0.0%	42.7%	0.0%	17.3%	$ 1,617
RISCO SCH DIST R 2	207	$ 31,705	0.9%	0.4%	17.2%	0.0%	22.4%	$ 1,608
KIRKWOOD SCH DIST R 7	4,984	$ 62,010	5.1%	100.0%	3.9%	0.0%	23.9%	$ 1,600
NORTH ANDREW SCHOOL DIST R-6	362	$ 35,598	1.9%	0.0%	18.5%	0.0%	22.7%	$ 1,560
RIDGEWAY SCH DIST R 5	129	$ 24,333	0.0%	0.0%	26.1%	0.0%	19.1%	$ 1,528

Shortcomings of the Preliminary Cost Index

Numerous modifications to the present cost indices are required before they can be confidently used to guide policy discussions.

- ✓ First, the legislature must engage in a discussion over the desired outcomes and whether the present system of statewide testing accurately measures those outcomes.
- ✓ Second, a more thorough analysis of competitive input prices and teacher wages is required to estimate more accurately and more precisely the price of recruiting teachers of comparable quality in different regions of the state. The present index likely overstates metropolitan area prices relative to rural recruitment costs and most certainly overstates suburban prices relative to neighboring urban prices.
- ✓ Third, additional explorations of district efficiency and factors influencing efficiency are warranted. The goal is to isolate those inefficiencies that are within the control of local district administrators and boards of education and to limit the extent that those inefficiencies skew our measurement of what it really costs to achieve a given set of outcomes.

Conceptual/Legal Questions

1. Balancing the *Fiscal Planning* and explicit *Sub-adequate Funding* implications of the Proration Factors

   Vulnerability limited by use of only Tier II proration factor

2. Can the state continue to impose different tax levy requirements toward achieving the same "adequacy" standard (cost adjusted Tier I aid)?

If we assume, for example that revenue per pupil in KCMO is adequate. And that in general, adequacy for MO districts is achieved at the $2.75 rate. Is it problematic that adequacy in KCMO is achieved by a state imposed $4.95 rate?

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Part III

Improving Education Finance Efficiency & Effectiveness

As public policy debates over education finance continue across the country, most of the emphasis is on the "adequacy" or "inadequacy" of funding levels for elementary and secondary education. Although the actual funding level in a state is an important issue, how the funding is utilized is of equal importance. Unfortunately, discussions over how funding is spent are secondary to discussions over actual funding levels.

Numerous states have conducted "adequacy" or "costing-out" studies to determine public elementary and secondary education levels. The results of such studies have found that an additional 15-40 percent is required in order for states to meet constitutional requirement of providing an adequate education, and no study has found that there is sufficient or excessive funding elementary and secondary education in a state.

Most of these studies make a significant assumption that the funding within the current system is being spent in the most effective and efficient manner, and additional resources are required. However, as a public education finance policy, one could argue that states should first ensure that taxpayer dollars are being spent in an effective manner and then thoroughly examine student performance before addressing issues regarding whether more money is required. Furthermore, there is no credible research that indicates that by simply increasing education funding that student performance will increase. Specifically, research has shown that simply increasing education funding has no affect on student performance. This is not to say that increases in funding cannot make a difference, but increases in funding must be targeted and spent on proven strategies and programs.

Although answering the question of whether more funding should be provided to elementary and education in Missouri is beyond the scope of this project, it is important to set the context for the following discussion. The purpose of this section is to provide the state of Missouri policy options to consider, which could allow certain non-instructional funds to be redirected to the classroom. It is a reasonable projection that cost-saving strategies for certain products and services can assist the state of Missouri improve education finance efficiency and effectiveness.

The following provides overviews and policy options for the state of Missouri concerning improving purchasing power, Education Service Areas (ESAs), privatization, and improving intervention services under the No Child Left Behind act (NCLB).

Improving Purchasing Power

One of the simplest ways of redirecting significant funding toward the classroom is by reducing the per-unit cost of numerous products and services. According to the Association of School Business Officials (ASBO) and the National Education Association (NEA), school districts spend up to 8 percent of expenditures on supplies and services, producing an annual nationwide total as high as $32 billion. If personnel benefits, transportation, computers, and health benefits provided to special education students are included the figure could easily surpass 25 percent of total education expenditures. Improved purchasing power could redirect tens of millions of dollars to the classroom.

Current Status of Purchasing

Although school districts across the nation and budgets have experienced substantial fiscal growth in recent years, business models for purchasing products and services have been relatively slow to change. School district purchasing traditionally involves a lengthy process of submitting and approving requisitions; advertising for bids; opening bids; selecting suppliers; issuing purchase orders; and arranging for delivery, payment and follow-up.

School districts often have separate purchasing operations that handle various facets of obtaining goods and services. Purchasing operators often are bound by numerous state statutes to seek proposals, set specifications, sign contracts, and track orders---all with local school board approval. These statutes and

regulations are designed to ensure fairness, provide accountability for the use of public funds, and safeguard the system from abuse.

School purchasing officials have reported to the *American School Board Journal* (ASBJ) that among the profession's greatest challenges is staying abreast of changes to the statutes and regulations governing various aspects of the purchasing process and correctly interpreting them.

Using the decades-old traditional purchasing model, school districts have duplicated one another's efforts to create bid specifications for similar products and services that most schools need. Under this paradigm, only the largest districts receive the best prices due to economies of scale. With cooperation among school districts, local governments and state lawmakers, viable alternative purchasing models may be explored.

Exploring Alternative Purchasing Options

By forging collective purchasing agreements and joining purchasing consortia, school districts in a number of states have revealed that a collective presence in the marketplace usually commands better prices on a wide range of goods and services.

Selected examples of this practice include the following examples:

- Idaho has contracted with the Western State Contracting Alliance (WSCA), a regional and national purchasing entity for purchasing computers and related equipment. WSCA membership consists of state procurement officials from Alaska, Arizona, California, Colorado, Hawaii, Idaho, Minnesota, Montana, Nevada, New Mexico, Oregon, South Dakota and Utah, In 1999, WSCA established purchasing agreements for computer equipment with Compaq, CompUSA, Dell, Gateway and IBM. The agreements have been approved for use by all the necessary state governmental entities and public agencies in Idaho. The WSCA agreements initially were negotiated via the New Mexico General Services Department's State Purchasing Division. According to a New Mexico report on the contracts, the initial discounts were projected to save the state and other New Mexico governmental users approximately $1 million per year. Colorado, New Mexico, Nevada,

South Dakota and Wyoming first joined in the agreement. After initial negotiations, Idaho, Oregon, Utah and Washington joined. Later, Arizona, California and Montana joined. By 2001, the organization's participants had grown to include Rhode Island and Vermont state governments and local governments in Connecticut and Maryland.

- Ohio reflects a slightly different approach to purchasing. In Ohio, ten educational purchasing cooperatives are members of the Ohio Council of Educational Purchasing Consortia (OCEPC). These cooperatives vary in size, based on the needs and interests of school district members in the region. There are cooperatives with a few small districts in a small region or county and there are cooperatives with approximately 100 member districts and 200,000 students. The programs offered by each cooperative vary according to the member-district's needs. Each educational purchasing consortium may join OCEPC by paying the $200 annual membership fee. The rules require that the voting member represent a public school district or a council of government that represents public school districts.

- In 2001, Mississippi's Department of Education received an award from the National Institute of Governmental Purchasing (NIGP) for its Cooperative Food Purchasing Project. The state operates a voluntary, statewide, nonprofit food purchasing cooperative for school districts and other organizations that are participating in the National School Lunch Program. This program, which is supported through a Web-based product information and ordering system, is designed to ensure that the correct product in the desired quantity consistently is provided to a specific location on a scheduled basis at the most competitive price. In 1999, the Mississippi cooperative purchased an estimated $80 million in goods and services. The 2001 pricing was 9 percent less than the amount paid for the same products in 1999, representing a savings of approximately $2 million.

- Pennsylvania schools have been purchasing technology-related equipment through a consortium established under a state grant in the 1980s. Since then, the Pennsylvania Education Purchasing Program for Microcomputers (PEPPM) has reportedly made $1.4 billion in purchases in Pennsylvania, creating savings estimated at $336 million. Program membership is extensive, covering 501 Pennsylvania school districts, 94 vocational technical schools, 29 intermediate units, and 34 state-approved private schools and public libraries. While offering schools approved bids that are in compliance with various state bidding laws, the program reportedly reduces administrative time and other expenses associated with the purchasing process. Since its inception, PEPPM has extended its services to California, Colorado, Illinois, Michigan and Texas.

- The New Mexico Research and Study Council (NMRSC) initiated one of the state's cooperative education purchasing efforts, offering member schools bulk savings on paper; school and office supplies; furniture, classroom equipment, and building janitorial and maintenance supplies. In 2002, NMRSC finalized an exclusive contract with Pepsi to provide participating school districts with products and vending services, student, and educator awards, scholarship and marketing revenues, products, and monthly sales commissions. NMRSC reports that the beverage consortium includes forty-three participants that represent approximately 11,000 students. Council officials report that in the contract's first year, participants received $ 1.1 million in revenues. For the same period, NMRSC received $4,135 and reported an increase in membership. Since 2000, NMRSC gradually has transferred its operations to Cooperative Educational Services (CES), which has resulted in modifications such as redesigning program structure and enabling electronic purchasing via the Internet. Still, there have been some challenges to moving the operation online. This agency reported that through collaboration with a liaison computer specialist, challenges surrounding taking the catalogs online and enabling electronic purchasing were surmounted.

It is important to note that all such activities are essentially self -reported with no outside assessments. The investigators were not able to verify the veracity of such claims as audited by state/auditing agencies.

The Maryland Example

In 2000, Maryland's elementary and secondary school expenditures for supplies and materials in the instructional and special education categories totaled approximately $ 90 million, including nearly $ 50 million for textbooks. In 2002, Maryland enacted legislation to facilitate the transition to alternative purchasing models. S.B. 480 allowed local boards of education and private schools to participate in contracts for goods that are awarded by other public agencies or by intergovernmental purchasing organizations, so long as the lead agency for the contract follows public bidding procedures.

The statute expanded the acceptable methods of advertising for bids to better use technology and to expand participation by the state's county boards of education in contracts awarded by other public agencies or by intergovernmental purchasing organizations. Following the law's passage, The Maryland State Department of Education established a Web site for the Maryland K-12 Purchasing Center to focus on the purchasing needs of the state's schools. The site offers state purchasing professionals an opportunity to electronically share information and post news and information.

By directing the Maryland State Department of Education (MSDE) to establish a process to provide information concerning contracts for goods held by public agencies or intergovernmental purchasing organizations, the legislation allowed greater flexibility for elementary and secondary education purchasing operations to be conducted electronically.

Before the statute was passed, if the cost of any school building improvement, supplies, or equipment was more than $15,000, local boards of education were required to advertise for bids in at least one local newspaper at least two weeks before bids were due to be filed. According to one legislative report, this practice cost thousands of dollars annually. For example, one county reportedly spent approximately $6,000 for advertising in 2001. By allowing local school systems to advertise bids through less costly means, overall costs were reduced.

The same report concluded that many of the administrative costs associated with negotiating contracts could be reduced if schools and school systems could use existing contracts that already have been approved. With the legislation's passage, local school districts now can utilize the national and regional intergovernmental contracts and "piggyback" contracts awarded by other governmental agencies. Even before the statute passed, many of Maryland's school districts and local governments had joined cooperative-purchasing groups to obtain volume discounts. The Baltimore Regional Cooperative Purchasing Committee (BRCPC) includes school systems and local governments from several cities and counties. The committee collectively has bought instructional materials, automotive tires, office furniture, electricity and heating oil for participating school systems.

For fiscal year 2000, the BRCPC reported a total savings of $ 1.4 million for its members. In 2002, the committee's Public Schools Group reported three counties had joined in a cooperative bid for paper and saved approximately 2 percent, or $70,000.

Other State Summaries

All the 145 districts that responded to *American School Boards Journal* (ASBJ) survey on purchasing reported that they had experimented with alternative purchasing models and found them to save time and money and to reduce paperwork and administrative burden.

Several approaches to alternative purchasing offer solutions that do not rely upon specialized technology or equipment. Innovative purchasing techniques that reportedly are in use by the large urban and suburban districts that responded to ASBJ's survey employ electronic and non-electronic variations of the traditional purchasing model, including the following.

Electronic Alternatives

- **On-line purchasing**

Used by 43 percent of the districts polled. Patronizes companies that allow schools to compare prices and place orders over the Internet.

- **Electronic bidding and purchasing**

Used by 22 percent of the districts polled. Allows schools to use the Internet to advertise for bids, solicit prices and place orders.

- **Electronic Data Interchange**

Used by 10 percent of the districts polled. Requires school districts and vendors to use compatible computer equipment to handle purchase orders, confirmations, delivery slips and invoices via Internet connection.

Nonelectronic Alternatives

- **Cooperative purchasing**

Used by 73 percent of the districts polled. Typically used by smaller school districts that join for bulk discounts on large quantities of supplies that may require storage space.

- **Direct purchasing**

Used by 67 percent of the districts polled. By purchasing goods directly from the manufacturer, schools can secure better prices on merchandise.

- **Just-in-time purchasing**

Used by 60 percent of the districts polled. Using long-term purchase contracts with confirmed per-unit prices, school districts order goods at various points throughout the contract's duration.

- **Consortium leverage purchasing**

Used by 43 percent of the districts polled. Collective bidding through a state or regional consortium helps to maximize savings on items all schools need.

Missouri Specifics

The state of Missouri does have at least two innovative programs that were identified in our overview:

- Cooperating School Districts (CSD), a nonprofit organization, serves school districts throughout Missouri. The organization provides staff development, cooperative purchasing, legislative services and educational technology to fifty school districts, 490 schools and 300,000 students, which represent

one-third of Missouri's public school population. CSD cooperatively purchases $12 million in products and services annually.

- The Missouri Schools Board Association (MSBA) and CSD have formed a natural gas consortium to deliver natural gas savings to the largest schools in certain areas of the state. Until recently, utility tariffs have prevented more schools from participating. Under H.B. 1402, enacted in 2002, eligible school districts can aggregate natural gas transportation and supply needs through a three-year pilot program that allows schools to collectively purchase natural gas at an estimated 30 percent cost savings.

Options for Missouri

- The state could explore the advantages and disadvantages of joining the national entities as outlined in this paper.
- Missouri could expand upon activities already present in the state and could establish state wide RFPs for a number of products and services, including:
    - Paper, pencils.
    - Computers.
    - Desks,
    - School Buses, and
    - Maintenance supplies and so on.

The statewide contract could be for elementary and secondary schools or could also be for other state agencies and services. The state could then require school districts to purchase certain products through the statewide contract. If districts could purchase products for a cheaper price, they could purchase such, and would simply have to submit documentation to the state. Along similar lines, the state could allow school districts (and potentially other state agencies) to voluntarily purchase other services such as:

- Speech therapy, physical therapy, and other special education medical services,

- Health benefits for education personnel, and
- Natural gas and petroleum.

Education Service Areas

Another cost-saving option for Missouri to consider is the creation of Education Service Areas. This concept could require increased the purchasing power of school districts through multi-district Education Service Areas. Such plans would have to be developed on a cost-benefit basis based on the areas and the needs served.

School districts across the country have sought cost-saving options for the provision of many administrative services. Individual school districts may lack the personnel or fiscal resources to provide administrative or student services without taking resources, time, and moneys away from instruction and teaching. Overwhelming evidence suggests that educational services agencies (ESAs) are a cost-effective way to provide schools and school districts with services and support programs. By working cooperatively, school districts are able to share the cost of programs instead of funding them by individual district. More than forty states have established ESAs during the last forty years, enabling local districts to direct more resources to the classroom and away from administrative and support costs.

A variety of names are given to educational service agencies from state to state, although they essentially function in the same manner. Examples include Educational Service District (ESD), Education Service Unit (ESU), Regional Education Service Agency (RESA), Education Service Center (ESC), Board of Cooperative Educational Services (BOCES), Service Cooperatives (SC), Intermediate School District (ISD), Intermediate Unit (IU), Area Education Agency (AEA), Cooperative Educational Service Agency (CESA), and County Office of Education. Although different regions may refer to their agencies by different names, they all function in similar ways. In many states, these agencies function at the regional level between the state educational agency and the local school district. It may serve as an extension of the state educational agency or it may operate as an independent of both state and local control. Specific information pertaining to individual agencies across the country can be obtained through the American Association of Education Service Agencies' Web site at http://www.aaesa.org/index.html.

ESA Governance and Financing Structures

According to the American Association of Educational Service Agencies, "All educational service agencies that are created by statute have some type of representative governance structure, although it varies from state to state." Examples of boards include publicly elected lay citizens, school board members from local districts, superintendents of local districts, and elected representatives from local school districts. The three basic sources of revenue for EDSs include a local property tax levy, state allocations, and/or contract fees for services provided. In addition, some ESAs apply for and receive grants. Educational service agencies provide shared educational and service programs to member school districts. The agency acts as a cost-saving entity to provide services to two or more school districts that decide they have similar needs that can be met by a shared program. Sharing programs allows the school district to obtain services that it otherwise may not be able to afford independently. Education service agencies can provide programs such as career and technical education, adult/continuing education, special education, alternative schools, programs for students in local schools, early childhood and community services, professional development for teachers, technology services and support services. Among support services, it is reported that these entities are able to provide resources for school/building administration. Data collection, management and use are among of the services provided to school districts. Included are: data analysis, data warehousing, data collection, program evaluation, educational research and special project planning. In addition, professional development and pooling resources to process and access additional Medicaid funding for special education students are provided. Services vary from one organization to another.

How Services Agencies Can Reduce the Cost of Administrative Duties

Service agencies function to:

- Maximize the effectiveness of available moneys through collaborative funding,
- Reduce duplication of programs, personnel and services,
- Assist members to meet responsibilities for mandated programs,
- Contribute to equalizing educational opportunities for pupils in diverse schools,
- Provide for the services of highly skilled resource personnel on a cost efficient basis, and

- Promote inter-district communication and idea sharing attendance centers.

Policy Options for Missouri

Missouri could create ESAs beyond the present one within the state. Such ESAs could be created for various functions, e.g., special education, professional development, and data processing. These ESAs could be on a county basis or other geographic basis. Such an approach bypasses issues of consolidation, but ensures that administrative funding is not too high for smaller districts. Such an approach would call for careful evaluation and study so as to determine the scope and applicability of such a concept and thus make reasonable projections as to the cost-benefit concepts.

Accessing Medicaid Funds

Until 1988, education systems received only limited Medicaid funding for special education. Then, the U.S. Congress passed the Medicare Catastrophic Coverage Act of 1988 to clarify ambiguity over the services covered by Medicaid. Under the act, Medicaid would pay for school-based care for Medicaid eligible students with Individual Education Plans (IEPs). In fact, the law stipulated that Medicaid funding should reimburse medically necessary services before IDEA funds were used. Funding would be provided for health services and administrative activities such as Medicaid outreach, application assistance and transportation. Schools could be classified as either a Medicaid service provider or could contract out for services. Although much of the law was repealed in 1989, the part addressing Medicaid and special education was preserved as an amendment to the Social Security Act.

Fifteen years later, only 44 percent of school districts in the nation receive Medicaid funding for special education. The most current research, based on the 1999-2000 school year, found that Medicaid provided $ 648 million for special education nationwide, with some states receiving more than 5 percent of special education revenues from Medicaid and $500 to $800 per special education student. However, some states are either not receiving any Medicaid funds or are receiving only very small amounts. In addition, although $648 million was provided to states through Medicaid, education systems across the country

submitted $1.5 billion in claims. The reasons that less than half of submitted claims were actually funded provides valuable insight into why so many schools, school districts and states do not file claims.

Reasons for Confusion and Lack of Funding

Confusion over Medicaid funding for special education can be attributed to the fact that there is ambiguity about the services that are covered, documentation of services is complex and rigid, and identification is difficult. In addition, the federal government's lack of guidance has compounded confusion in all these areas. However, there are strategies for states to consider that can help them increase Medicaid funding for special education.

What Services Are Covered?

Every state has a unique Medicaid contract with the federal government, so services that may be covered in one state may not be covered in another. Most state Medicaid programs are housed in the state department of health and human services. Therefore, many education officials are concerned that education services may not be included in the state Medicaid contract.

Documentation and Billing Are Difficult

Unlike hospitals and other health providers that have medical billing departments, most schools and school districts have difficulty finding the necessary resources and personnel to work through the complex maze of Medicaid billing. If documentation that is provided to federal regulators is not in an acceptable format, Medicaid funding is not provided. Given that only $648 million of $ 1.5 billion in claims was funded during 1999-2000, education systems across the country may not have the necessary capacity to maximize Medicaid funding.

Difficulty in Identifying Students

Federal law prohibits schools and school districts from issuing the names of IDEA students to non-education agencies without the consent of parents. Therefore, school personnel have no easy procedure to determine if the special education students they serve also are eligible for Medicaid. Often, school

personnel must follow up with parents to determine eligibility. Given the significant resources needed to do this, many schools and school districts do not attempt to determine if children are eligible for Medicaid.

What States Can Do to Enhance Medicaid Funding for Special Education

Although significant barriers exist to fully accessing Medicaid funding for special education, many of these barriers can be overcome by improving state-level policy. Some strategies that states may wish to consider include the following.

- *Make Sure that Special Education Services Are Covered in the State Medicaid Contract*

States that have successfully in accessed significant Medicaid funding have required departments of education and departments of health and human services to work together. Specifically, department of education personnel can provide those responsible for the state Medicaid contract with valuable information about the types of services covered through special education. Along similar lines, confusion over terminology can impede efforts, and discussions between departments can clarify ambiguities.

- *Provide Department of Education with Names of Medicaid-Eligible Students*

As previously mentioned, schools and school districts cannot release information about special education students without parental consent, making it difficult to identify special education students who are eligible for Medicaid. However, if the Department of Elementary and Secondary Education can create a database of Medicaid-eligible students, local education personnel can then access the data and identify student eligibility.

- *Enhance Capacity for Medicaid Billing*

State personnel could begin a program to train school district personnel in proper billing procedures for Medicaid in order to enhance capacity. Another option states may want to consider is centralizing the services at the state level by creating a division that is responsible for all Medicaid billing for special education. Along similar lines, some school districts across the country contract out billing services to private firms. The state could reduce the percentage that the private firms charge (usually 10 percent to 20 percent of revenues received) by creating a request for proposal (RFP) for a statewide

contract. The increased purchasing power should reduce the percentage charged by private firms to less than 10 percent.

The Center for Special Education Finance found that Missouri currently receives $44 per special education student from Medicaid. This is significantly less than the mean from other states ($194) or the median ($96). Creating a state level processing department or creating an RFP for private providers would have to be justified on a cost-benefit basis. It certainly would be advisable to investigate this entire area with in attempting to reducing state costs and increasing federal costs. Part of this investigation would be to determine if the current state funding would meet the matching requirements of the federal government.

Privatization

Generally, research reflects that any public service delivery is typically 35 to 95 percent more expensive than contracting to a private party, even when the costs of administering the contract were included. In most cases, private firms deliver services more economically than do public organizations. However, whether these generalities are applicable to a public good, such as elementary and secondary education is highly controversial and debatable. If the private contract were for custodial services that is significantly different than, for example, actually teaching public school. Thus, each endeavors has to be careful examined; not only as to the cost-benefit ratio but as to the public good that is involved in such an undertaking. It is also important to note that commentators have long observed that when private service providers do not have to compete, they are just as inefficient as public agencies.

In 1995, the National School Boards Association (NSBA) produced *Private Options for Public Schools: Ways School Districts Are Exploring Privatization* as part of its ongoing "Best Practices" series. The publication, based on a survey that was sent out to 3,000 NSBA member school districts, provided information on the experiences of urban, suburban, and rural school districts nationwide.

Findings from the survey indicate that school districts used private firms for a variety of services, with facilities maintenance, food service, and transportation the services privatized most frequently. In addition, the survey found that "cost savings" was the most common reason school districts privatized.

Interestingly, of the 45 percent of respondents who reported cost savings as the primary reason for privatizing, only one-third indicated that they actually realized cost-savings.

Maximizing the Benefits of Privatization

A number of issues must be addressed when considering privatizing educational services, and addressing these issues in a thorough manner before engaging in privatization will significantly benefit state and local education entities.

Why Do You Want to Privatize?

The most common reason school districts are interested in privatization is cost savings, but other reasons can include improved management efficiency, making available special services that not provided by the school district, or freeing up time for school personnel to concentrate on other areas.

The state of Missouri should encourage school districts to explore privatization of certain support services. If cost savings were the primary catalyst, school districts must conduct research prior to privatization to estimate if cost savings can be realized over time. For example, it might be quite cost effective to privatize a school district's transportation fleet. However, once the transportation fleet has been eliminated the cost to reenter the market becomes prohibitive in that the district cannot buy an entire fleet of buses at one time. Thus, the state must encourage school districts to evaluate and prioritize the issues of privatization where it is reasonable in terms of local decision making.

With uniform reporting school districts can be identified, by the state, as to eligibility for state assisted cost-benefit studies regarding support services. By conducting such analyses, "best practices" can be identified and further developed for all similar school districts.

Policy Options for Missouri

- The state can be instrumental in identifying best practices for a variety of educational services provided by school districts. These could include best practices on contracted services and services provided by school districts. Uniform financial reporting on services is essential to creating benchmarks that can be used by the state and/or school districts.

- The state can create policies and procedures for requesting proposals, evaluating proposals, and administering of contracts. Furthermore, the state can provide technical assistance to school districts on how to implement policies and procedures. Such technical assistance could be provided to individual school districts or to state organizations such as the Missouri Association of School Business Officials Association or Administrators Association.
- Missouri could create a state-level office that would create, evaluate and monitor RFPs. Such an approach could enhance economies of scale for such services as compared to the costs of administration in school districts.
- Missouri can examine regulations over privatization and remove those that may hinder privatization efforts.
- The state could consider requiring certain educational services to be provided through Educational Service Areas and could provide financial incentives for school districts to join such entities.
- The state could provide tax incentives to businesses to encourage them to enter into educational service areas.

Identification and funding of effective "intervention services" under NCLB.

Under No Child Left Behind (NCLB) states are required to provide technical assistance to school districts and schools that do not meet adequate yearly progress (AYP) requirements for two years in a row, and supplemental services (i.e. tutoring, after school programs) to schools and districts that do not meet AYP three years in a row.

A recent study in Ohio estimated that the costs for these "intervention services" would be $1.2 billion a year. Of interest is the fact that only 21 percent of Ohio's schools did not meet AYP, and the federal government was providing $44 million to Ohio under NCLB, or 3.1 percent of estimated need.

Although many states were critical of the initial compliance costs associated with meeting NCLB program requirements, the costs associated with providing these "intervention services" could be significantly higher. Therefore, it is important for states to identify effective strategies and programs that will help ensure that schools and school districts meet AYP requirements. For those schools not meeting

AYP requirements for two or three years in a row, states must have effective intervention services that will help them meet requirements.

Studies from Ohio and other states are finding that intervention services can cost over $1,000 per pupil. By identifying effective strategies early, the state of Missouri could potentially save tens of millions of dollars.

Policy Options for Missouri

- Examine practices in schools that are performing well with high populations of special needs students in order to identify best practices.
- Identify schools that have shown great improvement in test scores and find out what they did, in order to create effective intervention strategies.

These broad areas of efficiency concerning public elementary and secondary education indicate that public education may, by its current design present issues of inefficiency. That is to say, when over 500 school districts exist within the size of the state of Missouri, it creates, a degree of inefficiency and overhead. Thus, it is strongly suggested that regardless of the methodology implored within the manner to distribute state and local moneys to public school districts that careful and exhaustive study be given to examining the efficiencies of all school districts so as to develop best practices models on which to build the future of public education in the state of Missouri. Thus, when moneys are allocated to school districts the utilization of such public moneys can be efficiently utilized for the children of the state.

PART IV

AN OVERVIEW OF FEDERAL AND STATE EDUCATION FINANCE DISTRIBUTION CHALLENGES: FROM EQUITY TO ADEQUACY

As members of the state legislature are well aware there has been an intense struggle concerning fiscal resources involving public and elementary and secondary education across the nation for many years.[1] The state of Missouri is no exception and it must be observed that such struggles for greater fiscal resources are a natural occurrence within a capitalistic society. Such struggles are found within the political context of every legislative session in that it is assumed that at any given moment in time the state legislature represents the collective will of the people of a given state. However, this observation leaves much to be desired when juxtaposed with limited local and state resources, the present state of the national economy coupled with greater federal moneys being committed to the War on Terrorism. All of these issues exist within the inherent friction and conflict over scarce fiscal resources.

There are at least six concepts that render powerless any hesitancy concerning the importance of financial resources and public elementary and secondary education. The first concept is that public elementary and secondary schools indeed distribute economic and social opportunities in a nation fueled by competitiveness. The second concept is that these opportunities depend in large measure on the quality of the public elementary and secondary schools these children attend. The third concept is that despite a lack of strong productivity equations, school quality is heavily conditioned by fiscal resources that are purchased with money. The fourth concept is that absent ability to purchase these inputs, public elementary and secondary education must fail because altruism is not a sufficiently offsetting condition within our society. The fifth concept is that people who argue for the irrelevance of money still prefer a larger share. The sixth concept is that until money is irrefutably shown to make no difference, its effect must be presumed from the behavior of wealthy individuals who choose wealthy communities with high expenditure school districts for their children.[2] The study of education finance litigation is actually the study of the litigation of state aid distribution formulas and the results of those formulas in terms of the expenditure and revenue patterns to school districts.[3]

The challenges to education finance distribution formulas have centered on the state level since the Supreme Court's ruling in *San Antonio v. Priest*.[4] It has been specifically centered on the specific state constitution and the issues within each state regarding education as a fundamental right, the equal protection of the laws of the state, and the education articles of the individual state constitutions. Historically, education finance litigation has focused its efforts regarding issues of equality and opportunity as defined by each state's supreme court based on its

interpretations of the state constitution and the evidenced as introduced and evaluated by the various courts of a given state. Recently, more state cases have addressed the adequacy of education finance distribution formulas in terms of meeting state constitutional and statutory guidelines.

Federal Roots[5]

Legal struggles concerning the financing of public education are longstanding. Litigation has raised both federal and state questions based on particular strategies aimed at various features of federal and state laws as well as the applicable state constitutional clauses.

While no federal education finance lawsuits existed before the mid-Twentieth Century, the foundations were laid by American preoccupation with equality and supported by a series of broader issues with education finance overtones that would only later become apparent. The Fourteenth Amendment's equality provisions were spoken to in a number of ways.[6]

These strands were actually the expression and extension of judicial sympathy to a fairly liberal construction of the meaning of equality that had already resulted in establishment of certain fundamental rights under the law. In addition to the rights and liberties specifically guaranteed by the Federal Constitution, the U.S. Supreme Court had at various times enumerated several other rights which it found to be so fundamental that these rights could not be abridged or denied except by the most exacting due process of law.[7]

The Federal Response

Although federal litigation regarding racial equality spanned many decades,[8] it was in the 1954 *Brown v Board of Education*[9] decision where equality of educational opportunity under the law received its greatest impetus. In an often-quoted passage the Court proclaimed:

> ...[E]ducation is perhaps the most important function of state and local governments. Compulsory school attendance laws and the great expenditures for education demonstrate our recognition of the importance of education to our democratic society. It is required in the performance of our most basic public responsibilities, even service in the armed forces. It is the very foundation of good citizenship. Today it is a principal instrument in awakening the child to cultural values, in preparing him for later professional training, and in helping him to adjust normally to his environment. In these days, it is doubtful that any child may reasonably be expected to succeed in

> life if he is denied the opportunity of an education. Such an opportunity where the state has undertaken to provide it, is a right which must be made available to all on equal terms.[10]

Invoking the equal protection clause of the Fourteenth Amendment, *Brown* spoke strongly to the value of education, calling it one of the most important functions of government and noting its central role to preservation of a literate and free people. The Supreme Court in *Brown* declared that education was a right that must be made available on equal terms. Thus, *Brown* opened a new era of justice from which a whole field of civil and educational rights litigation would occupy the nation's court system for several decades.

It could be argued that if the Court's apparent mandate in *Brown* were to be fully satisfied, equal educational opportunity would have strong application to fiscal resources since uneven revenues are at the root of most other forms of inequality. Although it had not been a simple matter to force condemnation of racial inequality, at least there had been a long record of discrimination lawsuits against which concepts and theories could be empirically tested. In education finance inequality there was no rich history on which to rely. The question first became one of a conceptual nature, rather than a formal legal standard, from which litigants would be forced to argue. The only other alternative was to make analogy to the strands cited earlier, supported by the strong language of *Brown*. By the 1960s, plaintiffs had formulated arguments and were ready to file actions before the federal courts.

The unequal treatment under the law seemed well established in *Brown* because school children must be provided equal opportunity. It was reasonable to draw an equal protection analogy to geographic discrimination since it was widely known that educational opportunity varied greatly based on residence. The third strand also seemed applicable, as there was sufficient case law to argue that wealth may not serve to bar equality under the law. Of particular support to the latter theory was the belief that school district wealth could be the basis of wealth discrimination, i.e., leading to establishment of a new suspect class. In plaintiffs' minds, wealth suspectness was grounded in case law and it was simply a matter of transferring the *Brown* logic condemning racial inequality to fiscal inequality.

These conditions seemed ripe for a federal decision extending equality of educational opportunity to include fiscal equality. The first suit to be filed was *Burruss v Wilkerson*[11] that was brought in Virginia in 1968. The plaintiffs in *Burruss* based their claims on the Fourteenth Amendment, arguing that inequality in the school division's (district's) physical and instructional facilities resulted in a lack of equal protection of the law because the

quality varied among school divisions. A three-judge United States District Court stated that "[t]he existence of such deficiencies and differences is forcefully put by plaintiffs' counsel . . .we do not believe they are creatures of discrimination by the State . . . our reexamination of the Act confirms that the cities and counties receive State funds under a uniform and consistent plan . . . we can only see to it that the outlays on one group are not invidiously greater or less than that of another . . . no such arbitrariness is manifest here."[12] The court added that although "plaintiffs seek to obtain allocations of State funds among the cities and counties so that the pupil in each of them will enjoy the same educational opportunities . . . the courts have neither the knowledge, nor means, nor the power to tailor the public monies to fit the varying needs of these students throughout the state."[13]

A second federal case of *McInnis v Shapiro*[14] was decided in Illinois. Heard in United States District Court and affirmed by the U.S. Supreme Court,[15] *McInnis* was also a Fourteenth Amendment equal protection suit seeking to overturn the state education funding formula on the grounds that unequal educational expenditures based on variable property values as tax rates of local districts were arbitrary and an unreasonable denial of equal protection of the law. The court ruled for the defendant state. While the court acknowledged wide variations in expenditures per pupil based on wealth, the court stated its vulnerability before the question in three respects. First, variations in revenue were not on the face invidious and arbitrary. Second, the legislature's decision to allow local choice and experimentation was reasonable. Third, the court ruled that there was no Constitutional requirement establishing rigid guidelines for equal dollar expenditures under the Fourteenth Amendment's equal protection provisions. And fourth, the court was clear in stating that allocation of revenue was a policy decision better suited to legislatures.

In both instances federal courts had uniformly refused to intervene on three importantly consistent grounds. The first rationale was a plain reading of the Fourteenth Amendment, noting no equal protection mandate for unequal revenues. The second rationale was equally important, as the court deferred to the legislative branch by relying on the separation of powers doctrine in the absence of blatant invidious discrimination. The third rationale applied to the court's bewilderment as it noted its lack of judicially manageable standards, even if it were to rule for plaintiffs. Equality, then, to the federal court was a negative standard in that no affirmative duty was owed by the state to each child for resource equality; rather, the absence of something was not the same as invidious denial of that object.

The final federal issues were determined by the U.S. Supreme Court in *San Antonio Independent School District v Rodriguez.*[16] The case had actually been filed in 1968, and a three-judge panel had rendered a decision in 1971 holding the Texas system of school finance unconstitutional under the Fourteenth Amendment.[17] The case was then accepted on appeal by the United States Supreme Court. The plaintiffs argued key points taken from earlier successful but broader litigation. The plaintiffs contended that the Texas funding system violated the federal equal protection clause by discriminating against a class of poor and that students were denied their right to an education. Plaintiffs were actually arguing for wealth as a suspect class and for fundamentality at the highest level in an all-out effort to force strict judicial scrutiny.

The Supreme Court, however, refused to accept plaintiffs' arguments since it found no class of persons who were identifiably suspect. The plaintiffs argued that that the injured class should be comprised of all students living in poor school districts, rather than poor students themselves. Justice Powell, writing for the majority, noted that wealth discrimination in prior cases had historically been confined by the Court to personal wealth, and that the class in *Rodriguez* was not one for which special protection is usually provided, *i.e.*, it was neither politically powerless, discrete or an insular minority.[18] The Court further noted that individual income did not necessarily correlate with district wealth, and that even if the correlation were strong, the Court's historic application of wealth discrimination under strict scrutiny had been limited to absolute deprivation rather than relative differences.[19] Under these conditions, the Court found no distinct suspect class and held that since no student was absolutely deprived of an education, fiscal inequalities were of only relative difference and not entitled to wealth suspectness.

The Court in *Rodriquez* then turned to plaintiffs' claims for fundamentality, again refusing to accept their arguments. Plaintiffs had recognized the difficulty of this argument and had based their claims on the relationship of education to other extant fundamental rights in an effort to establish a clear nexus.[20] In this concept, public education was inextricably tied to other existing fundamental rights wherein the intelligent exercise of the right to vote and the right to free speech were said to depend on education. The Supreme Court refused these arguments, however, stating that it saw no more connection between public education and these rights than it could find between housing, food, or other subsistence and the right to vote.[21] The Supreme Court especially noted a difference between hindering a child from a public education and the state education finance distribution formula that, in its view, instead sought to improve available offerings.[22] Although the Supreme Court noted wide

disparities among Texas school districts, it rejected the standard of strict scrutiny, stating that a rational relationship was all that was required to defend a state distribution formula where no invidious discrimination could be found. In *Rodriquez*, a rational basis could be found in the state's goal of promoting local control of schools--a view supported by the Supreme Court's own words:

> Education, perhaps even more than welfare, presents a myriad of intractable economic, social, and even philosophical problems. The very complexity of the problems of financing and managing a statewide public school system suggests that there will be more than one constitutionally permissible method of solving them, and that, within the limits of rationality, the legislature's efforts to tackle the problems should be entitled to respect.[23]

The concept, as expressed in *Rodriquez,* was rejected by the U.S. Supreme Court. Contrary to *Brown*, there was apparently no fundamentality, no suspect class, and no equal protection for education except in cases of total educational deprivation or in the established instances of invidious discrimination such as race. It appeared from *Rodriguez* that little equality of educational opportunity could be gained apart from race, as the Supreme Court had sanctioned legislative prerogative and declared judicially unmanageable standards, while unwilling to go beyond the historically narrow application of race.

The Supreme Court ruling in *Rodriguez* had one primary effect concerning education finance litigation. The effect was to turn litigants' attention to the state courts.

The Post-*Rodriguez* Aftermath

Although *Rodriguez* dictated that legal challenges to education finance distribution formulas would have to originate in the states, there were three other federal cases coming after *Rodriguez*. In *Papasan v Allain*[24] plaintiff school districts in Mississippi argued violation of federal equal protection in revenue differences based on Section 16 land income lost during the War Between the States. Although the state of Mississippi had provided aid to help offset those losses, by 1981 state funds were only $.63 per pupil compared to $75.34 per pupil in districts whose lands had not been lost. Originally dismissed in federal district court, the Fifth Circuit Court of Appeals held that equal protection would not be barred by the Eleventh Amendment,[25] but also held that *Rodriguez* was the controlling standard on disparate funding. The U.S. Supreme Court upheld the immunity decision,[26] but reversed on the equal protection issue and remanded the case for development because the countenance of discrimination absent a legitimate state interest was sufficient to state a cause of action. *Papasan* is thus important for what it stated and for what it failed to state. The complaint did not raise the issue of fundamentality, so that the federal court dealt only with a narrow legal question. In addition, a glimmer of federal interest in education finance was seen on remand as the court noted that unreasonable government action would be scrutinized.[27]

The second important federal case after *Rodriguez* was also from Texas as the Supreme Court ruled in *Plyler v Doe*[28] that the refusal by a state to educate undocumented school-aged children involved an area of special sensitivity that would merit constitutional pleas of equal protection. While the Court in *Plyler* stopped short of declaring education a fundamental right, it stated a higher level of scrutiny and interest in cases of educational deprivation, utilizing language that seemed less closed to fundamentality under such conditions. The *Plyler* majority stated that while its ruling in *Rodriguez* remained intact, it was deeply concerned that education was more than a mere service and convenience to citizens. The Supreme Court stated:

> Education provides the basic tools by which individuals might lead economically productive lives to the benefit of us all. In sum, education has a fundamental role in maintaining the fabric of our society. We cannot ignore the significant social costs borne by our Nation when select groups are denied the means to absorb the values and skills on which our social order rests.[29]

The third and final important federal case occurred in 1988 in *Kadrmas v Dickinson Public Schools*.[30] In *Kadrmas*, plaintiffs had argued that charging for school bus service was, in fact, denial of equal protection since the

plaintiff child was wealth-disadvantaged. Although the Court found for the defendant state, its five to four vote was sharply divided and indicative of the constantly unsettled nature of a federal claim involving education, and further noted in strong language that there are variances and exceptions that preclude absolutism in interpreting *Rodriguez*. *Kadrmas* stands as the most recent proof of this indeterminateness, as the dissenting opinion sharply stated:

> The Court therefore does not address the question whether a state constitutionally could deny a child access to a minimally adequate education. In prior cases this court explicitly has left open the question whether such a deprivation of access would violate a fundamental constitutional right. That question remains open today.[31]

From these challenges, several observations may be stated. First, it can be gathered that the Supreme Court is sympathetic to the problems of judicially manageable standards. Second, the Supreme Court is quick to uphold legislative prerogative. Third, the Supreme Court is reluctant to declare education a fundamental right, and any reversal is not likely to occur lightly. Fourth, the Supreme Court is not yet willing to create new suspect classifications. Fifth, in the case of education the Supreme Court has narrowly interpreted equal protection to mean racial equality or, alternatively, to mean absolute deprivation which has fiscal overtones. Sixth, *Rodriguez* has been the controlling precedent in subsequent litigation, and the Supreme Court itself has utilized *Rodriguez* to reject further assaults on a federal educational right. But seventh, all assaults following *Rodriguez* have been narrowly drawn, and it is clear the Supreme Court holds an undefined interest in education that may eventually emerge. Future federal cases will depend on changes in the Supreme Court's make-up. But it is finally clear that no firm federal case yet exists--a reality that has in fact effectively turned most traditionally pure education finance litigation to the state courts for adjudication.

State Court Tests

Legal struggles concerning the financing of public schools have occurred for more than 100 years. The perception of recency concerning education finance litigation is particularly misguided. Federal claims beginning in 1968 lend the appearance that education finance litigation is only a modern phenomenon. The intensive state-level reform following the failed federal test in *Rodriguez* has confirmed the impression of recency. But while a lengthy history of education finance litigation could be drawn,[32] it is more instructive in the modern context to examine the state court test in the post-*Rodriguez* light because these events have had the greatest impact in shaping current

education finance constitutional challenges. As noted in this report these claims have moved from equity to adequacy during the last several years.

The State Response

There has been considerable overlap in the chronology of federal and state lawsuits, as well as the issues framing the various challenges to unequal fiscal resources. Chronological overlap occurred as lawsuits were brought in both federal and state courts in the early days of reform. *Burruss*, *McInnis,* and *Rodriguez* were brought in federal court under Fourteenth Amendment claims in the 1960s, but *Serrano* had previously been decided at the California State Supreme Court level before the United States Supreme Court finally reached its ruling in *Rodriguez* in 1973. Overlap of issues occurred in like form, as the federal cases obviously addressed federal equal protection and as state cases such as *Serrano* also commonly brought both federal and state constitutional claims. There are no lines of demarcation as might be implied from the earlier federal discussion; however, state litigation has become the standard fare in the post-*Rodriguez* era.

The state test is usually marked with the historic ruling of the California Supreme Court in *Serrano v Priest.*[33] Destined to become the classic model for state education finance equity litigation, the plaintiffs charged that the state financial aid distribution formula for distributing financial aid to public school districts violated the federal and state constitution's guarantees of equal protection. Inherent to these allegations were concepts of fundamentality, wealth suspectness, and equal protection under the state constitution to which reformers had earlier pinned their hopes in the failed federal test. The complaint thus set three causes of action. First, the plaintiffs alleged that as a direct result of the state distribution formula for schools, substantial disparities existed in the quality and extent of educational opportunities. Second, plaintiffs alleged that as a result of such an education finance distribution formula, they were likewise required to pay higher tax rates in order to obtain the same or lesser educational opportunity. And third, plaintiffs alleged that these realities worked jointly to deny children the equal protection of the laws, to deny them their fundamental right to education, and to make the quality of education a function of residence wherein quality varied in response to local district wealth. Given these causes, the plaintiffs in *Serrano* sought to invalidate the state aid distribution formula under the federal and state constitutions.

The California Supreme Court found for plaintiffs on every cause. The California Supreme Court provided numerous condemning statements concerning unequal educational opportunity. In establishing the facts, the state supreme court first noted that the root of disparity was unmistakable in that aid was insufficient to offset the widely disparate assessed valuation per pupil in Baldwin Park of $3,706, compared to Beverly Hills' valuation of $50,885 per pupil, a ratio of 1:13. Second, the state supreme court noted that state aid actually widened the gap between rich and poor school districts, as aid was distributed irrespective of wealth wherein rich and poor districts alike were aided by the state. Third, the court noted that such aid was effectively meaningless to poor districts. In ruling regarding wealth suspectness, the state supreme court rejected the state's traditional claim that suspectness lay only with individual wealth, stating that

> [t]o allot more educational dollars to the children of one district than to those of another merely because of the fortuitous presence of property is to make the quality of a child's education dependent upon the location of private commercial and industrial establishments--surely this is to rely on the most irrelevant of factors as the basis for educational financing.[34]

The court went on to state "we reject defendants' underlying thesis that classification by wealth is constitutional so long as the wealth is that of the district, not the individual. We think that discrimination on the basis of district wealth is equally valid."[35]

Similarly, in ruling for fundamentality the California supreme court turned to both law and logic to justify its position. The court stated that education in a modern industrial state was indispensable, and noted that education had two major distinguishing attributes that qualified it as a fundamental right. First, the court stated that education was a major determinant of an individual's chances for economic and social success in a competitive society. Second, the court noted that education was a unique influence on the development of citizens and their place in political and community life. The court then turned to its own thinking and the California state constitution in declaring fundamentality. In comparing education to other fundamental rights, the supreme court justices stated "[w]e think that from a larger perspective, education may have far greater social significance than a free transcript or a court-appointed lawyer."[36] The court then considered the education article of the California state constitution,[37] declaring fundamentality on five bases. First, education was essential to free enterprise democracy. Second, education was universally relevant. Third, unlike other government services, public education continued for a lengthy period of time. Fourth, education was unmatched in molding youth and society. And fifth, education was

so important that the state had made it compulsory.[38] The state supreme court then ruled that plaintiffs were entitled to strict scrutiny equal protection, and that the federal and state equal protection clauses were both impermissibly violated.

Although *Rodriguez* would later invalidate the federal claims in *Serrano*, the case was powerful and decisive for education finance reform across the nation. First, *Serrano* proved that the meaning of equal educational opportunity could be so broadly sweeping as to include education finance. Second, *Serrano* proved that states could be vulnerable to constitutional attack, even though the federal courts had been unassailable. Third, under state provisions *Serrano* successfully established all three claims of fundamentality, wealth suspectness, and equal protection. Fourth, *Serrano* had an immediate and profound effect, sparking dramatic reform of state aid distribution formulas in many states. Finally, *Serrano* compelled the flurry of reform both through legal standards and by the court's view on how inequity might be redressed. *Serrano* proposed several alternatives, including full state funding and statewide taxation.

The impact of *Serrano* was accelerated by the New Jersey superior court decision in 1972 in *Robinson v Cahill*.[39] Plaintiffs had alleged that the state education finance distribution formula violated federal and state equal protection laws and the fundamental right to an education, in that tax revenues varied greatly by school district wealth and were inadequately unequalized by the state of New Jersey. According to plaintiffs, there existed a state denial of equal educational opportunity and equal protection by making the quality of education dependent on the wealth of each local school district. The plaintiffs argued that the state of New Jersey had abrogated its responsibility to public elementary and secondary education because the state statutes were not equal in effect on all citizens where equal tax effort did not produce equal tax yield, despite the fact that state aid provided approximately 28 percent of all school district revenues. The trial court agreed in principle, and the case was taken on appeal by the state supreme court.

The 1973 New Jersey Supreme Court ruling, which came after *Rodriguez*, was notable for many important reasons. First, the New Jersey Supreme Court refused to rule for fundamentality, perceptively noting a profound hesitancy in *Rodriguez* that had been overlooked by plaintiffs. The United States Supreme Court had said that

> [e]very claim arising under the Equal Protection Clause has implications for the relationship between national and state power under our federal system...[i]t would be difficult to imagine a case having a greater potential impact on our federal system than the one now before us, in which

> we are urged to abrogate systems of financing public education presently in existence in virtually every State.[40]

Second, the New Jersey Supreme Court noted that the United States Supreme Court had never cited *Brown* as a case involving the fundamental right concept, stating that *Brown* would point the opposite direction since it declared education to be a most important function of state and local governments.[41] Third, the New Jersey Supreme Court refused to find wealth a suspect class, noting that "if this is held to constitute classification according to 'wealth' and therefore suspect our political structure will be fundamentally changed."[42] Under these conditions, the court could find no basis for fundamentality or federal equal protection. But critical to reform, the New Jersey Supreme Court nonetheless ruled the state system unconstitutional by invoking the education article of the state constitution that demanded a "thorough and efficient" system of education. A requirement that was not met due to a lack of equalization in revenues and thus violating the state's equal protection clause.

Robinson was equal or greater in significance than either *Serrano* or *Rodriguez*. As the first test to follow the federal debacle in *Rodriguez*, *Robinson* was proof that plaintiffs could potentially prevail at the state level. While a ruling for fundamentality and suspectness would have strengthened reform, critics were overlooking an enormous lever in that *Robinson* showed that education finance litigation did not necessarily have to turn on fundamentality. *Robinson* found no need to rely on tenuous *Brown* analogies. The genuine effect of *Robinson* was not in its failure to establish coveted claims, but rather in prevailing solely on the education article of the state constitution. *Robinson* thereby opened the possibility to technical examination of state aid distribution formulas wherein analysis could be centered on whether the state financial aid distribution formula worked sufficiently well so as to not deny equal protection of state laws. In sum, *Robinson* greatly aided reform by helping to move from high-risk litigation strategies that depended too heavily on ephemeral constitutional analysis.

The ruling of the *Robinson* court revealed the third approach of an emerging school finance litigation strategy.[43] Although the federal case had failed, *Serrano* and *Robinson* taken together indicated that plaintiffs could still bring claims for equal protection and fundamentality wherein an adverse federal ruling on the latter would not negatively affect equal protection claims under interpretation of the education clause of the individual state constitutions. Since the Tenth Amendment had cast educational responsibility to the states, this strategy would apply universally since all states had included some statement in the respective constitutions concerning education. The fundamentality claim, while not equally universal, should also be uniformly made since it might succeed in

some states. The strategy thus shifted to multiple prongs with sub-parts. The first prong of any challenge to a state aid distribution formula would direct the assault toward state courts. The second prong would seek relief under both federal and state provisions for equal protection. The third prong would seek a ruling for fundamentality in hopes of securing strict scrutiny. The fourth prong would challenge the education finance distribution formula under analysis of the education article, wherein chances for success could depend upon court analysis of the state constitutional framers' intent, the inclinations of each state court, persuasive litigation from other states, and the strength of language of the state education article itself. In this manner, a rational basis test might also be sufficient to win.

The decisions and strategy derived from *Rodriguez, Serrano,* and *Robinson* have provided a legacy of intense litigation in most of the states. Since 1971, state aid plans have been held unconstitutional at the state supreme court level in a number of states.[44] These states have spurred the hopes of reformers, as each instance has provided another opportunity for determining the elements of successful state constitutional analysis. The universality of winning strategy has not been perfect, however, as state courts have reached different conclusions when confronted with the unique provisions of each state's statutes. It has been suggested that to win the plaintiffs, or the state, must have an overall strategy of an outstanding legal team, an outstanding team of education finance experts along with a thorough understanding of the education finance research.[45]

While litigation has succeeded in many states, education finance distribution formulas have also been upheld in other states. State education finance distribution formulas have been challenged, at various times and with various results,[46]

Several states have ruled that portions of the state education finance distribution formula were unconstitutional, e.g., in Idaho regarding the distribution of capital outlay financial assistance,[47] and the methodology of funding classes for English language learners in Arizona.[48] Several state supreme courts have issued rulings wherein the state supreme court has overruled a previous state supreme court decision, which has had the effect of changing the state education finance distribution formula. These include Arizona,[49] North Carolina,[50] South Carolina,[51] Ohio,[52] and Texas.[53]

From this overall litigation, significant features have emerged. First, the supreme courts in a number of states have declared that education is a fundamental right based on the state constitution. Second, based on the state constitution, there are many states in which the highest court has declared that education is not a fundamental right. Third, there has been no perfect pattern whereby establishing fundamentality has automatically invalidated a state

finance distribution formula by virtue of invoking coveted strict scrutiny. For example, the Arizona supreme court found that education was a fundamental right, but nonetheless ruled for the state in *Shofstall v Hollins* in 1973. Similarly, the Wisconsin court declared in *Buse v Smith*[54] that education was a fundamental right, but later noted in *Kukor* that a rational basis was all that was required to uphold the state aid distribution formula when absolute denial of education is not at question. Fourth, the harshness of this reality has been somewhat softened by the logic of *Robinson*, as several state supreme courts have ruled for plaintiffs by finding equality a requirement, even absent the one feature of fundamentality that would invoke strict scrutiny analysis. Only one state other than California has declared wealth a suspect class, as the Wyoming supreme court in *Washakie*[55] invalidated its education finance distribution formula, establishing that no equality could exist until funding was also equal.

Recent Adequacy Lawsuits

In recent years an additional movement has emerged in challenging the state finance distribution formulas. That is, the plaintiffs argue that the state aid distribution formula is fiscally inadequate. Thus, it is argued, the state aid distributional formula fails the state constitutional mandate and the applicable statutory mandates for an education that meets minimal standards. A few of these suits have emerged after the applicable state supreme court has ruled that equity was either already met, or only the legislature could define such a concept. In a few instances, these suits essentially question the concept of "the equality of poverty." That is to say, if a state aid distribution formula allocates funds in an equitable manner, but such funds were, by definition, unable to meet various educational and academic standards such a distribution formula would be by definition inadequate. The question then becomes whether the distribution formula then violates the applicable constitutional and statutory obligations of the state.

Various legislatures have unwittingly established a standard by which many plaintiff groups are able to question and quantitatively establish noncompliance via the state distribution formula. That is to say, in the movement toward greater educational accountability and raising academic standards for the public schools of a given state, the legislature has, unsuspectingly, defined by statute what an adequate education consists of. Thus, when school districts are not able to meet those stated standards, due to fiscal constraints as placed upon them by various statutes and economic realities, the plaintiffs argue for relief. The relief sought is to declare the state aid distributional formula unconstitutional.

In recent years, state legislatures have faced an increasing number of challenges to the state financial distribution formula based on the concept of adequacy. Generally, the plaintiffs are not challenging the equity of the distribution formula. The plaintiffs are challenging the fact that the education finance distribution formula either does not allow for adjustments for certain classification of students, e.g., at -risk students, or the plaintiffs utilize the fact that certain groups of children are not achieving certain levels on state imposed standardized tests. The plaintiffs argue that by virtue of the fact that certain groups of children are underachieving on these state imposed sanctions that the distribution formula is, by definition, inadequate, at least for these groups of children.

Also, increasingly, several states have attempted to determine the adequacy of public education. In September 2003, North Dakota released its cost study that estimated that a 31 percent increase was necessary to adequately fund public elementary and secondary education.[56] In 1998, the South Carolina School Boards Association commissioned an adequacy study. The study determined that funding would have to increase by 50 percent in 1998 dollars to meet the state imposed standards by 2010. [57] At the time of this writing, several states are exploring the measurement of adequacy including California which has established the California Quality Education Commission and is charged with the responsibility of determining the educational components, fiscal resources, and corresponding costs necessary so that students can meet academic performance standards.[58] The state of Oregon established the Quality Education Commission that published the Quality Education Model that utilized three broad based panels to determine the costs of an adequate education in the state of Oregon. [59]

Often, these "costing-out" studies are seriously flawed from a methodological framework. Many such studies exhibit serious research methodological flaws. Quite often, it is the plaintiffs who commission such studies and then purport them to be valid and scientific so as to prove their point of view. Interestingly, many courts have accepted these studies without question, as the states have often not presented any valid arguments. Notwithstanding these issues, these studies tend to condemn all education finance distribution formulas regardless of the nature of the formula. Determining the adequacy of public elementary and secondary education is, at best, a difficult task. In attempting to determine adequacy there are two basic models currently in practice. These models attempt to estimate a base cost figure by which to establish state aid. These two models consist of what is referred to as the Successful School/District Model and the Professional Judgment Model. Each has virtues and vices. Presently, the state of education finance reveals that the determination of adequacy tends to center around the Successful Schools/Districts Model and/or the Professional Judgment Model. It is important to note that in the

successful Schools/Districts Model, the approach attempts to determine the foundational level, which would then become the model by which school districts are funded.

In the Successful Schools/District Model, one can articulate that subjectivity is limited by simply determining the successful schools/districts based on achievement in relationship to expenditures. Success can be defined in a number of ways as determined by the state. Generally, a number of school districts are selected to represent a cross section so as to reflect wealthy, as well as poor districts. That might be successful with various school children.

The Professional Judgment model calls for a panel of practicing educators, as well as state and local policymakers, to determine what makes for an adequate education. Once this adequate education is determined then the task is to determine the actual costs of such a program. It is important to note within this model that the task is to determine an adequate education, not an excellent education.

Additionally, there are variations of the two models. Some additional models include examining the costs of successful schools regardless of whether they are in the public or private sector. Thus, this model would utilize these data for the basis of developing a foundational level. It is also possible to utilize statistical analysis that would account for numerous variables to determine the foundational level. [60]

Perhaps the most recent adequacy case is the trial court decision in *Montoy v. Kansas*[61] in 2003. The trial court ruled on behalf of the plaintiffs in viewing that the state financial aid formula did not fund the standards to which the school districts were held accountable. In a lengthy opinion, the trial court noted, "[I]f challenged, the legislature must be prepared to justify spending differentials based on actual costs incurred n furnishing all Kansas school children an equal educational opportunity. In other words, all children similarly situated must be treated alike."[62] The trial court went on to state:

> However, in order to fulfill its duty to provide each child with equal educational opportunities, the Legislature must begin by providing each district with the same amount of funding per pupil. The Legislature may then increase funding for a particular school district only if there are rational reasons that are based on actual increased costs necessary to provide children, or particular children, in that district within an equal educational opportunity.[63]

In summation, the trial court stated:

> . . . a constitutionally suitable education (much like an efficient education or an adequate education as provided for in the constitution of our sister states) must provide all Kansas students, commensurate with their natural abilities, the [knowledge and] skills necessary to understand and successfully participate in the world around them both as children and later as adults.[64]

Two major fundamental issues have emerged in recent years that are beginning to exert major influence in the arena of education finance litigation. The first concept is that states have begun to develop values and goals for public schools in terms of student achievement and standards. Unwittingly, these have lead to a quantitative standard of the success or failure of school districts. As discussed previously, this has led to the argument that, by definition, these schools have failed and thus are deemed to be inadequate. A second, and larger, thrust has emerged as perhaps an unintended consequence as a result of the Federal No Child Left Behind Act (NCLB) passed by Congress in December 2001.[65] This federal law based on the concept of standards based reform requires each state to develop its own standards and to identify those schools that fail those standards and to further identify those schools that do not make Adequate Yearly Progress (AYP) toward meeting those standards. Thus, in virtually every state, the plaintiffs will be able to fully access, examine, and to analyze each school district's data, school by school, in order to determine which schools are not making AYP. Then, by extension, the state has demonstrated, on its own terms, and via federal statute, which schools are failing to meet AYP and, by definition, regardless of the state aid distribution formula are deemed to be "inadequate" by such a definition. In fact, one could suggest that this strategy will be piloted in a handful of states, and if successful, will lead to the next major wave of public education finance distribution challenges.

Specifically, the NCLB calls for the identification of schools that are in "need of improvement," or are "subject to corrective action." These standards of identification also call for schools to be identified that are "unsafe." The standards call for all schools to have 100 percent of students achieve proficiency on state standardized test by the year 2014. The number of schools making such lists is predicted to be significant in many states. Under NCLB each state sets its on standards, while this is certainly subject to criticism from a variety of sources, it is interesting to note that it will, in the long run, assist the plaintiffs in the education finance distribution challenges in that since the state set the standard, issues of reliability an validity are not germane to the state's defense.

Increasingly, more states are attempting to determine the true costs of providing an adequate public elementary and secondary education. In some instances, this is the result of a suit in which the court directs the

legislature to determine such an attempt. In this manner, funding formula distribution patterns and amounts can be obtained for the state. Specifically, this was the result of a long history of litigation concerning the funding distribution patterns in the state of Arkansas.[66] The Arkansas Supreme Court directed the state to conduct an adequacy study. The court placed a January 2004 deadline for the legislature to remedy the state aid distribution formula that it found to violate the state constitution. As a result, in September 2003, the Arkansas Joint Committee on Educational adequacy released a report entitled, *An Evidence-Based Approach to school Finance Adequacy in Arkansas.*[67] This report determined that the overall spending for public elementary and secondary education would have to increase by 33 percent to become adequate and to achieve the state's standards.

The state of Ohio has presented a long and convoluted issue of judging adequacy of the education finance distribution formula.[68] In 1997, the state supreme court in *DeRolph v. State*[69] ruled that the state education finance distribution formula was unconstitutional and remanded to the common pleas court. The state supreme court directed the legislature to change the distributional formula. Despite efforts by the governor and the legislature to fund public elementary and secondary education, the plaintiffs again brought suit as to compliance and the order was clarified.[70] The state appealed and the supreme court allowed additional time for compliance.[71] The state supreme court again ruled that the funding system was still unconstitutional[72] After this decision, the legislature, again, increased funding for public education in the amount of $ 1.4 billion. In September 2001, the court issued *DeRolph* III[73] directing remedy measures for the legislature. In December of 2001, the court appointed a mediator to work between the parties. In March of 2002, the mediator stated that he had failed to produce an agreement between the parties.

The court vacated DeRolph III and held that DeRolph I and II were the law of the state and stated that school funding was unconstitutional.[74] In March of 2003, the state filed a writ of prohibition seeking that the court of common pleas from exercising any further jurisdiction. On May 16, 2003, the Ohio State Supreme Court issued its opinion in *State v. Lewis*[75] in which it ended further litigation by declaring the education finance distribution formula was unconstitutional and directed the legislature to remedy the situation. The court did not retain jurisdiction in this case.

In August of 2003, the plaintiffs filed a Petition for *Writ of Certiorari* before the U.S. Supreme Court contending that the state supreme court violated the U.S. Constitution's due process clause because it prevented the enforcement of a court ordered remedy and denied the plaintiffs equal protection because Ohio school children were

treated differently than other successful litigants before the Ohio courts. In October of 2003 the Court denied *certiorari.* [76]

Several states have current adequacy suits in various stages. North Carolina is a prime example of a state still within the restrictions of an adequacy suit. In *Leandro v. State*, beginning in 1995,[77] the courts linked the failures of the plaintiff school districts to the state learning standards. In a series of opinions, the courts have ruled that the state must fund at-risk students. Hearings have been held over several years. The court issued a number of interpretive orders declaring that the failure of at-risk students was a function in insufficient state funding and lack of implementation of successful programs.[78]

In *Campbell County* in Wyoming, the state supreme court ruled the state distributional formula unconstitutional.[79] In doing so, the court ordered a detailed cost analysis. The legislature had passed and identified the core knowledge and skills of students so as to constitute a "proper" education. On February 23, 2001, the Wyoming Supreme court in *Campbell* upheld the new cost based distributional formula and stated that it was capable of fulfilling the constitutional guarantees.[80] The court did note that a variety of factors should be analyzed every five years and adjustments due to inflation at least every other year.

The Massachusetts Supreme Court overturned the education finance distribution formula in 1993.[81] A trial in Superior Court began June 12, 2003 and will have a potential major impact on the future of all public schools in the state of Massachusetts. In *Hancock v. Driscoll* with roots tracing back to the original *McDuffy v. Secretary of Education*. . . "begins its likely 60- to 90-day run . . . when children from 19 plaintiff school districts argue that, even 10 years after the Court declared the state's duty, the Commonwealth is still failing to provide children with the constitutionally-required education."[82]

The state of New York has presented a lengthy and far reaching adequacy issue. In *Campaign for Fiscal Equity v. State* the New York Supreme Court ruled that the New York City schools were inadequately funded and therefore the state distributional formula was held to be unconstitutional. On appeal, the appellate court ruled on behalf of the state in requiring that the state's obligation was only for certain grade level proficiencies. The New York highest court, the State Court of Appeals on June 26, 2003 issued its ruling in *Campaign for Fiscal Equity v. State*[83] in which it upheld the trial court stating that the public schools of New York City were inadequately funded and thus unconstitutional and directed the state to determine the cost of a "basic meaningful education" within the public schools of New York City. The majority opinion stated under its final remedy summary the following:

> The majority first directs the State to determine the actual cost of a "sound basic education" and to ensure that every school in New York City has the necessary funding to meet the standard, and sets a deadline. The funding level must reflect the cost of a "sound basic education" that is not tied to anything other than a "meaningful high school education." The majority also remands the case to the trial court to review the Legislature's efforts to determine if under the new funding scheme "inputs and outputs improve to a constitutionally acceptable level."
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> . . .
>
> This remedy is extraordinary, if not unprecedented. Having determined that the State is not satisfying its constitutional obligations with respect to the education of New York City's public school children, we should--as the State requests--simply specify the constitutional deficiencies. It is up to the Legislature, as the entity charged with primary responsibility under the Education Article for maintaining the State's system of public education, and the Executive, who shares responsibility with the Legislature, to implement a remedy. This lawsuit should be at an end. Instead, the majority, observing that "the political process allocates to City schools a share of State aid that does not bear a perceptible relation to the needs of City students," . . . casts the courts in the role of judicial overseer of the Legislature. This disregards the prudential bounds of the judicial function, if not the separation of powers.
> Moreover, as soon as the trial court is called upon to evaluate the cost and educational effectiveness of whatever new programs are devised and funded to meet the needs of New York City's school children, the education policy debate will begin anew in another long trial followed by lengthy appeals. The success of the new funding mechanism will then be tested by outputs (proficiency levels). This dispute, like its counterparts elsewhere, is destined to last for decades, and, as previously noted, is virtually guaranteed to spawn similar lawsuits throughout the State.[84]

The overview of this arena indicates an uncertain patchwork of decisions. Yet, despite the uneven record, there are indicators of which claims have consistently received the most court sympathy or rejection. First, it is extraordinarily rare to reach wealth as a suspect class. As stated very early in *Robinson,* the unintended implications for society are too broad in that all other government services could be immediately subject to the same claim. Second, fundamentality is only slightly less rare, as courts are slow to construe new rights from state constitutions and for which federal precedent is adverse. Third, federal equal protection is *derigueur* in claim, but state equal protection is a key to overturning state aid distribution formulas. This is a strategy that does not usually work well unless the education article can also be invoked in a plain reading that requires the state to accomplish what it set out to do. For example, the Supreme Court of Texas in *Edgewood* in 1989 stated "[w]hether the legislature acts directly or enlists local government to help meet its obligation, the end product must still be what the constitution demands."[85] Taken collectively, this suggests that favorable rulings depend at least in part on specific language in state constitutions. Again, as Wood has stated, the successful party must have an outstanding legal team, an outstanding education finance research team, and a well-grounded knowledge of education finance research.[86] While the relationship may not be perfectly incremental as language increases, in most instances the opportunity for success does diminish rapidly as language becomes more vague.

Principles and New Directions in Litigation

First, it may be safely stated that litigation will not achieve great success in federal courts. The only exceptions to this principle rest in events that might cause the Supreme Court to abandon its traditional position on fundamentality, wealth suspectness, or broadened interpretation of Fourteenth Amendment equal protection. Given the present composition of the Supreme Court this seems highly unlikely as well as the Supreme Court's historic reluctance to create new fundamental rights, that path will disappoint reformers unless a nexus to other fundamental rights can be better established. Despite *Plyler*, the Supreme Court has stood firm in determining that education is a most important responsibility of state and local governments. Similarly, wealth as a suspect class is an unfruitful attack unless the Supreme Court unexpectedly reverses itself or unless plaintiffs can show overwhelming and consistent wealth-education discrimination against individuals. Likewise, federal equal protection will remain largely unavailable except when established suspect classes can be linked to education finance. The only other alternative is by changes in the Supreme Court itself. Under these conditions, a federal plea will receive sympathy only by dramatic breakthroughs or by new political appointments.[87]

Second, it may be confidently stated that litigation will continue in state courts into the foreseeable future. Although the record in state courts has been mixed, plaintiffs have achieved their only successes at this level. Within state courts, it is equally evident that the plea for fundamentality will experience very limited success, as these courts will frequently apply the federal test in the absence of strong state constitutional provisions. It must, of course, be noted that few state constitutions have the language needed to unquestioningly require strict scrutiny. Even when such language is present, it should still be recognized that many courts will hesitate at fundamentality because of the powerful analysis found long ago in *Robinson* in which the court perceptively recognized that society itself could be unintentionally transformed by hasty declarations of fundamentality because even a noble goal could be twisted under law by turning other mere social conveniences into fundamental rights. As such, litigation in state courts will continue to turn on issues other than fundamentality or wealth suspectness.

Third, it is likely that *Serrano* logic will have only limited utility in that courts have generally moved beyond striking down education finance distribution formulas that are unequal without evidence that inequality results in an inadequate education. While this may appear regressive, there is an attractive logic that underlies it. The court in *Serrano* presumably did not care that the system could be adequate without being equal--in contrast, the predominance of subsequent decisions have attempted to determine if inequality were in fact followed by

inadequacy. While the standard appears to be lowered, it may be ultimately beneficial in that the linkages between resources and equal opportunity will be resultantly strengthened because plaintiffs will be required to demonstrate these effects. In the past this has been a difficult hurdle for the plaintiffs. As discussed herein, the No Child Left Behind Act and the various state standards make such hurdles achievable in a relatively gentle fashion.

Fourth, the potential demise of *Serrano* logic also speaks to dubious survival of strategies based only in noble theories and moral outrage. The failure of this strategy is evident in the shambles of federal hopes after *Brown*, leading to the conclusion that there is high regard for conscience in the context of the law, but lawsuits are generally won by constitutional obligations. Instances of "soft" litigation are rare, and the outrage in *Pauley* is generally nonreplicable at the state level as well, as is its level of judicial prescription.[88] Likewise, Wyoming's requirement of equal expenditures is not generally likely to recur elsewhere. This view is especially reinforced in compliance litigation, as even in *Serrano II*[89] the court was satisfied when most fiscal variations were erased. This logic was also echoed in *Horton II*,[90] as the court under constitutional fundamentality required only that disparities not be so great as to be unconstitutional. This was also the overwhelming view of the Virginia Supreme Court in *Scott v. Commonwealth* in which the court stated that disparities were acceptable as long as all school districts were minimally adequate as defined by the state constitution.[91]

Fifth, it is likely that the *Robinson* strategy of scrutinizing the education clause of individual state constitutions will continue to be the most promising strategy. This certainly applies in the latest adequacy suits. It is also consistent with the foregoing in that the greatest scrutiny will likely rest in how closely the state achieves its adequacy aims when measured against its constitutional requirements and state imposed academic accountability requirements. *Robinson* demonstrated that fundamentality and suspectness are not absolute prerequisites to success, and most subsequent winning litigation stands as further proof to this truth. The ephemeral and intangible nature of fundamental rights and wealth suspectness is frustrating to courts, which in contrast can usually make plain reading of state education articles and apply the more tangible concept of equal protection and adequacy. Given that courts have no dispositive proof to presuming the linkage between wealth and opportunity, tying specific language to factual analysis in the context of equal protection likely explains the success of the *Robinson* strategy.

Sixth, it is likely that different decisions will continue to be handed down by state courts using the *Robinson* strategy for several reasons. One reason is obviously that different constitutions state significantly different things. A second reason is that courts themselves cannot examine language so dispassionately as to read

nothing into the language except the words, i.e., words are subject to perceptual political/social filter.[92] Still a third reason is that the language in many state education articles is nearly empty. In these cases, courts are exhibiting an interest in constitutional debate analysis wherein the court examines the framing of the constitution to determine the intent in the education article. Although it has been suggested that many legislatures had no motive deeper than copying other states' education articles, the more recent decisions in Kentucky and Texas seriously examined the framers' intent in order to determine the meaning of 'thorough and/or efficient' phrases. An increasingly common strategy combines the framers' intent, litigation from similar states, measures of adequacy, or lack thereof, as well as jurisdictional precedent to cast a 'plain' reading of the education article. Thus decisions will be different among the states, with some influence by other reform aided or deterred by the inclinations of the court itself.

Seventh, it is likely that courts will always be reluctant to engage in specific judicial prescription as a remedy to education finance distribution problems because courts are bound to respect the separation of powers. For decades, courts have hesitated to intervene in legislative affairs, nothing that they have neither the power nor the expertise to prescribe solutions to political questions. Courts generally, rule only on questions of law brought before them and direct the issues to the legislatures for remedy. As such, in one sense courts are poor tools to force reform, as they will almost always stop short of providing actual remedy.[93] In addition, the courts can actually frustrate reform since a favorable decision for plaintiffs by no means guarantees immediate or receptive legislative response; for example, the response to *Edgewood* in Texas was a call for a constitutional amendment that would nullify the court's decision. Ohio, as discussed herein, appears to be no closer to an acceptable remedy that will satisfy the plaintiffs than it was before *DeRolph*. Alternatively, however, much progress has been wrought by litigation. As a consequence, a natural tension will continue to slow reform, as courts will not readily pursue direct intervention strategies.[94]

Eighth, it is likely that reform will be slow and will remain incomplete for many years. In one sense, the legal and policy issue was identified so many years ago in *Sawyer* in 1912 when the court stated, "[t]he method of distributing the proceeds of a tax rests in the wise discretion and sound judgment of the Legislature. If this discretion is unwisely exercised, the remedy is with the people, and not with the constitution,"[95] a view consistently upheld and confirmed by *Rodriguez*. Thus, it should be noted that legislatures may engage in policies that are perhaps unwise as long as these policies are not unconstitutional. Under these conditions, it would seem that reform has gained little ground in this regard. Yet, on the other hand, it is encouraging to note that standards do change

with the times, as contemporary views regarding inequality have led to significant judicial intervention by state courts. Indeed, *Sawyer* may have been right for the wrong reasons, i.e., justice makes few errors of haste, and rapid change is often available only at the voting polls. Thus litigants expecting dramatic events may be disappointed. But it still should be stated that deliberateness can be beneficial, as dizzying change may not be wise public policy.

The net sum of over a quarter century of intense education finance litigation finally proves that the outcome of future lawsuits cannot be known. Too many variables impact on an ever-changing social milieu, and the courts themselves are never certain of whether to lead or to reflect society's thinking. Courts seem at times to be ahead of the political readiness, while in other obvious ways they are behind. The political climate of legislatures adds greatly to the litigation equation, as states themselves shape the frequency and intensity of litigation by the legislatures' relative vigilance to equity concerns. While no amount of money can ever satisfy litigants, they are better satisfied when the distribution is fair and minimally adequate. Legislatures, however, are generally faced with competing demands from all corners of society for which sufficient funding is beyond the means of the state. Yet there has been great change flowing from litigation; states have assumed greater shares, taxes have been better equalized, and expenditures are higher. In addition, reform has become a political agenda seized upon by presidents, governors, and legislators. Thus, while equity has far to go, the power of a court should never be underestimated; if it were not for litigation, it is absolutely certain that less progress toward fundamental fairness in the financing of public elementary and secondary education would exist today.

Although these conditions indicate that only uncertainty itself is certain, the long-range view still demands optimism. The political pendulum swings, and equity and adequacy will continue to rise and fade in cycles. It cannot be otherwise because people will protect their resources, giving rise to disputes. Public elementary and secondary education remains a great and noble cause since life's opportunities are in large measure a product of the education received by children. If money were inadequate to these ends, then children in all social and economic circumstances should experience its inadequacy on equal terms.

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[1] Much of this report also appears in a forthcoming issue of *St. Louis University Public Law Review* by R. Craig Wood.

[2] This portion borrows extensively from. R. C. Wood and D. C. Thompson, *Financing Public and Private Education*, forthcoming, Prentice-Hall, 2004.

[3] For a through discussion of education finance litigation see, R. C. Wood and D. C. Thompson, *Education Finance Law: Constitutional Challenges to State Aid Plans, An Analysis of Strategy,* 2d Ed, (Dayton Ohio, Educ. Law Ass'n), 1996.

[4] San Antonio Indep. School Dist. v Rodriguez. 411 U.S. 1 (1973).

[5] See, R. C. Wood and D. C. Thompson, *Education Finance Law.*

[6] P. Kurland, "Equal Educational Opportunity: The Limits of Constitutional Jurisprudence Undefined," *University of Chicago Law Rev.*, 35 (1968), 583-600. *See e.g., Baker v Carr*, 369 U.S. 186 (1962) where accident of geography and arbitrary boundaries of governments may not be a basis for discrimination among otherwise equal citizens, in this instance forbidding the requirement that one must be pay property taxes in order to vote; *Gray v Sanders,* 372 U.S. 368 (1963); *Wesberry v Sanders*, 276 U.S. 1 (1964); *Reynolds v Sims*, 377 U.S. 533 (1964); *Davis v Mann*, 377 U.S. 678 91964).

[7] *See, e.g., Skinner v Oklahoma*, 316 U.S. 535 (1942); *Reynolds v Sims*, 377 U.S. 533 (1964); *Griffin v Illinois*, 351 U.S. 12 (1956).

[8] Litigation regarding this issue is longstanding, e.g., a Massachusetts court in 1850 addressed school segregation under Massachusetts' 1780 equality statute in 59 Mass. (5 Cush.) 198 (1850).

[9] *Brown v Board of Educ.*, 374 U.S. 483 (1954).

[10] *Brown,* at 493 (1954).

[11] *Burruss v Wilkerson*, 310 F.Supp. 572 *affirmed mem.*, 397 U.S. 44 (1970).

[12] *Burruss v Wilkerson*, 310 at 574 (1969).

[13] *Id.*

[14] *McInnis v Shapiro*, 293 F.Supp. 327 (N.D. Ill. 1968).

[15] *Aff'd sub nom. McInnis v Ogilvie*, 394 U.S. 322 (1969).

[16] *San Antonio Indep. School Dist.*

[17] 337 F.Supp. 280 (W.D. Tex. 1971).

[18] *San Antonio,* 411 U.S. 1 at 27-28 (1973).

[19] *San Antonio,* 411 U.S. 1 at 20-22 (1973); noting *Griffin v Illinois*, 351 U.S. 12 (1956) on transcripts; *Douglas v California*, 372 U.S. 353 (1963) on hiring counsel.

[20] It will be seen under state review later that this claim was not entirely novel, as it had been successfully utilized in *Serrano v Priest,* 487 P.2d 1241 (1971) in California. It had not, however, been tried at the federal level even though the state court in *Serrano* invoked the Fourteenth Amendment in its decision. The lack of demarcation between overlapping federal and state chronology should be noted, as state litigation had already begun following *McInnis* and *Burruss*, but prior to *Rodriguez.*

[21] *San Antonio,* 411 U.S. at 37 (1973).

[22] *San Antonio,* at 39.

[23] *San Antonio,* at 42.

[24] *Papasan v Allain*, 478 U.S. 265 (1986); 756 F.2d 1087 (5th Cir. 1985).

[25] Amendment XI to the United States Constitution reads "The judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States by citizens of another State, or by citizens or subjects of any foreign state."

[26] *Papasan v Allain*, 106 S.Ct. 2932 (1987).

[27] Although only four federal cases are discussed herein, there were actually five such cases, as in 1987 plaintiffs in *Livingston v Louisiana State Board of Elem. and Sec. Educ.,* 830 F.2d 563 (5th Cir. 1987) claimed equal protection, arguing that the state aid plan was arbitrary and discriminated against school districts with large homestead exemptions. This case is in note since like *Papasan*; it was narrowly drawn and did not claim inadequate education or a fundamental right.

[28] *Plyler v Doe*, 457 U.S. 202 (1982).

[29] *Plyler,* at 221.

[30] *Kadrmas v Dickinson Public Schools*, 487 U.S. 450, 108 S.Ct. 2481 (1988). For a more complete discussion of *Kadrmas* see, R. C. Wood, "*Kadrmas v. Dickinson Public Schools*: A Further Retreat From Equality of Educational Opportunity," *J. of Educ. Finance*, v. 15, n 3, Winter, 1990, 429-436.

[31] *Kadrmas*, at 429.

[32] School finance litigation could be readily traced into the Nineteenth Century where complex roots of other issues impacting education finance can be understood, e.g., school finance-related litigation can be seen in *Stuart v School Dist. of the Village of Kalamazoo*, 30 Mich. 69 (1874) where a court determined the power to lay and collect taxes for the support of secondary schools; similarly, *see Sawyer v Gilmore*, 109 Me. 169 (1912) in which a court enunciated the *Rodriguez*-like principle of legislative discretion in the manner and amount of tax distributions to schools; similarly, *Morton Salt Co. v City of South Hutchinson*, 177 F.2d 889 (10th Cir. 1949) in which the court noted that no direct benefit need accrue to taxpayers if the taxes were uniform and for public purposes benefiting the entire public; and *Lewis v Mosley*, 204 So. 2d 197 (Fla. 1967) in which the court ruled that laws providing for taxation must be construed in favor of the taxpayer when questions of court discretion arise.

[33] *Serrano v Priest*, 487 P.2d 1241 (1971).

[34] *Serrano*, at 1253.

[35] *Serrano*, at 1252.

[36] *Serrano*, at 1258.

[37] Article IX of the California Constitution, states: "A general diffusion of knowledge and intelligence being essential to the preservation of the rights and liberties of the people, the Legislature shall encourage by all suitable means the promotion of intellectual, scientific, moral, and agricultural improvement."

[38] *Serrano v Priest*, 487 P.2d 1258-59 (1971).

[39] *Robinson v Cahill*, 287 A.2d 187 (N.J. Super. 1972), *Aff'd as mod.*, 303 A.2d 273 (N.J. 1973).

[40] *San Antonio Indep. School Dist. v Rodriguez*. 93 S.Ct. at 1302 (1973).

[41] *Robinson v Cahill*, 303 A.2d at 284 (N.J. 1973).

[42] *Robinson* at 283.

[43] *Robinson*, 303 A.2d 273 (1973); *Abbott v Burke*, 119 N.J. 287 (1990). At the time of this writing the state supreme court has issued thirteen education finance opinions with the most recent being Abbott VII; *Abbott v. Burke*, 751 A.2d 1032, (2000). *See also, Keaveney v. New Jersey Dept. of Educ.* and *Stabaus v. Whitman*, 770 A.2d 1222.

[44] Alabama, *Opinion of the Justices*, 624 So. 2d 107, *see also, Siegelman v. Alabama Assn of School Boards*, WL 729212, (2001); Arizona, *Roosevelt Elem. School Dist. v Bishop*, 877 P.2d 806; Arkansas, *Dupree v Alma School Dist.*, 651 S.W.2d 90 (1983), *but see, Lake View School Dist. v. Huckabee, 340 Ark. 481, 10 S.W.3d 892*, (2000); Connecticut, *Horton v Meskill*, 376 A.2d 359 (1977); 486 A.2d 1099 (1985); see also *Sheff v. O'Neil*, 733 A.2D 925 (1999); Kentucky. *Rose v The Council for Better Educ.*, 790 S.W. 186 (Ky. 1989); Montana, *Helena School Dist. v Montana*, 769 P.2d 684 (Mont. 1989); South Carolina, *Abbeville v. State*, 515 S.E. 2d 535 (S.C. 1999); Texas, *Edgewood v Kirby*, 777 S.W.2d 391 (Tex. 1989), Washington, *Seattle v Washington*, 585 P.2d 71 (Wash. 1978); West Virginia. *Pauley v Kelly*, 255 S.E.2d 859 (W. Va. 1979); Wyoming. *Washakie County School Dist. v Herschler*, 606 P.2d 310 (Wyo. 1980).

[45] R. C. Wood "School Finance Litigation in America," General Session Address before the Education Law Ass'n, Annual Meeting, Phoenix, Nov., 1992

[46] Colorado, *Lujan v State Board of Educ.*, 649 P.2d 1005 (Col. 1982); Florida, *Coalition for Adequacy and Fairness v. Chiles*, 680 So. 2d 400; the most recent case at the time of this writing was *Honore v. Florida* CV 99-17 (dismissed); *Georgia; Thomas v McDaniels*, 285 S.E.2d 156 (Ga. 1981); Idaho, *Thompson v Engleking*, 537 P.2d 635 (Idaho 1975); Illinois, *Committee for Educational Rights v Edgar*, 672 N.E.2d 1178; Kansas, *Unified School Dist. v. State*, 885 P.2d 1170 (1994), see also *Montoy v. State*, No. 99-C-173; Maine, *Sawyer v Gilmore*, 83 A. 673 (Me. 1912); Maryland, *Hornbeck v Somerset County*, 458 A.2d 758 (Md. 1983); Michigan, *Milliken v Green*, 212 N.W.2d 711 (Mich. 1973); *East Jackson Public Schools v State*, 348 N.W.2d 303 (1984). *cert. den.*, 419 Mich. 943 (1984); Minnesota, *Skeen v State*, 505 N.W.2d 299; Montana, *State ex rel. Woodahl v Straub*, 520 P.2d 776 (Mont. 1974); New Hampshire, *Claremont School Dist. v. Governor*, 635 A.2d1375, (1993 see also, *Opinion of the Justices*, 765 A2d 673 (2000); North Dakota, *Bismarck Public Schools v North Dakota* 511 N.W.2d 247; Oklahoma, *Fair*

School Finance Council v State, 746 P.2d 1135 (Okla. 1987); Oregon, *Olsen v Oregon*, 554 P.2d 139 (Ore. 1979); *Coalition for Educ. Equity v Oregon*, 811 P.2d 116 (Ore. 1991), *Withers v. State*, 891 P.2d 675 (1995) and 987 P.2d 1247 (1999); Pennsylvania, *Danson v. Casey*, 399 A.2d 360; South Dakota, *Bezdichek v South Dakota,* CIV. 91-209 (1991); Virginia, *Scott v Commissioner* 443 S.E.2d 138; Wisconsin, *Kukor v Grover*, 436 N.W.2d 568 (Wisc. 1989); *Vincent v. Wright*, 614 N.W.2d388 (Wis. 2000).

[47] *Idaho Schools for Equal Educational Opportunity v. State of Idaho*, 976 P.2d 913.
[48] *Flores v. Arizona*, 48 F. Supp. 2d 939 (1999) in which the court ordered an adequate study.
[49] *Roosevelt Elem. School Dist. v. Bishop*, 877 P.2d 806 effectively overturned the previous Arizona State Supreme Court ruling in *Shotfstall v. Hollins*, 515 P.2d 590 (Ariz. 1973). *See also, Roosevelt Elementary School Dist. v. State*, -- Ariz. ----, 179 Ed. Law Rep. 900, 406 Ariz. Adv. Rep. 33m (2003).

[50] *Leandro*
[51] *Abbeville v. State*, 515 S.E.2d 535.
[52] *DeRolph v. State*, 677 N.E.2d 733 (Ohio 1997): 728 N.E.2d 993 (Ohio 2000) overturned *Board of Education v. Walter*, 390 N.E.2d 813.
[53] *Edgewood Indep. School Dist. v. Kirby*, 777 S.W.2d 391.
[54] *Buse v Smith*, 247 N.W.2d 141 (Wis. 1976).
[55] *Washakie County School Dist. v Herschler*, 606 P.2d 310 at 334 (Wyo. 1980).
[56] J. Augenblick, R. Palaich, and J. Silverstein, *An Estimation of the Total Cost of Implementing the Results of the School Finance Adequacy Study, by Augenblick, Palaich and Associates, Inc.*, (June 2003) Denver, CO, July 2003.
[57] J. Augenblick & J. Meyers, "School Finance Equity & Adequacy in South Carolina," commissioned by the South Carolina School Boards Ass'n.
[58] See California Dept. of Educ. www.de.ca.gov/
[59] "Preliminary Quality Education Commission Report, " August 16, 2002. Quality Education Commission, Salem, Oregon.
[60] This section is adapted from R. C. Wood and D. C. Thompson, *Financing Public and Private Education*, Prentice-Hall Pub. Co., forthcoming, 2004.
[61] Dist. Court, Shawnee County, Ks, Div. Six, Case no. 99-2-1738,
[62] *Montoy* at 37 (unnumbered).
[63] *Id.* at 46 (unnumbered).
[64] *Id.* at 50 (unnumbered).
[65] 20 USCA § 6738.
[66] *See, Lake View v. Huckabee,* 10 S.W.3d 892 (2000) procedural history is recounted in *Lake View Sch. Dist. v. Huckabee*, 340 Ark. 481, 10 S.W.3d 892 (2000). *See also Tucker v. Lake View Sch. Dist.* 323 Ark. 693, 917 S.W.2d 530 (1996). *Lake View School Dist. v. Huckabee,* 76 S.W.3d 250, 349 Ark. 116
[67] L.O. Picus and Associates, "An Evidenced-Based Approach to School Finance Adequacy in Arkansas," Prepared for the Arkansas Joint Committee on Educational Adequacy, North Hollywood, CA, September 1, 2003.
[68] *See, Miller v. Korns*, 140 N.E. 773 (1923) and *Board of Educ. V. Walter*, 390 N.E.2d 813.
[69] 677 N.E.2d 733.
[70] 678 N.E. 2d 123
[71] 728 N.E. 993.
[72] 780 N.E.2d 529.
[73] 754 N.E, 1184.
[74] 780 N.E.2d 529 (*DeRolph IV*)
[75] *State ex Rel. State v. Lewis*, 789 N.E.2d 195.
[76] *Cert denied, DeRolph v. Ohio*, Oct. 20, 2003, 2003 WL 21956401, 72 USLW 3147, __S.Ct.__.
[77] 468 S.E.2d 543 (1996).
[78] *See, Hoke County Board of Educ. v. State*, Oct. 12, 2000, 2000WL 1639686
[79] *Campbell County School Dist. v. State*, 907 P.2d 1238 (Wyo. 1995)
[80] *State v. Campbell County School Dist.* 19 P.3d 518 (Wyo. 2001); *see also State v. Campbell County School Dist.* 32 P. 2d 325 (Wyo. 2001).
[81] *McDuffy v Secretary of Educ., 615 N.E.2d 516.*

[82] www.goodschoolsformass.org/.
[83] *Campaign for Fiscal Equity v. State*, 2003 WL 21468502 (N.Y.), 2003 N.Y. Slip Op. 15615, __N.E.___.
[84] *Campaign for Fiscal Equity* at 106.

[85] *Edgewood v Kirby*, 777 S.W.2d 391 at 398 (1989).
[86] R. C. Wood "School Finance Litigation in America," Education Law Ass'n,; see also R. C. Wood and J. Maiden, "Resource Allocation Patterns Within School Finance Litigation Strategies," *Where Does the Money Go?* L. Picus and J, Wattenbarger, ed's, Sixteenth Ann. American Education Finance Ass'n Yearbook, 197-211 (1995)

[87] This discussion is confined to changes brought about by the legal system itself. It does not consider other strategies such as Congressional action or Constitutional amendment to achieve the same ends.

[88] *Pauley v Kelly*, 255 S.E.2d 859 (W. Va. 1979). *Pauley* stands almost alone in the court's willingness to engage in judicial remedy for fiscal inequities. The court ordered creation of a Master Plan addressing in minute detail each deficiency of educational program and its support mechanism, which today has resulted in millions of new dollars to education and massive restructuring of education on a statewide basis that is linked to student outcomes. To some extent, the same remedy can be seen in Kentucky where *Rose v Council,* 790 S.W. 186, required total reconstruction of the educational system.

[89] *Serrano II*, 557 P.2d 929 (1976).

[90] *Horton II*, 486 A.2d 1099 (1985).
[91] For a complete discussion of this case see, R. C. Wood, "*Scott v. Commonwealth*: Virginia Courts Consistently Rule Against Education Finance Equalization Claims," West's *Educ. Law Reporter*, v. 115, n. 1, 1-7.
[92] For an analysis of education finance litigation via a political/social interpretation see, K. DeMoss, "Political Dispositions and Education Finance Equity: An Analysis of Court Decisions Across the United States, Ph.D. Dissertation, University of Chicago, 2001.

[93] Even where courts have become enthusiastic in judicial prescription, they have usually later modified their zeal. *See, e.g., Pauley v Kelly*, 255 S.E.2d 859.
[94] The question whether litigation actually leads to significant financial reform, that is, greater equity as well as adequacy has yet to be clearly defined, *see e.g.*, "A Statistical Analysis of the Effect that Education Finance Litigation Has On Per Student Revenues in the United States," M. Petko, (Ph.D. dissertation, Univ. of Florida).

[95] *Sawyer v Gilmore*, 83 A. at 677. 191.

APPENDIX A

MEASUREMENT OF EDUCATION FINANCE[i]

The inequity in financing public elementary and secondary education is largely a function of the failure to redress the inadequacies of the local tax base. It must be clearly understood that wealth distribution varies naturally, and thus inequity must follow unless intervention occurs. This can be viewed as a strength, as well as a weakness, within any capitalist society. In education finance, intervention in unequal wealth distribution is mandatory because equal educational opportunity is in part a function of purchased resources. The method of intervention is a function of the state distribution aid formula to local school districts in order to offset the effects of tax base differences.

However, the measurement of the fiscal strengths, or weaknesses, of an education finance distribution formula lies in the realm of scholarly research within education finance. Despite popular literature and items of an anecdotal nature that appear in daily newspapers throughout the nation regarding conditions found within public schools, these conditions do not necessarily result as a function of the education finance distribution formula. Hence, it must be understood that the measurement of the acceptance or the weakness of an education finance distribution formula is largely a statistical analysis in light of the applicable state constitutional requirement. The foundation for the concept of equity, the defense of any school tax or revenue distribution plan should be tied to its effect on educational opportunities for children. If taxation were meant to provide school revenue, then moneys should flow to school districts. If equal opportunity were required, then equity in revenue distribution should follow. Thus, since tax equity is not natural, the local nature of schools prevents natural equity in revenue distribution. The logical tool to redress revenue inequity becomes the education finance distributional formula. Finally, the evaluation of an education finance aid formula rest in its contribution to equal opportunity through its ability to equalize the financial resources that purchase education in every community within a state.

Research in the area of education finance typically consists of statistical evaluation of ongoing education finance distribution formulas. Thus, the design of the research does not control the variables or the setting. This type of research is totally post hoc and evaluative in nature. Generally, education finance research does not test for statistical significance. This is due to the fact that education finance studies generally examine the total population rather than a sample of the population. In this manner, studying the entire population of all school districts allows for research questions with final answers and statements of conclusion based on the entire set of data. Education finance studies generally do not attempt to test an hypothesis but rather to address a posed research question. Generally, the research questions are posed along the lines of addressing the horizontal and/or vertical equity and the adequacy of public elementary and secondary education within a given state. Many of the education finance studies are examinations of the education finance distribution formulas over time or in comparison of the present formula to the previous formula. Often, the study is an examination of a given education finance distribution formula in terms of equity. On many occasions the education finance study is an examination of the educational as well as the

economic and political policy issues surrounding a state or national educational policy in terms of its fiscal dimensions.

Measuring Formula Equity

While it is equally conceded that absolute fiscal equality would not automatically result in equally absolute quality, it can be shown that variations in funding at least accompany and perhaps impact the level of educational services and productivity represented by the school districts in the nation. There has been a further intentional implication that the highly state-specific nature of school finance results in differential funding, induced in large part by different aid mechanisms that perform variably under equity examination. In that whatever inequities that may exist within a given state may be a function of the state education financial aid distribution formula, the finance distribution formula must be constantly evaluated in a manner that is acceptable to education finance research standards.

First, education finance is not, within the foreseeable future, destined to leave the control of states; a reality, which notes that states, in turn, control local school districts. Second, this observation is supported by the reality that states are becoming more, rather than less, responsible for education and all of the issues of accountability surrounding education. Both paths thus need to be pursued simultaneously, but vigilance concerning state aid formulas will continue to be a primary thrust of education finance researchers the courts, and state policymakers.

Measurement of formula equity is generally focused along three dimensions that relate to horizontal and vertical equity. Most state policy makers' concentrate on horizontal equity, if for no other reason than it is easier understood and measured within the discipline. In addition, vertical equity is extraordinarily complex so that agreement concerning the measurement or achievement is not assured, and its costs are often thought to be prohibitive. Further, vertical equity may presume a focus on educational outcomes among unequal populations. The bulk of equity measurement has occurred in horizontal generalities concerning state education finance distribution formulas along the three dimensions of resource accessibility, wealth neutrality, and tax yield.

Resource accessibility refers to the concept of measuring whether all students in a given state have equal access to resources. Wealth neutrality carries that concept to the next level by asking whether the available resources are related to the accident of location, i.e., school district wealth.

Tax yield naturally speaks to the issue of unequal wealth by asking whether a state education finance distribution formula offsets these inherent inequalities given the natural state of unequal wealth distribution. At once singular and interdependent, the equity performance of any state aid formula may be tested on these dimensions using a set of common statistical tools.

Resource Accessibility

Resource accessibility is primarily concerned with determining whether all students of a given state have equal access to the fiscal resources represented in a given state by the legislature in its appropriations as well as the applicable local revenue that may be available. If it were to be discovered that no substantive differences in wealth existed, then the standard could be technically violated while substantively vacuous. Reality, however, suggests the

unlikelihood of a smooth wealth distribution. As a result, the task of determining resource accessibility is one of measuring degrees of noncompliance. This means comparing the level of resources among school districts with a common set of statistical tools and making judgments regarding the relative achievement of equity among all school districts in the state.

While there are numerous ways of reaching that goal, several measures of equity utilized to evaluate resource accessibility include the *mean, range, restricted range, federal range ratio, standard deviation, coefficient of variation*, and *variance*. Certain statistical measures are quite common in social science research while others are usually only utilized in the arena of education finance. These statistical tests are usually applied, by group, to a number of variables that represent items such as budgets, expenditures, wealth, budget surplus, and tax rates for each school district in a distribution and so on. The school districts in these analyses can be selected to represent any number of comparisons. For example, an analysis might examine all school districts or only large school districts or small school districts. Similarly, the analysis might select groups of large and small school districts for specific comparison purposes. Analyses can be built in almost infinite ways. The purpose and outcome can be easily understood, however, given two important observations. First, the analysis will be specific to the given structure of a state and the research questions that initially sparked the investigation. Second, an understanding of these basic tools is needed to know whether the application is appropriate to a given situation. As such, each analysis will be different and may not include every tool discussed herein, or alternatively, may use other tools not identified in this text. In the realm of research in the financing of elementary and secondary education finance the researcher generally utilizes multiple measures. Thus, an overall conceptual picture may be viewed. Each measure tends to have its strengths and weaknesses. This appendix addresses the most commonly utilized measures that have been accepted within the research literature. Other measures may appear from time to time but have yet to appear across time within the scholarly research literature. It is well accepted by the research discipline that all measures are value laden.

Each state presents to the researcher a unique set of problems and unique data limitations. Statistical measurements may be utilized to gain insight into both horizontal and vertical equity considerations. Each state has a different database that presents unique strengths and weaknesses to the education finance researcher. While states share certain similar types of data each is unique in terms of its tax structure, its revenue pattern to the school districts, as well as the nature of the financial independence or dependence of the school districts. Most education finance researchers agree that generally the best measure to be utilized is the total of local and state expenditures per pupil. Again, this is subject to the nature of the study, the nature of available data, and the research question that the researcher is pursuing. Thus, for example, the researcher must decide the appropriateness of including special education expenditures. However, most education finance researchers would agree to the concept of state and local fund expenditures on a per pupil basis. Further, most education finance researchers would tend to agree that the vertical equity as well as the horizontal equity should be measured and accounted for at the same time. The nature of the design can be found in a number of scholarly referred journals.

Mean

Although not a highly sophisticated tool, the mean is often the first tool to be applied in considering resource accessibility. The mean is a measure of the central tendency of the distribution of observations, i.e., the mean represents the average value in the distribution of a variable. The mean takes into account all the observations in the distribution. The mean is calculated by a simple formula

$$\Sigma Xi \div N$$

where :

Σ is the sum of all districts:

Xi is the value of a given variable in district i, and

N is the number of districts.

Solving this formula yields a single number for comparison purposes. For example, if the sum of wealth of all districts in a state were found and divided by the number of districts, the mean wealth would be known. Using dummy data, this can be illustrated as \$2,000,000,000 ÷ 100 = \$2,000,000 where the sum of all school district wealth is \$2 billion, the number of districts is 100, and the mean district wealth is \$2 million. Each school district, however, will not have exactly \$2 million in local wealth. Individual school districts can then be compared to the mean for a crude estimation of variation. While the mean alone does not prove anything concerning resource accessibility, it is an excellent first step in assessing wealth variation because wide differences from the mean unredressed by the state aid formula could suggest inequity.

Range

The range is a second measure that can be utilized to demonstrate simple differences in a distribution. The range is defined simply as the difference between the highest and lowest observations in a distribution. The smaller the value of the range, the smaller the variation in the distribution of a variable; likewise, the smaller the variation, the better the equity of the distribution. The range is easily found by the formula

Highest Xi - Lowest Xi

Where:

Xi is the variable considered in district i.

Solving the formula yields a single number for the entire distribution. Using the same example but expressed as per-pupil wealth, the highest wealth district might have wealth of \$500,000 compared to the lowest district with wealth of only \$6,000 per pupil. In this case, the range is \$500,000 - \$6,000 or \$494,000. Obviously, as a measure of equity the usefulness of the range is limited because it is based on only two values, does not show patterns of

variation, and is not sensitive to changes in the distribution. It must be clearly understood that many states have a few "lighthouse school districts" that spend very large amounts of moneys and perhaps a few that spend very little. If these numbers are indeed very few, then these are thought to be outliers that do not accurately reflect the overall education finance distribution formula. The question is one of determining if the education finance distribution formula takes these school districts into account. Thus, the range is a useful tool for raw wealth measurement in that a wide range unredressed by the aid formula could suggest inequity.

Restricted Range

The restricted range is a third measure that overcomes some of the problems of the range. The restricted range is defined as the difference between the observation at the 95th percentile of the distribution and the 5th percentile. This is useful in viewing the total distribution because it eliminates the effect of extreme values that can misrepresent a distribution. The difference is found in that the restricted range eliminates all values below the 5th percentile and above the 95th percentile. The restricted range is easily calculated by the formula

Xi at 95th percentile - Xi at 5th percentile

where

Xi is the variable considered in district i.

Solving this formula yields a single number for the distribution. Using the same example of per-pupil wealth, the highest wealth district at the 95th percentile might have wealth of $100,000 compared to the 5th percentile district wealth of $35,000 per pupil. As such, the restricted range is $100,000 - $35,000 or only $65,000. A very different picture is thus obtained in which extremely wealthy and poor districts at the top 5 percent and bottom 5 percent of the state distorted the total picture. As the restricted range decreases, equity increases. Although basic, the restricted range is helpful by reducing the distortion of a few extreme school districts.

Federal Range Ratio

Still a fourth tool is the federal range ratio. Originally designed as a federal test to measure whether states met federal wealth neutrality guidelines in distributing federal funds, the federal range ratio is simply the restricted range divided by the revenue per pupil per district at the 5th percentile. The federal range ratio is calculated as

Restricted Range ÷ Xi at 5th percentile

where

Xi is the revenue per pupil in school district i.

Solving the formula yields a value expressed as a ratio wherein the smaller the value, the less variation or inequity in distribution. Using the same example of per-pupil wealth, the federal range ratio would be found as $65,000 ÷ $35,000 or 1.857. This number has utility primarily as an alternative expression of relative equity achievement and is subject to the same uses as the restricted range because it is based on that measure. The closer the number is to one the greater the degree of equity.

Standard Deviation

A fifth expression of differences in a distribution is found in the standard deviation. The standard deviation is defined simply as the square root of the variance as calculated by the formula

$$\sqrt{\sum Pi\ (Xp - Xi)^2 \div \_Pi}$$

Similar to other measures described herein, the smaller the calculated value, the smaller the variation in the distribution of revenues per pupil, i.e., the greater the equity. The standard deviation is based on assumptions concerning normal distributions of a bell curve and may thus be instructive concerning how an education finance distribution formula affects various groups. The advantage of the standard deviation is that all observations are included in the calculation and the units of measurement are in the original scale. However, it is sensitive to outliers that could skew the distribution.

Variance

A sixth tool for defining resource accessibility is the variance. The variance is defined simply as the average of the squared deviations from the mean as calculated by the formula

$$\sum Pi\ (Xp - Xi)^2 \div \sum Pi$$

where

$\sum$ is the sum of pupils in all districts;
Pi is the number of students in district I;
Xp is the mean of some tested variable for all pupils, and
Xi is the same variable in district i.

When the results of the formula are obtained, the smaller the variance, the smaller the variation in the distribution of a given variable--hence, greater equity.

Coefficient of Variation

A seventh tool is the coefficient of variation. This measure is simply the standard deviation divided by the mean, or the square root of the variance divided by the mean. The coefficient of variation is expressed as the ratio of the standard deviation of the distribution to the mean of the distribution, calculated by the formula

$$\Sigma[\Sigma Pi\ (Xp - Xi)^2 \div \Sigma Pi] \div Xp$$

where

Xp is the mean of some variable for all school districts.

Solving the formula yields a single value between 0 and 1 wherein smaller values demonstrate smaller variations in the distribution, thereby indicating greater equity. While many uses of the coefficient of variation can be found, one example could compare differences in expenditure levels among school districts in a state aid distribution formula that utilizes economies of scale as a basis for different levels of expenditures per pupil. For statistical purposes, the coefficient of variation can be important when sensitivity to outliers, but not to changes in scale, is required.

These measures of resource accessibility should be recognized as overlapping and almost redundant in some instances. As such, not all of these measures need to be utilized in analyzing resource accessibility, but each measure has assumptions and weaknesses implicit that should govern the selection among alternative choices. In addition, resource accessibility is merely a first step in measuring education finance equity. It is an important step, however, because equal access to resources is an obvious precondition of equal educational opportunity. It is equally important, however, to go beyond resource accessibility to determine whether differences are related to variations in wealth or whether other explanations are possible.

Wealth Neutrality and Tax Yield

Education finance researchers often want to determine whether wealth neutrality and equal tax yield are demonstrated by an education finance distribution formula. Similar to resource accessibility assessments, the range of choices in tools for evaluating wealth neutrality and tax yield is large. The conditions surrounding each research project are different, and the reservations of the researcher and the vagaries of each state can help establish the most appropriate tools. Three of the more common statistical measures used to assess wealth neutrality and equivalency of tax yield, however, are the McLoone Index, the Gini coefficient, and correlational analysis and regression.

McLoone Index

The McLoone Index is a measure unique to education finance that was designed to demonstrate the degree of equity in the lower half of a distribution. The McLoone Index is the ratio of the sum of observations below the median to the sum of all observations that would be required if all observations below the median were brought up to the median level. This can be better grasped in the example of expenditures per school district. In this instance, the McLoone Index is the ratio of the sum of expenditures per district for all school districts below the median to the

sum of all expenditures that would be required if all school districts below the median were brought up to the median level expenditure. The McLoone Index is calculated using the expenditure example, by the formula

$$\Sigma(1...j)\ PiXi \div Mp\ \Sigma\ (1...j)\ Pi$$

where;

districts 1 through *j* are below the median,

Σ is the sum of pupils in all districts 1 to j,

Pi is the number pupils in district i,

Xi is the expenditure per pupil in district i, and

Mp is the median expenditure per pupil for all districts.

Solving the formula gives a value where the larger the value of the McLoone Index the closer the lower half of the distribution is to the median of the distribution. This index is usually between 0 and 1.

Gini Coefficient

The Gini coefficient is a measure of income equality that indicates how far the distribution is from providing each percentage of a population with the same percentage of a variable such as how far the distribution of expenditures is from providing each percentage of students with the same expenditure, or expenditure inequality. The Gini is calculated, using the expenditure example, by the following formula

$$\Sigma i\ \Sigma j\ PiPj\ (Xi - Xj) \div 2(\Sigma i\ Pi)^2\ Xp$$

where:

Σ is the sum for all pupils in districts i and district j,

Pi is the number of pupils in district i,

Pj is the number of pupils in district j,

Xi is the expenditure per pupil in district i,

Xj is the expenditure per pupil in district j, and

Xp is the mean expenditure per pupil for all districts.

Solving the formula yields a value from 0 to 1 where the smaller the value of the Gini coefficient, the more equitable the distribution of expenditures in providing a specified percentage of students with the same percentage of expenditures. The coefficient compares expenditures at each level with expenditures at every other level so that perfect equity grants exactly equal proportions of expenditures to exactly equal proportions of the population. For

example, 50 percent of a population should receive 50 percent of all resources. The Gini is sensitive to changes throughout the distribution, though not to extreme outliers.

The Gini index is a measure of two variables. Typically, the poorest to the wealthiest school district is ranked compared to a cumulative percentage of FTE students. Typically, a distribution is made based on revenues and graphed to form the Lorenz curve. If the wealth of the students were perfectly equal in that the percentages of funds received were equal to the percentage of students the Lorenz curve will be a perfect 45° line on the graph. If the line were not a perfect 45° this indicates a level of inequality. Generally, the Gini index is greater than zero.

Simple Correlation and Regression

In assessing school finance equity, it is important to be able to estimate relationships that may vary in association. While all the measures described to this point are highly useful by providing different kinds of data concerning variables such as wealth and revenues and expenditures, they are insufficient to do more than simply describe selected variable. As such, all the foregoing measures are univariate in that they deal with the dispersion or variation of a single variable. To complement these tools, there are many other measures that describe relationships between two variables. Regression-based measures are especially helpful in that they describe how variables perform in relation to each other and further allow, in some instances, inference concerning causation. Correlations and slopes are two regression-based measures that are included in this discussion of wealth neutrality and tax yield because they can indicate the degree to which district wealth and revenue are associated. Similarly, these measures are useful in assessing taxpayer equity by examining tax yield as measured by wealth neutrality.

Simple correlation is a statistical tool that describes the degree to which two variables are associated with each other. For example, the two variables of wealth of school districts and expenditures per pupil could be examined for possible association. When these two variables are thus examined, the result is viewed as a description of the fiscal neutrality of a state aid formula. These variables are tested through correlation and regression analysis to confirm or deny a state's contentions that the formula is fiscally neutral. If the formula were indeed neutral, the analysis will indicate that no relationship between wealth and revenue per pupil.

Several correlation procedures are possible based on the types of variables in question. For most purposes, the Pearson correlation coefficient is the appropriate tool and is calculated, using the expenditure example, as

$$Pi(Xi - X)(Wi - W) \div [\sqrt{\sum Pi(Xi - X)^2}][\sqrt{\sum Pi(Wi - W)^2}]$$

If this example of correlating wealth and expenditures were the object of inquiry, the formula would be run

Where

$\sum$ is the sum of pupils in all districts,

Pi is the number of pupils in district i,

Xi is the expenditure per pupil in district i,

X is the mean expenditure per pupil for all districts,

Wi is the wealth per pupil in district i, and

W is the mean wealth per pupil for all districts.

The correlation coefficient would then yield a value ranging from -1.0 to +1.0. When two variables are positively associated, larger values of one tend to be accompanied by larger values of the other; conversely if two variables were negatively related, larger values in one tend to be accompanied by smaller values of the other. A value of +1.0 indicates a perfect positive linear relationship and a value of -1.0 a perfect negative linear relationship, while a value of 0 indicates no relationship. As a measure of fiscal neutrality, a correlation coefficient of 0 would indicate a lack of any relationship between wealth and expenditures. Generally, inference concerning causation is available as well through accompanying regression analysis wherein the square of the correlation coefficient explains the amount of change in one variable caused by the other.

The results of all these tests yield a set of observations concerning the equity of a school finance formula. As stated previously, other tests can be utilized as well, but the objective is always to gain the best picture of a state's education finance distribution formula regarding the three dimensions of resource accessibility, wealth neutrality, and tax yield. Under these conditions, a formula should yield proof that resources are equally available to all children, that variation in resources is not related to local wealth patterns, and that equal tax yield follows from equal tax effort. If the analysis fails to yield favorable results, the formula should be adjusted or abandoned.

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i Much of this Appendix is adapted from R. Craig Wood and David C. Thompson, *Public School Finance*, forthcoming, Prentice-Hall, 2005.