WIDE OF A REASONABLE MARK:
EVALUATING THE SUITABILITY OF THE KANSAS SCHOOL DISTRICT FINANCE AND QUALITY PERFORMANCE ACT

Expert Testimony in the Case of Montoy v. Kansas

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EXECUTIVE SUMMARY

REASONABLE MARK 1: An appropriately designed "cost adjusted two tiered" state aid formula includes a first tier that is, at its basic level, adequate or suitable for achieving desired outcomes. An appropriately designed "cost adjusted first tier" includes empirically justifiable cost adjustments to accommodate district needs like economies of scale and student needs like English language deficiencies or economic disadvantage.

1. The first tier, or General Fund Budget component of the School District Finance Act overstates economies of scale through the faulty original calculation and crude implementation of the low enrollment weight, resulting in under-funding of all of the state's larger districts (relative to smaller ones).
    a. Relative to the legislature's own *input standard of suitability* as measured in the report by Augenblick and Myers, large districts in the state receive the least suitable funding, and funding that is wide of the legislature's own reasonable mark for large districts.

2. The first tier of SDF provides no measurable, systematic differentiation of funding for student needs, especially for high poverty larger districts like Kansas City, Topeka, Dodge City or Garden City, when compared with low poverty large districts, like Blue Valley.
    a. Relative to the legislature's own *suitability standard,* larger districts with more children in poverty presently have substantially less suitable funding than larger districts with fewer children in poverty as well as less suitable funding than smaller districts. In this regard, SDF is wide of the legislature's own reasonable mark.
    b. Relative to empirical evidence from research literature, and cost indices estimated in other states like Texas, Kansas' larger districts with high poverty rates receive far too little funding when compared with Kansas larger districts with low poverty rates and when compared to Kansas' smaller districts. This finding is consistent with 2a above, indicating that patterns of cost adjustment under SDF are not just wide of the legislature's own reasonable mark, but "wide of any reasonable mark."
    c. In the Kansas City metropolitan area, low poverty large districts like Blue Valley receive more (nearly 10%) in "cost adjusted aid" than high poverty large districts like Kansas City, implying that the legislature believes it to be more costly to achieve desired outcomes with children from higher income, more educated families that attend new facilities than to achieve desired outcomes with low income children with increased prevalence of English language deficiencies. It is difficult, if not impossible to conceive of a "rational educational explanation" for this discrepancy.

3. For larger Kansas districts, the first tier of SDF was inadequate to begin with, and over the past ten years has become even less adequate.

a. From 1992 to 2001, current instructional expenditures per pupil for Kansas K-12 districts went from 7% to 15% behind national average current instructional expenditures per pupil for K-12 districts. For districts with 1,725 to 5,000 pupils, instructional spending started at 18% behind national average spending and ended at 20% behind and for districts with 5,000 to 10,000 pupils, the gap grew from 17% behind to 25% behind. Districts in 42 states experienced faster growth in instructional expenditures than did districts in Kansas.
b. From the outset of SDF, instructional spending alone equaled over 80% of general fund budgets per pupil for districts enrolling over 10,000 pupils and over 70% for districts enrolling over 5,000 pupils, leaving little left to cover non-instructional costs like administration, maintenance and operations and transportation. As such, larger districts were immediately required to implement local option budgets to maintain suitable funding.
c. From the outset of SDF, current expenditures (instruction, administration, maintenance and operations, food and transportation, but excluding special education) in districts with over 10,000 pupils exceeded their general fund allocations by 21%, a gap which grew to 27% by 2001. As such, local option budgets in these districts needed to be nearly maximized at the outset of SDF and exceeded their limit by 2001. For districts of all sizes, current expenditures had outstripped general funds by 1997.

REASONABLE MARK 2: An appropriately designed second tier of a cost adjusted two tiered formula would (a) be used only to enhance the quality of schooling above and beyond an adequate or suitable first tier and (b) consist of an appropriate mix of local effort, based on taxation of primary residential properties, coupled with matching aid provided by the state through a formula that takes into account a variety of measures of local fiscal capacity. The state role should be to limit the extent to which education quality varies in direct relation to local wealth and income. Where first tier funding is suitable, and where matching aid on second tier funding is appropriately sensitive to local capacity, limitations on local taxation should be unnecessary and may result in "leveling down."

1. The cap on local option budgets, coupled with the under-funding of the first tier of SDF has led to:
    a. An unprecedented "leveling down" of education spending, with districts in 42 states exceeding (statistically significantly) the instructional spending growth of Kansas districts from 1992 to 2001, and districts in no state increasing instructional spending more slowly than Kansas districts over that period.
    b. Emergence of various "games" played by local administrators and boards of education, and growth of "unofficial" tiers of additional operating revenue in an effort to keep districts financially afloat.

2. The Kansas School District Finance Act now has four additional tiers of revenue that may be used to enhance annual operating budgets. In some districts, the additional

tiers raise as much as 52% above general fund budgets per pupil, and in many districts substantial supplemental revenues were required from the outset of SDF. The four tiers include:

a. *Local Option Budgets*, which remain statistically associated with district median family income, such that districts with higher median family income have, on average, larger local option budgets. In addition, the counting of special education aid toward LOB authority calculation resulted in an effective increase of the LOB cap to over 30%. The LOB has insufficient matching aid, equalized only to the 75%ile property wealth, and accounting for no other local capacity measures. In some districts, an additional $1,000 per pupil in LOB revenue costs less than .1% of median family income, while in others it costs .44% of median family income.
b. *Capital Outlay Mill Levies*, which are strongly associated with measures of both tax price (property wealth) and income. Capital outlay revenues are increasingly used to offset operating costs, and are not accompanied by any matching aid from the state. In some districts, an additional $1,000 per pupil in LOB revenue costs less than .12% of median family income, while in others it costs more than 1.0% of median family income (a nearly 10X difference).
c. *County and city sales taxes*, where the capacity of local districts to take advantage of county or city sales taxes varies widely across the state. Again, no state aid is provided to assist districts with less capacity to use sales taxes.
d. *Private contributions*, which appear to be increasing in recent years, but remain a relatively small share of district's annual revenues (0.2%).

REASONABLE MARK 3: An appropriately designed accountability system would allow state officials to precisely, reliably and validly evaluate the effects that teachers, schools and districts have on each child's learning, toward the objective of insuring that all Kansas children have the opportunity to attend "suitable" schools.

a) QPA allows school leaders to pick and choose their goals and measures to indicate that they are making progress toward their goals, resulting in no reliable way in which to compare and evaluate the quality of Kansas schools.

b) The Kansas State Assessment System does not allow for the tracking of individual student's performance gains over time, as they attend a specific school or district. As such, it is impossible to discern teacher, school or district effects on children's learning/performance. That is, "school quality" cannot be measured in Kansas, despite the claim that QPA focuses on "school quality." Student performance measures in QPA represent the most crude and least meaningful type of school quality measure among approaches presently in use by states.
    a. As a result, school ratings under QPA, like meeting the "standards of excellence" are highly associated with district socio-economic characteristics, raising the following concerns:
        i. If the legislature and board of education believe the "standards of excellence" to be meaningful, then they must recognize that

"excellent schools" are dramatically disparately distributed by race, poverty, income and parent education level.

ii. Alternatively, if the legislature chooses to acknowledge that the "standards of excellence" merely measure student background characteristics, then QPA is not useful for evaluating schooling quality. As such, QPA fails to assist the legislature in meeting its duty to Kansas children.

c) Recent research on the effects of accountability systems on student outcomes rated the Kansas system as "weak," or a "1" on a "0 to 5" scale, with "5" being the strongest. That same research found that stronger accountability systems positively influence student outcomes.
   a. QPA includes negligible consequences for schools. Under QPA, all schools are accredited, despite chronic underperformance of some schools, and negligible evidence of "continuous improvement."
   b. Even if legislators and the board of education wanted to "strengthen" QPA, the present system of state assessments would not allow for appropriately rigorous measures of schooling quality.

REASONABLE MARK 4: An appropriately designed school funding system would promote an equitable distribution of quality teachers. For example, in metropolitan labor markets in which poor urban and wealthier suburban districts compete for teachers from the same pool, state school finance policy should ideally support the ability of poor urban districts to pay salary premiums to attract high quality teachers that would typically avoid those districts. At the very least, school finance policy should not include provisions that (a) overcompensate wealthy suburban vs. poor urban districts, or (b) limit urban districts ability to compete for teachers of similar quality.

1. The "cost adjusted" first tier of SDF actually provides greater cost adjustment for wealthy suburban than for poor urban districts in the Kansas City area, and does so primarily via new facilities aid. From a teacher labor market perspective, one might argue that it would be less expensive to recruit a teacher of comparable quality into a district if that district could offer the teacher a position in a new, well equipped, comfortable facility, especially where that facility serves a more advantaged student population.

2. The cap on local option budgets, and the fact that the cap is relative to cost adjusted first tier aid, would prohibit poor urban districts from paying necessary salary premiums even if they wanted to.
   a. In Kansas, teachers with stronger academic preparation work in districts that have higher current expenditures per pupil. In Kansas, this difference is larger than in most states (Kansas ranks 39th in the size of this spending gap, in order of smallest to largest gap).

3. Kansas has among the larger "poverty gaps" (ranking 36th to 38th nationally, in order of smallest to largest gap) between schools and districts with high quality teachers and schools and districts with lower quality teachers, based on quality indicators shown to influence student outcomes in empirical research literature. Kansas schools and districts with teachers with stronger academic undergraduate backgrounds serve fewer children in poverty.

REASONABLE MARK 5: An appropriately designed program of allocating aid to districts to meet the needs of children with disabilities should logically integrate general education funding with supplemental/categorical funding such that the combination of the two funding sources yields funding sufficient to meet the needs of individual students, regardless of the district they attend, or the type of placement.

1. The present system of allocating shares of personnel costs to meet the needs of children with disabilities is conceptually appropriate, but flawed in its application in two major ways:
    a. In general, the state has failed to cover fully the excess costs associated with meeting the needs of children with disabilities, leading to further reduction of available general funds, which more severely affects general education programs in midsized to larger districts with fewer available general funds from which to draw and higher average special education costs per special education pupil.
    b. Special education aid continues to be poorly integrated with general fund aid, toward the above stated objective. Present and recent allocations of special education aid are significantly misaligned with estimates produced by Augenblick and Myers, especially for larger districts. A previous legislative post audit suggested similar problems. It is unlikely that special education aid can be adjusted in any logical way to compensate for the gross errors in general fund aid allocations.
        i. Special education aid would essentially need to be means-tested and weighted accordingly to balance the effects of miscalculated and/or arbitrary cost adjustments to general fund aid, leading to a particularly convoluted system of aid allocation. It seems more logical to first remedy problems with general fund aid.

Detailed Summary of "Reasonable Marks" for State School Finance and Accreditation Systems and the Present Status of SDF/QPA

Formula Component	Reasonable Mark	School District Finance and Quality Performance Accreditation Act
Cost Adjusted Tier I		
Base aid per pupil	Base aid should be set at an adequate level for operating the district with "average cost of achieving specified outcomes" (if adjustments are to be made above and below base aid) or set at the adequate spending level of the district with the lowest costs (due to structural characteristics, regional prices and student population characteristics) of achieving given outcomes. Base aid should increase appropriately over time to account for changing prices and demographic shifts that may influence the cost of achieving given outcomes.	The initial base aid per pupil in SDF of $3,600 was arbitrary, and not based on any type of empirical analysis of the either the cost of achieving specific outcomes or the cost of purchasing specific inputs. Evidence in this report suggests that the base was insufficient from the outset to support operating costs in large districts. Further, the base grew to only $3,863 over a ten year period, leading to dramatic fall of in Kansas per pupil revenues compared with national averages. Recent empirical analyses based on the legislature's own "input standard of adequacy" identify a basic cost per pupil of $5,811 in the largest districts.
Low enrollment weight	Economies of scale adjustments should accommodate higher "necessary" costs associated with operating districts that have no other option but to operate at inefficient/more costly scale.	The low enrollment weight in SDF is both incorrectly shaped, and significantly misaligned in magnitude. Shape errors alone (drawing straight lines instead of a curve) produce aid allocation errors of over 10% (over $386 per pupil) for districts with 600 to 1000 pupils. Shape and magnitude errors combined produce aid allocation errors of over 20% (over $772 per pupil) for districts with 600 to 1000 pupils. Further, small districts may receive this additional subsidy even if they are directly adjacent to larger districts.
At risk weight	At risk weights or compensatory aid adjustments should provide sufficient cost adjustment to theoretically achieve	The at-risk weight of .10 in SDF is not based on any empirical evidence of the cost of achieving specific

Formula Component	Reasonable Mark	School District Finance and Quality Performance Accreditation Act
	comparable outcomes with children from economically deprived backgrounds. For example, should be large enough such that poor urban districts in a metropolitan area receive substantially more Tier I aid per pupil than wealthy suburban districts toward achieving the same goals.	outcomes or of providing given inputs. In addition, recent empirical analyses conducted for the legislature (Augenblick and Myers) suggest the need for (a) far more supplemental aid for at risk children and (b) larger adjustment for at risk children in larger districts. Further, when cost adjustments in SDF are taken as a whole, there is no overall positive relationship between district poverty shares, and cost adjusted first tier aid per pupil among large districts. That is, high poverty large districts get no more aid per pupil than low poverty large districts, despite significantly greater need.
Bilingual weight	Adjustments for English language learners or bilingual program weights should provide sufficient cost adjustment to theoretically achieve comparable outcomes with children with limited English proficiency. For example, should be large enough such that districts with high LEP or ELL shares in a metropolitan area receive substantially more Tier I aid per pupil than districts with low LEP shares toward achieving the same goals.	The bilingual programming weight of .20 per FTE pupil (receiving 6 contact hours of programming) was not based on any empirical analysis of the cost of bilingual education services, and is inconsistent with both empirical research on costs associated with specific outcomes, and inconsistent with findings of a study commissioned by the legislature (Augenblick and Myers). That study proposed both substantially higher weight for all districts and even greater weight in large districts.
New facilities weight	Cost adjustments to annual operating budgets for children in "new facilities" should not exist. It might be reasonable for the state to provide additional support for bond and interest payments to reduce the tax burdens of districts building several new facilities over a relatively short period of time.	The present new facilities weight is substantial enough in wealthy suburban districts to outweigh student need adjustments of poor urban districts, shifting teacher labor market advantages even more in favor of wealthy suburbs. Further, stipulations accompanying the weight were irrationally exclusive, providing the weight to primarily high income

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		communities.
Local Supplemental Second Tier(s)		
Local option budgets	Second Tier revenues or local option budgets should, as the word "option" suggests, be optional sources of supplemental revenue for enhancement of local revenues beyond adequate or suitable levels.	LOBs have been necessarily (not optionally) maximized by large districts trying to retain adequacy. LOBs were immediately necessary, not optional, in large districts from the outset of SDF.
LOB matching aid to improve neutrality	State matching aid for second tier revenues should include multiple measures of fiscal capacity and be matched a high level.	Local option budgets are matched only at the 75%ile of assessed valuation per pupil. No other capacity measures are included. The size of local option budgets remains highly associated with district median family income and the capacity to raise LOB revenues (as a percent of median family income) varies nearly 5X.
Capital outlay	It may be reasonable to create a mechanism by which districts can raise revenues to support purchase of "big ticket" items, especially where restrictions on "rollover" of funds exist for other revenue sources. If such a program exists, matching aid should be provided in a manner similar to that recommended for second tier operating revenues – adjusted for property wealth, income and other capacity measures.	Presently, there is no matching aid for capital outlay revenues. As a result, capital outlay revenues are highly associated with both income and tax price measures. The capacity to raise additional capital outlay dollars (as a percent of median family income) varies nearly 10X. That is, in some districts $1,000 per pupil in capital outlay revenue can be raised with slightly over 1/10 of 1% of median family income while in other districts it takes a full 1% of median family income.

Formula Component	Reasonable Mark	School District Finance and Quality Performance Accreditation Act
Economic development sales taxes	Economic development sales taxes should not be necessary because they create (a) inappropriate economic distortions[1] and (b) difficult to resolve inequities.[2]	Economic development taxes were necessary early on in Salina to offset excessive tax burden resulting from inadequate matching aid on local option budgets. Salina is among those districts where additional LOB dollars are particularly "expensive" with respect to median family income, making it difficult to pass an LOB. Were necessary in Johnson County to meet cost growth when tier I aid lagged, and official Tier II taxes reached their limit.
Private contributions	Should not be necessary	Playing a growing role in Kansas' larger districts trying to keep pace with cost increases
Accountability System		
Broad Framework	An accountability system should be designed to assist the legislature in insuring that each child will have the opportunity to attend a "suitable" school or district. Alternatively, an accountability system should be designed to assist the legislature in insuring that each individual child will have the opportunity to obtain a "suitable" level of knowledge and skills to be a productive citizen.	The present system, QPA, is based on the notion of providing each child the opportunity to attend an "accredited" thereby "suitable" school. Yet, in the present system, there is no statistically valid way to actually measure school quality or rate of improvement of school quality toward specific standards. Present standards like the standards of excellence merely measure the racial/demographic and socio-economic composition of schools. Further, continuous improvement is so broadly defined and poorly and

[1] Including incentives for counties/municipalities in collaboration with school districts to express preferences and/or provide incentives to retail businesses for economic development rather than manufacturing industries, leading to unintended labor market and/or economic development consequences for the state as whole.

[2] There is no logical way to equalize aid, or provide compensating matching aid with respect to estimates of "revenue generating capacity" of cities and/or counties choosing to adopt economic development taxes.

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		inconsistently measured as to allow several generations of children to pass through very low performing schools while waiting for those schools to become "suitable." Finally, all Kansas schools are accredited, despite vast disparities in performance and questionable patterns of "continuous improvement."
Student Performance Assessment	If student performance assessments are to be used as a basis for evaluating **school quality**, then student assessments should occur annually, and should be used to track individual students as they pass from year to year through grade levels in specific schools and districts. That is, student level value-added analysis must be used to isolate school and teacher effects on students learning.[3] Alternatively, if the objective of the accountability system is to guarantee to each individual child, a "suitable" level of knowledge and skills for productive participation in society, a "high stakes" exit exam is appropriate. That is, each child should be expected to pass a test based on specific knowledge and skill standards to obtain a diploma.	QPA and the present Kansas State Assessment system provide no feasible method for measuring schooling quality. The primary flaw is the inability to track any single student from one point in time to another. If you don't know where a child's performance was prior to entering a school, even if you do know their performance level at a later point, there is no way to discern the effect the school had on that child's learning. Further, there are no stakes (for children) attached to any testing in the state. As such, there is likely little or no motivation for a child to want to do well or care at all about their performance on state assessments. This reduces both the usefulness of the tests as a tool for evaluating student progress and the reliability of the tests as a tool for evaluating school quality.
Rewards and	If the goal is to insure that all children have the opportunity to attend a suitable school, then the state must	Again, all Kansas schools are accredited despite wide variations in performance outcomes and questionable

[3] While imperfect, student level value-added analysis is the most appropriate, and can be the most technically rigorous approach for measuring and ranking school quality. See J.R. Lockwood, Thomas A. Louis and Daniel F. McCaffrey (2002) Uncertainty in Rank Estimation: Implications for Value-Added Modeling Accountability Systems. *Journal of Educational and Behavioral Statistics* 27 (3) 255-270.

Formula Component	Reasonable Mark	School District Finance and Quality Performance Accreditation Act
Sanctions	be willing to set clear standards, based on objective measures regarding what constitutes "suitable" performance, and must be willing to follow through on (a) relieving schools of their accreditation status (before large numbers of students are "left behind") and (b) either providing students the option to attend school elsewhere (including charter or voucher options) or using aggressive intervention strategies possibly including reconstitution[4] and/or takeover to improve failing schools. If the goal is to insure that all children have the opportunity to obtain a specific set of knowledge and skills then high school exit exams should be used to insure that receiving a diploma in Kansas means that a child has passed a test of those knowledge and skills.	signs of "continuous improvement" among some of the states lowest performing districts. The state appears to lack the will to strip a school or district of accreditation. Further, even if they had the will, they lack a system of performance measurement that would allow them to make appropriate decisions regarding districts that should be stripped of accreditation. Again, there are no stakes attached to any state tests. Under the present system, a child could (and many likely do) fail every single statewide assessment they take while in public school in Kansas, and still receive a diploma from an "accredited" Kansas school.
Racial Disparities		
Disparities resulting from Tier I cost adjustments	Cost adjustments in school funding formulas are unlikely to be entirely race neutral. However, where significant racial disparities result (regardless of the population that is disadvantaged), such disparities should be carefully scrutinized in terms of both **concept** and **magnitude. Conceptually**, one must ask whether it is reasonable to assume that such a cost adjustment should exist at all (e.g. does it cost more in annual operating dollars to educate children in new facilities?). In terms of **magnitude**, empirical evidence must be carefully weighed to determine whether the size of the proposed adjustment is *"wide of a*	In the present school finance formula, there is at least one cost adjustment – new facilities weight – that fails the simple test of conceptual appropriateness. While economies of scale adjustments, and adjustments for at risk students and bilingual education programs are conceptually appropriate (that is, they should exist), the present economies of scale adjustment is wide of a reasonable mark in both shape and magnitude (too large), and the present weights for student needs are so small as to be wide of a reasonable mark. Collectively, the system of

[4] Where reconstitution should primarily involve dissolving all administrative and teacher contracts, and the rebuilding process should focus on the hiring of new, more highly qualified teachers than those who had produced the previous failing grades. Salary bonuses/wage differentials might be appropriate policies for recruiting highly qualified administrators and teachers into "reconstituted schools." Only some current teachers should be invited to reapply, based on a strong track record of student *value added* outcomes.

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	reasonable mark." Finally, the aggregate effects of cost adjustments must be scrutinized to discern not just whether individual adjustments are reasonable, but whether the overall balance of their effects is reasonable and empirically justifiable.	weights is substantially imbalanced (wide of a reasonable mark) toward favoring district needs, like new facilities and smallness, over student needs like economic deprivation and language difficulties. More appropriately designed policies result in substantial reduction of racially disparate effects.
Special Education Aid		
Allocation of supplemental/ categorical aid for children with special educational needs	An appropriately designed program of allocating aid to districts to meet the needs of children with disabilities should logically integrate general education funding with supplemental/categorical funding such that the combination of the two funding sources yields funding sufficient to meet the needs of individual students, regardless of the district they attend, or the type of placement.	The present system of allocating shares of personnel costs to meet the needs of children with disabilities is conceptually appropriate, but flawed in its application in two major ways: (a) In general, the state has failed to cover fully the excess costs associated with meeting the needs of children with disabilities, leading to further reduction of available general funds, which more severely affects general education programs in midsized to larger districts with fewer available general funds from which to draw and higher average special education costs per special education pupil; and (b) Special education aid continues to be poorly integrated with general fund aid, toward the above stated objective. Present and recent allocations of special education aid are significantly misaligned with estimates produced by Augenblick and Myers, especially for larger districts. A previous legislative post audit suggested similar problems. It is unlikely that special education aid can be adjusted in any logical way to compensate for the gross errors in general fund aid allocations.

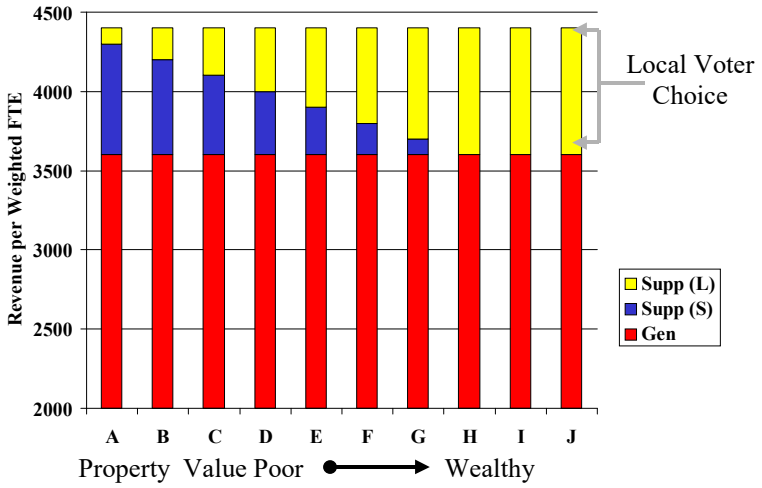
I. INTRODUCTION

A. The School District Finance Act: A "Cost Adjusted Two Tiered" Formula

The Kansas School District Finance Act, implemented in 1992 is a "cost adjusted two tiered" school finance formula. The basic structure of SDF includes a "Base State Aid per Weighted FTE Pupil," (first tier) originally set at $3,600 (per weighted FTE) and a local option to supplement that base aid (second tier), where the local supplement is partially property-wealth equalized by providing state aid on a sliding scale.

Figure 1 presents a schematic diagram of the basic formula, excluding cost adjustments (pupil weights). In Figure 1, ten school districts are organized from property poor to property wealthy from left to right. The "Base State Aid per Pupil," (BSAPP) or "General Fund Budget per Weighted Pupil" (GFBPP) is shown in red and is equal across all "weighted full time equivalent" (WFTE) pupils. The Base State Aid per Pupil is partially funded by a uniform statewide property tax of 20 mills (20/1000 or 2%). The yellow and blue portions of the graph combined represent the additional 25% revenues a district may legally raise in addition to their general fund budgets. This 25%, or second tier, is referred to as the "Local Option Budget" (LOB) or "Supplemental Fund Budget." For districts with assessed value less than that of the 75%ile district, state aid is provided on a sliding scale (shown in Blue), to assist those districts in raising LOB revenues.

Figure 1
Basic Conceptual Structure of the School District Finance Act



Bruce D. Baker, September 22, 2001

It is important to understand that Figure 1 presents General and Supplemental Fund revenues per "weighted FTE pupils." General fund allocations are completely equalized per "weighted pupil." "Weighted pupil" counts and/or pupil weighting systems are a device used for creating "cost-based" adjustments to each district's base state aid per pupil. The weighting system used in the School District Finance Act includes the adjustments listed in Table 1.

Table 1
Cost Adjustments in SDF

Adjustment	Weight/Application
District Factors	
Low Enrollment	Sliding scale factor multiplied by a total enrollment of district. Sliding scale is set at 114% (1.14 weight) for district enrolling 100 pupils, 58% (.58) for district enrolling 300 pupils, down to minimum (correlation weight) of 6.32% (.0632 weight).
Correlation (High Enrollment)	.0632 weight times total district enrollment for districts with greater than 1,725 pupils
Transportation	Sliding scale weight based on numbers of pupils living more than 2.5 miles from school and population density factor
New Facilities	.25 weight times total number of pupils in a new school facility for the first two years of operation of that facility. May only be accessed if LOB is at 25%.
Student Need Factors	
At Risk Pupils	.10 weight times number of students qualifying for National School Lunch Program – Free Lunch Category
Pupils in qualified Bilingual Education Programs	.20 times FTE pupils in bilingual education programs, where 1 FTE = 6 contact hours
Pupils in Vocational Education Programs	.50 times FTE pupils in vocational education programs, where 1 FTE = 6 contact hours

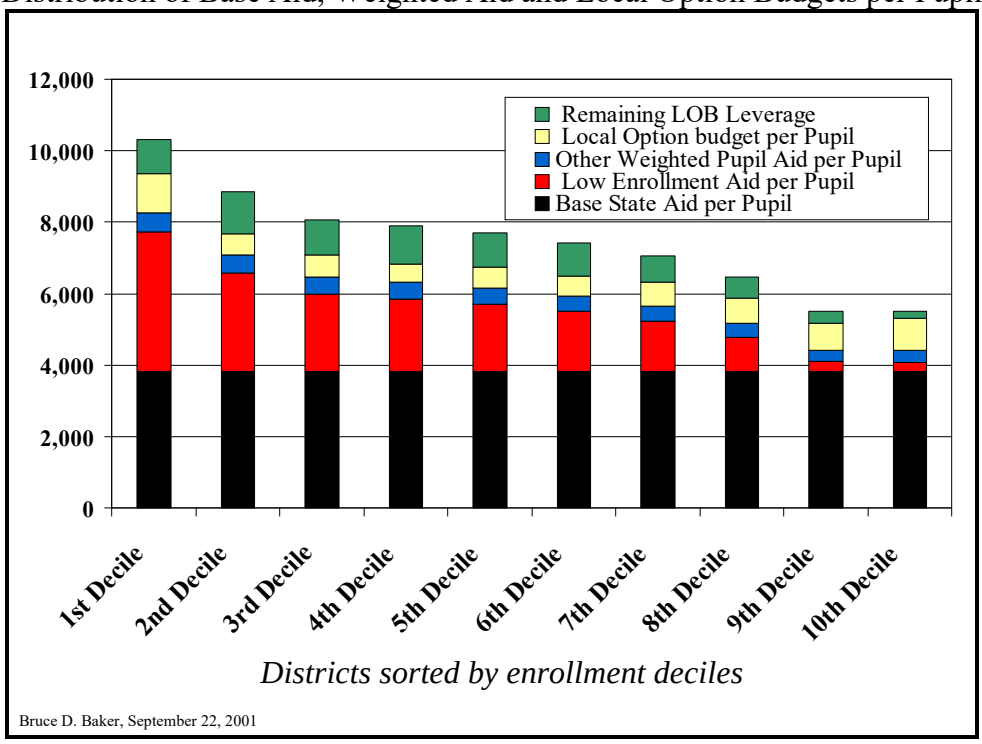
Note that this is only a brief summary, and more thorough documentation may be found at www.ksde.org. A handful of "less substantial" weights have been excluded from this table, including the "ancillary new facilities weight," and "early childhood at risk weight."

The aggregate effects of the pupil weighting system are displayed in Figure 2. In Figure 2 Kansas School Districts are organized by district size, in groups of roughly 30 districts each (304 districts in 10 groups). Note that over 50% of "actual" (not weighted) students in the state attend districts in the 10th enrollment decile – the largest districts in the state. In 2000 – 2001, Base State Aid per Weighted Pupil was set at $3,820. Low enrollment adjustments ranged from a high of 114% of base aid, to a low of 6.32% of base aid (correlation adjustment). The average low enrollment aid for the smallest 30 districts was $3,895 per pupil, more than doubling the total per pupil revenue for those districts. In larger districts, the correlation weight of 6.32% yielded approximately $242 per pupil. The blue portion of the bars in Figure 2 – Other Weighted Aid per Pupil – includes the per pupil effects of all other weighted aid. Note that the smaller districts receive slightly more "other weighted aid" per pupil than larger districts. As a ratio of total weighted general fund aid to base state aid per pupil, in 1999 - 2000, districts received anywhere from 1.07 (107%) to 2.32 (232%) of that year's base aid per pupil of $3,770.

An interesting feature of the revenue cap on local option budgets is that the 25% cap is calculated relative to the adjusted general fund budget. As such, a smaller district receiving general funds per pupil at $8,000 may raise an additional $2,000, while a larger district receiving general funds per pupil slightly in excess of $4,000 may raise only an additional $1,000. As base aid per pupil has grown only from $3,600 in 1992, to its present level of $3,863, and as the legislature has relaxed requirements on referenda for

local option budgets,[5] more and more districts have found it necessary to implement and/or maximize their use of the LOB. Note that this is especially the case in the largest districts. By 2001 – 2002, 37% of all students attending districts with greater than 1,725 pupils (those receiving no low enrollment weight), attended districts that had maximized their local option budgets at 25%, and 79% of students attending larger districts were in districts within 5% (above 20% LOB) of their local option budget limit.

Figure 2
Distribution of Base Aid, Weighted Aid and Local Option Budgets per Pupil



To put financial resources of Kansas school districts into national perspective, Table 2 presents current expenditures per pupil of Kansas districts, by enrollment groups, along side of the national averages of school districts (K-12 only) of the same size, using data from the U.S. Census Bureau's Fiscal Survey of Local Governments 1996 to 2000. Note that on average, Kansas districts are statistically significantly below the national average. Kansas districts with 100 to 1,000 students spend significantly more than their counterparts elsewhere, while Kansas districts with 1,000 to 10,000 pupils spend less per pupil.

[5] Allowing for example, districts with per pupil revenues below the average for their enrollment group to raise their LOB to the average without a referenda.

Table 2
Kansas and U.S. Average (excluding Kansas) Current Operating Expenditures per Pupil by District Enrollment (five year average from 1996 - 2000)

Enrollment Group	Kansas	All Other States	Kansas Relative to Other States		% Difference
All Districts	$5,798	$6,086	-$289	***	-4.7%
<100	$10,236	$10,780	-$544		-5.0%
100 to 299	$7,657	$7,027	+$629	***	9.0%
300 to 999	$6,235	$6,000	+$235	***	3.9%
1000 to 1725	$5,611	$6,031	-$420	***	-7.0%
1726 to 10000	$5,326	$6,244	-$918	***	-14.7%
>10000	$5,977	$5,978	$1		0.0%

***p<.01 (indicating that the mean of Kansas districts and the mean of districts in other states are statistically significantly different, based on t-test of means)
Data Source: Annual Financial Survey of Local Governments (F-33) 1996 - 2000. U.S. Census Bureau. www.census.gov. K-12 districts only.

The bottom line is that revenues and expenditures per pupil are far from equal across Kansas school districts. Unlike many states, however, and unlike most school finance disparities challenged in court in the 1970s and 1980s, the differences in funding across Kansas districts are a direct function of state policies designed to distribute aid unequally, and restrict district resources per pupil unequally (LOB cap). Indeed a system of school finance that has dramatic differences in funding created by state policy can be rational, but only to the extent that individual "cost adjustments," and/or the collective effects of all cost adjustments are reasonably related to differences in costs across districts. That is, such a system can be rational if differences in funding created by the complete package of cost adjustments can be supported by a "rational educational explanation."

B. Rationale & Design of "Cost Adjusted Two Tiered" Formulas in an Era of Standards and Accountability

In this section, I provide an overview of how one would go about designing an empirically sound and educationally rational "cost adjusted two tiered" school finance formula, linked with standards and accountability and supported by an equitable tax policy. Examples used in this section are hypothetical, but based on recent analyses of Texas school districts performed by researchers affiliated with the Charles A. Dana Center of the University of Texas at Austin for the 77th Legislature. Hypothetical districts in the examples that follow are based on average characteristics of Texas school districts organized into poverty and locale classifications.

The General Framework

Caroline M. Hoxby of Harvard University describes a reasonable framework for a school finance formula as follows:

> "(1) Redistribution among districts in the form of state aid financed by an income or sales tax that supports a per-pupil spending floor (that might vary with district characteristics that are known to affect the cost of schooling) and (2) Local property tax finance for any spending beyond the spending floor."[6]

What Hoxby describes could be interpreted as a "two tiered" formula, with a cost adjusted first tier. The first tier consists of some mechanism for collecting revenues statewide, then distributing block grants out to local school districts, adjusted in some way to reflect cost differences. The second tier consists of some mechanism for allowing voters in local school districts to tax local property to "enhance" the quality of their local schools.

The Revenue Side of the Equation

I include this section on revenues for a handful of reasons. First, it is my perception that a major underlying cause of the problems discussed primarily in Section II of this report, in which I chronicle the *Collapse of the School District Finance Act,* has been poor tax policy decisions by the Kansas legislature. Second, as part of Section II of this report, I discuss persisting problems with tax equity as relate to emerging use of additional local tax sources for supplementing inadequate and inappropriately distributed Tier I revenues. Finally, and most importantly, I include this section as it offers some potential solutions for the future of Kansas' school finance.

It is not trivial that Hoxby chooses to inextricably link the revenue side and distribution side of the school finance equation. That is, that Hoxby has chosen to recommend a statewide tax base (e.g. income or sales taxes) for supporting the first tier, and local property taxation for supporting the second tier. The distribution objective of the first tier might be identified as either an equity objective or adequacy objective, or in

[6] Caroline M. Hoxby (1998) All School Finance Equalizations are Not Created Equal. Working Paper. Department of Economics, Harvard University & National Bureau of Economic Research.

some regards, both. That is, the distribution goal of the first tier is to achieve some level of basic statewide service for all children, perhaps as defined broadly in a state's constitution (as *suitable, thorough and efficient* etc.). Statewide taxes, like income and sales taxes, are appropriate for meeting statewide redistribution goals.

The second tier of a two tiered formula has multiple, interconnected objectives. While leading to enhancement of local schooling quality, the second tier is also intended to increase local involvement in schools. The second tier is based on local property taxation because local voters, including those without children in the schools, may benefit from improved quality of local public services. In particular, property owners benefit in the form of increased residential property values. That is, housing prices increase where schooling quality is perceived to be higher. [7] Further, local voters preferring lower taxes and caring less about schooling quality may choose to vote with their feet by moving to a community with preferences more similar to their own regarding the price they are willing to pay for specific benefits, including service quality and capitalization of housing value. As such, local property taxation is an appropriate mechanism for the second tier.

There are a few cautions worth noting regarding the local capitalization and related arguments favoring local property taxation for funding public schools. Much of Hoxby's work in this area is based on theories developed by Charles Tiebout (1956).[8] Tiebout explains how families and individuals will sort themselves (vote with their feet) among school districts based on their preferences for different levels of schooling quality and preference to improve the value of their own property via spending on local public services. Sorting of this type should lead to what economists refer to as "allocative efficiency," or each person living in a house of a value they desire, with schooling quality at a level they desire, and tax rates they find acceptable. In other words, a point can be reached at which no two individuals can swap goods (school districts) without making someone worse off.

Theoretical work in economics typically assumes away or even sugarcoats (by way of abstraction) morally or socially objectionable realities that may be associated with achieving ideal conditions like "allocative efficiency" in public education. First, mobility itself has costs, so not everyone has equal opportunity to residentially sort, or "vote with their feet." Second, information on schooling quality and access to that information (ability to adequately interpret that information) varies by socio-economic status. Third, established housing patterns are such that not everyone has the ability (such as the personal financial capacity) to buy a house anywhere they want. Finally, and perhaps most importantly, it is the children who benefit or not, as a function of the quality of local public schools and children have little control over their parents' residential mobility.

Assuming limited mobility, and uneven distribution voting populations with school aged children, many children, unable to move, will be subjected to a quality of education determined by a voting population (a) with no direct interest in schools and (b) little understanding of the capitalization effects of school spending and quality. Further,

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[7] For recent literature in this area, see David N. Figlio (2000) What's in a Grade? School Report Cards and House Prices. Working Paper No. 8019. National Bureau of Economic Research http://www.nber.org/papers/w8019. Thomas Downes and Jeffrey Zabel (1997) The Impact of School Characteristics on House Prices: Chicago 1987 – 1991. Working paper. Department of Economics, Tufts University.

[8] Charles M. Tiebout (1956) A Pure Theory of Local Expenditures. Journal of Political Economy 64 (October) 416-424.

even where voters do understand capitalization, they (especially lower income voters) may have greater preference for low tax bills in the short run than high sale price in the long run. That is, in reality, unregulated Tiebout processes are likely to lead to poor children living in poor neighborhoods with bad schools, and wealthy children, living in wealthy neighborhoods with good schools.[9] Assuming that poor children's parents, on average, have lower preferences for school quality (as measured by voting behavior, likely correlated with their own lower levels of education), one could argue that this result yields *allocative efficiency,* but it is certainly not *equitable.* Hence the need for an equitably distributed and adequately funded first tier in school finance formulas.

Ideally, a well funded, appropriately distributed first tier resolves most basic equity and adequacy issues that might be *eroded* by the second tier. With the condition of state budgets following the recent economic downturn, there is increased concern regarding the appropriateness of relying too heavily on typical state level tax bases (income and sales) as the primary or sole support for the critically important first tier.[10] That is, it can be quite difficult to maintain a well funded first tier with a tax base that is highly responsive to economic conditions, and as a result, in bad economic times grows more slowly than the cost of funding the first tier.

In our personal finances we are constantly reminded to maintain a *balanced* portfolio.[11] As early as the 1970s, economists were offering solutions for providing a more balanced portfolio of state revenues for funding public education. In 1975, Helen Ladd, for example, argued for statewide taxation of non-residential property values and in the 1990s, Brian Brent simulated the equity advantages of regional, within state, taxation of non-residential property in New York. Property values, including non-residential properties are significantly less responsive to economic conditions than income (especially where larger shares of income are in the form of investment returns), and consumption of taxable goods.

An important feature of taxation of non-residential property for supporting the first tier of a school finance formula is that it does not intrude on the previously stated objectives of the second tier. Non-residential properties, like industrial complexes, commercial real estate, utilities or oil or natural gas deposits do not retain value (as a property), or increase in value solely in response to local demand for their product (in general). As such, why should that property be taxable (for school funding purposes) only to the residents of the community in which that property happens to be located (especially in the case of geographic circumstance resources, like natural gas and oil)? Just as benefits of non-residential properties are spread out by statewide taxation, so too is the pain associated with rapid and dramatic loss in property values that may accompany an industrial plant closure, or nuclear power facility going permanently off line.

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[9] See for example, J.M. Poterba (1997) Demographic structure and the political economy of public education, Journal of Policy Analysis and Management 16 (1) 48-66. Amy Harris, William Evans, Robert Schwab (1999) Education Spending in an Aging America. Working Paper. Department of Economics, University of Maryland, College Park. Edward M. Gramlich and Daniel Rubinfeld (1982) Micro Estimates of Public Spending Demand Functions and Tests of the Tiebout and Median-Voter Hypotheses. Journal of Political Economy 90 (3) 536-560

[10] At the 2002 Kansas Economic Policy Conference, in his keynote address, Robert Tannenwald, public finance specialist of the Federal Reserve Bank of Boston discussed, in particular, the sensitivity of state revenues to personal income taxes as a potential major underlying source of state budget shortfalls in the recent economic downturn. See http://www.ku.edu/pri/conferen/Tannenwald.ppt

[11] except perhaps through the late 1990s, when individuals were encouraged to pour everything into stocks

In addition to balancing the portfolio of revenues for the first tier, separating non-residential property taxes from residential property taxes, and using residential property taxes for the second tier accomplishes two additional objectives. First, taxing only residential properties for the second tier creates and even tighter linkage between local voter preferences, schooling quality, and housing values. Second, non-residential properties are often a source of idiosyncratic inequities in tax effort and yield across local public school districts. For example, in Kansas, the ratio of the 95%ile to 5%ile median housing unit value (by district) is 3.64 to 1, while the ratio of the 95%ile to the %5ile total assessed value per pupil (including non-residential properties) is 6.18 to 1.

First Tier Allocation Objectives: Getting Children to the Same Starting Line

Figure 3 presents an overview of design considerations for a "cost adjusted" first tier of a school finance formula, including both expenditure and revenue decisions. In an era of standards and accountability, one might argue that the central objective of the "cost adjusted first tier" should be to provide children of varied needs, attending schools under varied circumstances, comparable opportunity to achieve a given set of outcomes.[12] Consider it an *outcome starting line,* with the goal of the first tier to get all children to the same starting line. Note that this objective is a conceptual basis for estimating appropriate first tier funding levels, and not a practical policy objective. As a practical policy objective, getting kids to the same starting line would require significant *leveling down* of outcomes for high achieving children and children with access to learning opportunities outside of their public schooling.

One approach for estimating relative costs that has been used in consultation with the Texas legislature, though not yet applied in policy, is the *education cost function.* The discussion and examples that follow in this section are based in part on the cost function analysis of Texas school districts produced for the 77th Texas legislature.[13] In short, cost functions are a regression-based statistical method for estimating the relative cost of achieving a given set of outcomes, with a given mix of students, under varied conditions.

When conducting this type of cost analysis, it is a value judgment of state policy makers (with reference to existing legislation and state constitutional wording) as to which outcomes (types, measures and levels) are perceived as important. For example, policymakers might determine that an adequate education is one in which students who participate in public schooling are provided the opportunity to achieve comparable annual gains. Some might object to this standard on the basis that it does not insure a specific level of proficiency expected of students upon exiting the public system. In response to

[12] Note at the present time, that it is highly questionable whether the Kansas legislature and board of education have a preference for an outcome based standard. First, as discussed in a later section of this report, the legislature and board of education appear to have adopted an input based standard. In addition, recent research classifying the strength of state accountability systems classifies the Kansas system as "weak." See Martin Carnoy and Susanna Loeb (2002) Does External Accountability Affect Student Outcomes? A Cross-state Analysis. *Educational Evaluation and Policy Analysis* 24 (2) 305-332.

[13] Celeste Alexander, Timothy Gronberg, Dennis Jansen, Harrison Keller, Lori Taylor and Philip Triesman (2000) A Study of Uncontrollable Variations in the Costs of Texas Public Education: A summary report prepared for the 77th Texas Legislature. Charles A. Dana Center. University of Texas at Austin.

this concern, specific levels of proficiency might be defined and used either as an alternative to, or in conjunction with, expected gains. It may also be the judgment of state policymakers that defining specific outcomes is irrelevant, and that adequacy should be defined in terms of a specific set of educational inputs or resources. This is the present case in Kansas. Regardless, these are the complex conversations and difficult decisions that must precede estimation of the relative costs of achieving outcomes.

The central outcome measure underlying the Texas cost index used in the examples in this section was the individual student gain scores on the Texas Assessment of Academic Skills (TAAS). That is, the researchers adopted a *value-added* metric, implying that the objective was to measure the relative costs of achieving comparable yearly gains in student achievement, across different students, under different circumstances.[14] Other outcomes in the model include percentages of student scoring above a critical level on SAT/ACT tests, and percentages of children passing an advanced course.

It is conceivable that the use of a value-added outcome measure as the central outcome actually reduces the relative cost of educating at risk and limited English proficient children. Empirical analyses typically suggest that differences in average gains of low vs. high income children tend to be smaller than differences in performance levels. As such, one might expect the relative cost of closing the "achievement gain gap" to be smaller than the relative cost of closing the "achievement level gap." I note this distinction because the cost index used in the following examples appears to have a smaller "poverty" effect than cost indices of other researchers, using data on both Texas and other states and defined performance levels (e.g. percent passing a specific standard) as outcomes.[15]

Note that Figure 3 also includes decisions regarding revenue generation for the First tier. At present, there is no strong empirical evidence (of which I am aware) regarding the "best mix" or best portfolio balance of state revenues for adequately supporting growth in education costs through good and bad economic times. As such, noted percentages in Figure 3 remain speculative until such empirical evidence can be generated. The point remains that states must be cognizant of retaining a portfolio of balanced revenue sources for funding the critically important first tier.

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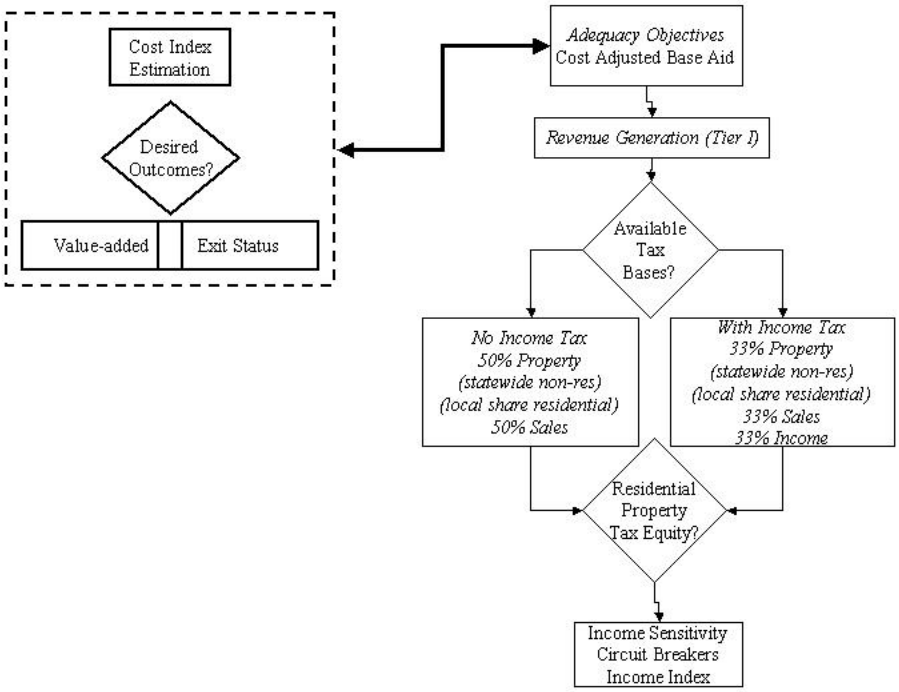
[14] As will be discussed later, a similar metric is presently infeasible in Kansas, given the design of the state assessment system. It is questionable whether this technical shortcoming of the Kansas assessments is an expression of legislative and state board preferences for outcomes, or a function of the preferences of the test developers (who function as agents of the state).

[15] William Duncombe & 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. Andrew Reschovsky and Jennifer Imazeki, "The development of school finance formulas to guarantee the provision of adequate education to low income students," in W. Fowler (Ed.) *Developments in School Finance 1997* (Washington, DC: National Center for Education Statistics, 1998), 121-148. Andrew Reschovsky & Jennifer Imazeki. "Achieving Educational Adequacy through School Finance Reform," *Journal of Education Finance*. 26 (2001): 373-396.

Figure 3
Designing a "Cost Adjusted First Tier"



Source: Forthcoming in Baker, Richards and Green. Financing Education Systems.

Table 3 presents 27 hypothetical school districts used for modeling a cost adjusted first tier of a funding formula. The 27 districts represent the average characteristics of Texas school districts by locale (according to the U.S. Census bureau classification) and by poverty quartile, using Census 2000 data on the percent of children between 5 and 17 living in poverty. The CFI is the cost function index (average for districts in a group) from the study performed for the 77th Legislature. Essentially, the CFIs below represent the relative cost of achieving comparable annual value added, across districts serving different mixes of students, under varied circumstances. Student characteristics include shares of students with disabilities, shares of at risk and limited English proficient students and shares of students in high school. District characteristics (beyond control of local administrators) include district size, and other factors that may influence the price the district must pay for educational resources such as teachers.

In this example, the Cost Function Index is centered around the median value. Districts with a cost index above 1.0 have higher costs than median costs, and districts with a cost index below 1.0 have lower costs. If, for example, we estimate that it takes the median district $5,000 per pupil to achieve median outcomes, it would take a district with a cost function index of 1.20 approximately $6,000 per pupil to achieve similar outcomes.[16]

[16] Note that the CFI was estimated not with Census measures of poverty and language proficiency status, but with local district reports of children served. Note also, that the CFI also includes adjustment for students with disabilities.

Table 3
Sample District Characteristics and Cost Indices Based on Texas Data

Group	Locale	Poverty	Refined Average Daily Attendance	Percent Disable	Percent Poverty	Percent ELL	Cost Index (CFI)
1	Large Central City	High	60,324	7.31%	25.34%	6.74%	1.00
2	Large Central City	Low	51,625	7.31%	16.15%	3.17%	0.95
3	Large Central City	Very High	121,686	7.43%	40.91%	8.73%	1.07
4	Large Central City	Very Low	12,001	6.06%	5.86%	1.36%	0.89
5	Large Town	High	7,284	10.18%	25.91%	1.88%	0.95
6	Large Town	Low	5,384	7.10%	17.63%	2.14%	0.93
7	Large Town	Very High	6,624	8.70%	50.65%	5.74%	1.01
8	Mid-size Central City	High	17,069	8.36%	25.39%	2.61%	1.00
9	Mid-size Central City	Low	17,693	7.46%	16.87%	3.28%	0.95
10	Mid-size Central City	Very High	20,171	7.36%	57.86%	7.87%	1.04
11	Mid-size Central City	Very Low	1,782	6.17%	5.63%	0.63%	0.91
12	Rural	High	933	7.81%	24.81%	1.46%	1.11
13	Rural	Low	864	7.26%	17.12%	1.15%	1.09
14	Rural	Very High	1,522	7.39%	49.47%	4.99%	1.20
15	Rural	Very Low	650	6.19%	9.11%	0.91%	1.12
16	Small Town	High	2,549	7.18%	26.00%	2.28%	1.01
17	Small Town	Low	2,462	6.52%	16.89%	1.20%	0.94
18	Small Town	Very High	3,484	6.10%	47.60%	4.36%	1.05
19	Small Town	Very Low	2,378	6.62%	11.25%	1.87%	0.96
20	Urban Fringe of Mid-size City	High	1,438	8.31%	26.29%	0.84%	1.11
21	Urban Fringe of Mid-size City	Low	3,063	8.28%	17.13%	1.07%	1.00
25	Urban Fringe of Mid-size City	Very High	12,311	6.41%	82.13%	10.04%	1.06
22	Urban Fringe of Mid-size City	Very Low	4,224	7.29%	8.16%	0.67%	0.91
23	Urban Fringe of Large City	High	25,692	7.23%	26.03%	5.24%	1.02
24	Urban Fringe of Large City	Low	8,323	8.14%	17.20%	2.54%	0.96
26	Urban Fringe of Large City	Very High	3,456	6.81%	61.83%	8.57%	1.12
27	Urban Fringe of Large City	Very Low	29,237	5.73%	7.83%	1.92%	0.88

Source: Draft of Chapter 9 Simulation. Craig E. Richards, Bruce D. Baker, Preston C. Green. *Financing Education Systems.* Forthcoming, Merrill/Prentice-Hall

Table 4 presents a hypothetical simulation output of cost adjusted base aid per pupil, based on the district characteristics and cost indices in Table 3. A variety of additional hypothetical conditions are also included for estimating each district's base aid, such as the assumed cost of achieving average outcomes in the average district, and assumed average efficiency of school districts. As such, the *levels* of aid in Table 4 are not necessarily meaningful, but the relative amounts of aid are. Note, for example, that an economies of scale component exists, whereby small rural districts receive higher aid per pupil. Poverty effects, however, are also quite strong, such that a very high poverty urban or urban fringe district receives nearly as much as a lower poverty rural district. That is, poverty effects are also quite strong, and in this example, nearly as strong as locale effects, on average.

Table 4
Sample Base Aid per Pupil, Adjusted for Costs by Locale and Poverty, Based on Texas Data

Locale	Poverty				Average
	Very High	High	Low	Very Low	
Large Central City	$6,711	$6,300	$5,981	$5,603	**$6,149**
Large Town	$6,377	$5,960	$5,847		**$6,061**
Mid-size Central City	$6,580	$6,271	$5,981	$5,704	**$6,134**
Rural	$7,556	$6,994	$6,877	$7,072	**$7,125**
Small Town	$6,645	$6,336	$5,952	$6,025	**$6,240**
Urban Fringe of Mid-size City	$6,690	$6,992	$6,283	$5,729	**$6,424**
Urban Fringe of Large City	$7,062	$6,418	$6,020	$5,515	**$6,253**
Average	**$6,803**	**$6,467**	**$6,134**	**$5,941**	**$6,351**

Source: Draft of Chapter 9 Simulation. Craig E. Richards, Bruce D. Baker, Preston C. Green. *Financing Education Systems.* Forthcoming, Merrill/Prentice-Hall

The Second Tier & Related Policy Options

Figure 4 extends the decision framework presented in Figure 3 to the second tier and related policy options. In general, the second tier is associated with various *efficiency* objectives. As noted previously, what economists refer to as *allocative efficiency* is one such objective, and one that may be achieved by exploiting *Tiebout* processes. That is, some allocative efficiency can be achieved by allowing local voters to pass referenda to enhance the budgets and ultimately the service quality of their local public schools.

When policymakers choose the local supplement path, they must also consider how to design a formula by which the state may provide matching aid to local districts to reduce the extent that additional tax revenues are related to voter's ability to raise additional local tax revenues. That is, to improve (though not mandate) fiscal neutrality. Conventional methods include providing a guaranteed tax base, or guaranteed yield that may be achieved by any district imposing a tax rate of X%. Presently, as noted in the first section of this report, Kansas provides each district the opportunity to raise local option (second tier) revenues at the level of the 75%ile property wealth district. In general, equalization, or matching aid formulas that account only for differences in property values, and not for differences in income and/or other factors, fail to *neutralize* the effects of ability to pay on local school revenues.

One option for improving neutrality is to include an income adjustment factor to matching aid. Connecticut and Missouri are two states that use such factors. Assume for example that two districts have the same property wealth per pupil, and thus, would receive the same aid per pupil at a given tax rate under a traditional property wealth equalized system. Assume in each case that for a 1% local tax, the local yield is 50 cents and the state matching aid is 50 cents. Assume that one district has median family income equal to the state median, but the other district has median family income only 80% of the state median. It will likely be more difficult to pass a 1% tax in the lower income district. An income adjustment might be used to provide the lower income district with 62.5 cents in matching aid (1.0/0.8 = 1.25 x 50 = 62.5) for every 50 cents raised locally. As such, a 1% tax rate in the lower income district would yield a total of $1.13, or more likely, provide the opportunity to take the additional 12.5 cents as tax relief.

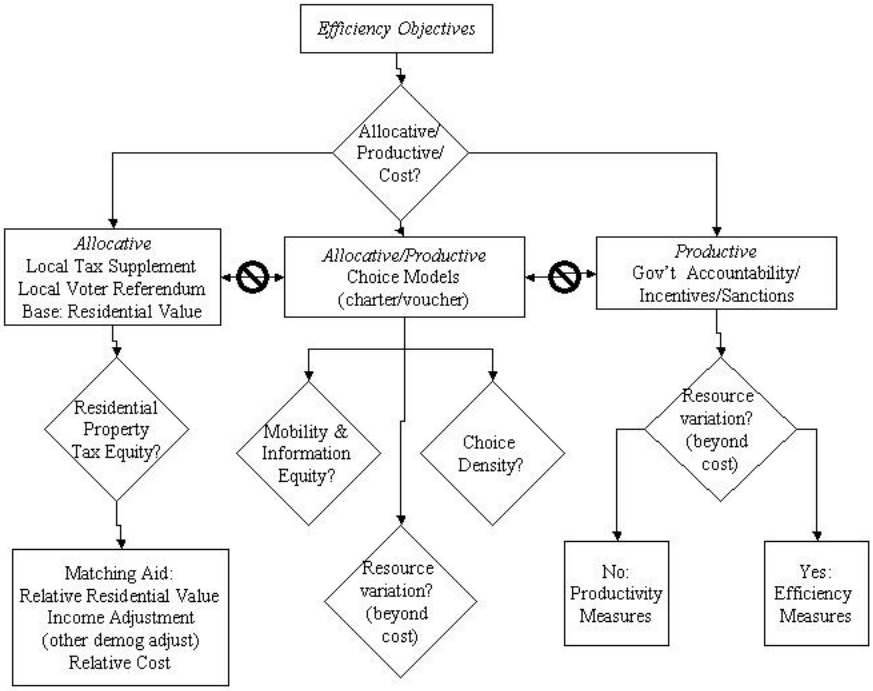
Tennessee goes a few steps further than a simple income index, including the following variables in a regression equation for estimating a fiscal capacity index: (a) Total taxable sales and equalized assessed property values; (b) Per capita income; (c) Ratio of residential and farm property assessment to total property assessment; (d) Ratio of average daily membership of students in public schools to total population. Vermont recently adopted an approach of limiting the percent of one's income that could be paid in annual property taxes.

An additional option is to adjust matching aid for the value of the dollar raised by local taxes. That is, if a district has a cost index of 1.20 and is able to raise $1 in revenues at a given tax rate, the state might provide 20cents additional aid to the district because it costs $1.20 in that district to purchase the same level of service as $1 would purchase in the average district.

In 1998 – 99, 24 states relied on local assessed property value per pupil alone as the basis for equalizing state aid. Ten states (CT, IA, ME, MD, MA, NH, NJ, NY, OH, PA) included personal income along with assessed valuation per pupil, four states (VA, TN, KY, NE) used assessed valuation, personal income and other revenue sources, and eight states used assessed valuation and other revenue sources.[17]

[17] See www.nces.ed.gov/edfin

Figure 4
Designing the Second Tier



Source: Forthcoming in Baker, Richards and Green. Financing Education Systems.

Figure 4 also addresses choice models and accountability systems, each of which presently has limited relevance to the Kansas policy context. Kansas allows public school choice, but does not require that districts accept non-resident students. As such, public school choice is not presently a legitimate, broad-based option for Kansas residents. In addition, transportation is not required to be fully publicly funded, if choices were broadly available. Further, much of Kansas lacks sufficient density of choices for even public school choice to be a feasible option.

The Ø symbol indicates a potential conceptual conflict between pursuing allocative efficiency by exploiting *Tiebout* processes and pursuing allocative and productive efficiency by promoting choice programs. Recent empirical research suggests that where choices exist, reducing alignment of residential location and schooling quality, that capitalization in home values is reduced. That is, property values may decline (or not grow as quickly) in neighborhoods with "good schools" if children from other neighborhoods may attend, and property values in those other neighborhoods may increase. Some policymakers may find this equalizing effect desirable. Nonetheless, it conflicts with the capitalization objectives of retaining local property taxes.

The final branch of Figure 4 involves methods for setting standards, evaluating schools and districts, and providing performance based awards and/or imposing sanctions. Several states now provide fiscal incentives to local schools or districts based on their performance on state assessments. One might make the analogy between these systems, and an athletic competition. In an athletic competition, there are typically strict standards for the type of equipment that can be used, such as the size of a tennis racket, type of shoes that may be worn, restrictions on performance enhancing drugs, lotteries

and drafts for distributing new talent across teams, and expenditure/salary caps as in professional football. Each of these restrictions is imposed to make the playing field as level as possible. Major League Baseball is a notable exception, allowing substantial revenue disparities among large and small market teams to persist, significantly influencing the player labor market and resulting balance of talent across small and large market teams.

The need to level the competitive playing field raises the question of how states can appropriately, simultaneously (a) allow for local enhancement of school budgets and (b) directly compare the performance across local districts. On the one hand, assuming that ability to raise additional revenues is sufficiently equalized (by taxable wealth, income and relative value of a dollar of revenue), direct performance comparisons might serve as an incentive to local voters to "step up," and provide their team the opportunity to compete for fiscal incentives. However, it is likely that the state, even with the types of accommodations previously addressed (income adjustments etc.), will be unable to fully equalize local communities ability to supplement school aid. As a result state should evaluate districts not on performance outcomes alone, but on performance outcomes given spending inputs. The state should evaluate, and reward on the basis of efficiency and not just raw productivity. If a district chooses to spend more (beyond it's basic cost of achieving state specified outcomes), the district should be expected to produce more.

Note that controlling differences in student population characteristics and/or other circumstances is equally if not more important as controlling for available resources. Unless both students and teachers can be randomly sorted, and schools assigned comparable revenue, then performance comparisons (especially when competitive) should be based on the output produced, given the dollars spent, the mix of students, and conditions under which those student are being educated (school size etc.).

Finally, another conceptual conflict emerges between choice models and state accountability systems. Original proponents of choice models as *market based* reforms argued that such reforms would improve overall education quality (productivity) because parents as consumers would choose to send their children to the "better" schools, and those schools would thrive. Eventually the "bad" schools would find themselves without students, and in turn without revenues, forced to close their doors. That is, parents as consumers would be the primary evaluators of schooling quality. Under such a model, it makes little sense to also provide fiscal incentives for meeting state imposed standards or impose sanctions on substandard districts, which should simply fail on the market. It may be reasonable to retain basic health/safety compliance-type standards. A state may, however, choose to develop an assessment/ evaluation system in order to improve the quality of information available to inform consumers'/parents' decisions.

Managing Disparities that Result from the Local Voter Choices on the Second Tier

Assuming that a legislature has taken appropriate steps to compensate for districts varied fiscal capacity with second tier state matching aid, revenues raised above and beyond the "suitable" or "adequate" first tier should reflect primarily the educational preferences of communities for *super-suitable*, or "excellent" education. That is, spending differences will emerge across districts, based primarily on the different

preferences for schooling quality of voters across districts. Under some circumstances, disparities may grow wide enough to raise equity concerns, because children are subjected to education resource differences that are a function of the behavior of local voters. The children themselves have little say in the matter. Further, only a percentage of the voters are parents of those children. In part, these spending differences raise equity concerns because they are not rationally related to educational costs (of providing comparable services). Rather, they are rationally related to providing different quality services, as desired by local voters. Inhibiting local voters from expressing their preference for "excellent" schools, however, is not a rational solution.[18] Rather, it's a lazy and inexpensive solution that will likely lead to all children "wallowing in a pond of mediocrity."

Growth in local spending over time which results from local voters' desires to improve or simply maintain schooling quality by keeping pace with costs, via direct local budget referenda, may better reflect growth in the costs of "excellence" or "adequacy" than spending decisions made by state legislators in the political context of state budget deliberations. For example, when local voters choose spending levels, thus tax rates, they need not fear political retribution for tax increases, reducing potential distortion in their price setting for public education. As a result, they may focus more clearly on the price they are willing to pay for services of a particular quality.

The preferences of communities desiring "excellent" schools should be viewed as a target for the legislature for adjusting the statewide "suitable" spending level in the short term. While excellent and adequate are different, as the cost of excellence increases, so too does the cost of adequacy and likely at a similar rate. As such, the legislature's objective should be, in the short term, to chase the moving "excellence" target, maintaining adequacy within a defined range below the "excellence" target via infusion of additional state aid into the cost adjusted first tier.[19] It can be expected that during bad economic times, when sales and income tax revenues lag, but property values do not, that the equity gap will increase. During good economic times, however, the legislature must take appropriate steps to *narrow the gap between adequacy and excellence*. The result should be an oscillating pattern, that in the long run, has adequacy (the cost adjusted first tier) maintaining its ground with excellence (high spending on the second tier). **The court may choose to set parameters for the acceptable range of oscillation.** Periodically, the legislature must revisit the question of desired outcomes, and re-estimate the cost of achieving those outcomes to be used as the basis of first tier funding.

C. Preview of the Shortcomings of SDF as a "Cost Adjusted Two Tiered Formula"

While it might appear on the surface that the Kansas School District Finance and Quality Performance Accreditation Act presents a reasonable attempt at a "cost adjusted two tiered" funding formula as laid out in this section, the remainder of this report points

[18] At the very least, tax limits on local revenues have proven not to be an empirically sound solution for keeping pace with increased education costs.

[19] For a thorough discussion of the dynamics of chasing the moving target, See Bruce D. Baker and Craig E. Richards (2002) Exploratory Application of System Dynamics Modeling to School Finance Policy Analysis. *Journal of Education Finance* 27 (3) 857-884.

out major deficiencies in the current policy with respect to these ideals. Here, I provide a brief preview of some of those deficiencies.

Major shortcomings of the first tier of SDF can be summarized as follows:

- Individually, the various *cost adjustments* in SDF for district related needs like (a) economies of scale (b) transportation and (c) new facilities and student related needs like (a) at risk children and (b) limited English proficient children, are completely arbitrary and not based on any sound empirical evidence.
- Collectively, the cost adjustments on the first tier of SDF produce illogical results, dramatically favoring *district needs* over *student needs*, providing, for example, more cumulative aid to wealthy suburban districts in the Kansas City metropolitan area for serving children in new facilities, than to poor urban districts with high concentrations of children in poverty and children with limited English proficiency.
- Overall, the first tier has been significantly under-funded from 1992 to present, having the greatest adverse effects on (a) larger districts not receiving low enrollment aid, and especially (b) larger districts with greater, and increasing student need related costs, including but not limited to larger urban districts like Kansas City, Wichita and Topeka, and large towns with diverse student populations like Garden City, Dodge City and Emporia.
- The present "cost adjusted first tier" is not tied in any logical way to the state's accountability system, nor can it be, due to serious flaws in the way in which student performance is measured.

Deficiencies in the additional tiers of the school district finance act may be summarized as follows:

- With strict tax limits on local option budgets and significant under-funding of the first tier, a hodgepodge of additional local discretionary tiers, including expansion of capital outlay budgets and wider discretion over use of capital outlay funds, addition of county and local sales tax revenues and increased private fundraising have emerged, in some cases, exceeding 50% supplements of general fund aid.
- Local revenues raised via local option budgets are insufficiently matched with state aid and sensitive to only one indicator of local capacity – assessed valuation per pupil. As such, local option revenues remain statistically associated with median family income and other demographic measures. For example, communities with higher median family income, and fewer voters over the age of 65 tend to have higher local option budgets per pupil.
- Additional, unofficial tiers are not at all equalized for local fiscal capacity. As such, they tend to be strongly associated with median family income and demographics, including the percent of the voter population over the age of 65.

The framework and hypothetical example laid out in this section set a new and admittedly high standard for the desirable level of rationality, technical and conceptual internal consistency and supporting empirical evidence that should ideally exist in state

school finance formulas. I offer these frameworks and examples to help guide Kansas toward more logical and appropriate, less political, less divisive and less discriminatory solutions. While these standards are high, I consider them a "reasonable mark" of what can and should exist in Kansas school finance policy. In this report, I will empirically validate that the present school district finance act is significantly wide of this "reasonable mark" as well as the "reasonable mark" established by the legislature and state board of education themselves. Further, I will show how the Kansas school district finance act, while significantly problematic to begin with in 1992, has eroded substantially over the past decade.

Section II of this report chronicles the "Collapse of the School District Finance Act." Section III of this report compares the present School District Finance Act with the *Input Standard of Suitability* agreed upon by the Kansas Legislature and State Board of Education, with costs measured by Augenblick and Myers of Denver, CO. Section IV of this report details a number of the critical flaws underlying the "cost adjusted first tier" of SDF from the outset. Section V raises questions about the accountability component, the Quality Performance Accreditation Act, and the failure of QPA to guarantee children the opportunity to attend minimally adequate schools. Section VI addresses a significant emerging concern among education policy analysts, the quality of teaching, and the distribution of quality teachers across public school districts. Section VII summarizes numerous alternative analyses and existing literature on the relationship between school finance reforms, additional funding, and student outcomes. Section VIII provides an overview of the racially disparate effects that result from arbitrary and miscalculated cost adjustments. Finally Section IX addresses problems associated with special education funding.

II. THE COLLAPSE OF THE KANSAS SCHOOL DISTRICT FINANCE ACT

In this section, I lay out how revenues and expenditures of Kansas school districts have fallen significantly behind national average growth rates and most other states over the period from 1992 through 2001. Perhaps more importantly, however, I show how larger districts disadvantaged by flaws in the present pupil weighting system have been least well funded relative to their peers nationally, and have reached critically low levels of funding over time.

A. Falling Behind: Kansas Schools in the National Context

Table 5 compares current instructional expenditures per pupil of Kansas K-12 unified school districts, by enrollment, with current instructional expenditures per pupil of K-12 unified school districts nationally, from 1993 through 2001. Note that over that period, Kansas districts on average, fell from 7% to 15% behind national averages (up to 29% behind if all districts, not just K-12 unified districts are included in the national sample). By 2000, all Kansas districts were well below national averages.

There are substantial differences, however, in the deficit (relative to national averages), by size. While Kansas districts with less than 300 pupils exceeded national averages for a period, districts with 1,725 to 10,000 students started the period with 17 to 18% deficits, and ended the period with 20 to 25% deficits. Districts with over 10,000 students, which started the period at comparable levels to their national peers, ended the period 11% behind.

Table 5
Difference Between Current Instructional Expenditures per Pupil and Average Instructional Expenditures per Pupil for K-12 Unified School Districts Nationally

		By District Enrollment Category				
Year	All Kansas Districts	<300	300 to 1,725	1,725 to 5,000	5,000 to 10,000	>10,000
1993	-7%	1%	-5%	**-18%**	**-17%**	0%
1994	-7%	4%	-3%	**-15%**	**-18%**	-2%
1995	-9%	5%	-5%	**-17%**	**-19%**	-4%
1996	-8%	2%	-6%	**-17%**	**-20%**	-1%
1997	-12%	0%	-10%	**-19%**	**-25%**	-6%
1998	-13%	-1%	-10%	**-19%**	**-25%**	-8%
1999	-14%	-4%	-12%	**-19%**	**-24%**	-10%
2000	-15%	-9%	-14%	**-20%**	**-25%**	-11%

Data Source: U.S. Bureau of the Census Fiscal Survey of Local Governments (F-33) 1993 to 2001[20]

Table 6 presents a similar analysis, but using data on all current (instruction, service, other) expenditures per pupil. Again, the overall gap increases substantially over the period, but from only 1% up to 7%. In Table 6, Kansas' smallest school districts

[20] Available in SAS format for individual years, or in STATA format with all years merged into one file.

enjoy a substantial relative advantage from 1994 to 1998 compared with their peers national and a slight edge as of 2000. Again, districts with 1,725 to 10,000 pupils fall well behind their peers nationally, and the gap for districts with 5,000 to 10,000 pupils grows substantially over the period.

Table 6
Difference Between Current Expenditures per Pupil and Average Current Expenditures per Pupil for K-12 Unified School Districts Nationally

		By District Enrollment Category				
Year	All Kansas Districts	<300	300 to 1,725	1,725 to 5,000	5,000 to 10,000	>10,000
1993	-3%	8%	4%	**-15%**	**-11%**	3%
1994	-1%	14%	6%	**-13%**	**-12%**	2%
1995	-3%	14%	4%	**-15%**	**-12%**	2%
1996	-2%	13%	3%	**-14%**	**-13%**	3%
1997	-3%	11%	2%	**-14%**	**-17%**	2%
1998	-4%	10%	1%	**-13%**	**-16%**	1%
1999	-6%	7%	-2%	**-14%**	**-17%**	-2%
2000	-7%	3%	-4%	**-14%**	**-17%**	-3%

Data Source: U.S. Bureau of the Census Fiscal Survey of Local Governments (F-33) 1993 to 2001

Table 7 summarizes the results of a statistical test of the growth rates of each of the following resource measures, from 1992 through 2000, by state.

1. Current instructional expenditures per pupil[21]
2. Current expenditures per pupil[22]
3. Current expenditures per pupil less state revenues[23] for special education students, per pupil
4. Total federal, state and local revenues per pupil[24]

[21] 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

[22] 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

[23] variable C05 subtracted from current expenditures

[24] Federal revenues include direct grants-in-aid to schools or agencies, funds distributed through a state or intermediate agency, and revenues in lieu of taxes to compensate a school district for nontaxable federal institutions within a district's boundary. Includes all restricted and unrestricted payments made directly by the State government to local education agencies. These payments include but are not limited to foundation or basic support, transportation, pupil targeted programs (special, gifted, vocational, and adult education), textbook funds, capital outlay, debt service payments on local school debt, property tax relief payments, child nutrition matching payments, employee benefit payments, and loans to local education agencies. Local revenues include revenues from such sources as local property and nonproperty taxes, investments, and revenues from student activities, textbook sales, transportation and tuition fees, and food service revenues. www.nces.ed.gov/edfin

5. State and local revenues per pupil

The statistical test was performed by setting the years 1992 to 2001 as year "0" (1992) to "9" (2001). The resource measures above were used as dependent variables, and "state" and "year," and the interaction between the two, were used as independent variables. Kansas was set as the comparison state. As such, the coefficient on each "state" variable represents the difference in the average resources per pupil across that state's districts with the average for Kansas districts. The coefficient on the year variable represents the average, across states, growth (or decline) in resources per 1 unit change in year (per year). The coefficients on the interaction terms between state and year indicate the difference in change per year in a given state and the change per year in Kansas. Raw output of the regression analyses can be found in Appendix A.

Table 7 summarizes the numbers of states in which resources grew more quickly, and more slowly than in Kansas. A state is counted as having resources grow more quickly than Kansas if the coefficient on the interaction term was positive, and significant at $p<.05$. A state was counted as having resources grow more slowly than Kansas if the coefficient on the interaction term was negative, and significant at $p<.05$.

Regarding current instructional expenditures per pupil, districts in 42 states experienced greater growth than Kansas districts from 1992 to 2001. No states experienced slower growth than Kansas. Regarding current expenditures, 32 states experienced faster growth and only 7 states experienced slower growth. Subtracting special education state revenues from the mix, only 2 states saw slower growth in current expenditures than Kansas. On the revenue side, Kansas districts appear somewhat better positioned than on the expenditure side in the national context, but still behind more states than ahead. I particular, nearly twice as many states saw faster state and local revenue growth than Kansas.

Table 7
Summary Table of State Fixed-Effects Regression Analysis of Change Rates of Various Resource Measures Across States

	States with Higher[(a)] Growth Rates	States with Lower Growth Rates	Average Difference in Annual Growth Rate
Current Instructional Expenditures	**42**	**0**	**$55.20**
Current Expenditures	32	7	$48.84
Current Expenditures less Special Education	35	2	$61.78
Total Revenues	18	13	$17.90
State and Local Revenues	20	11	$17.84

(a) A state is identified as having a "higher" growth rate than Kansas if coefficients on the interaction term between "year" and state (relative to Kansas as the base), is positive, and statistically significant at $p<.05$. States with lower growth rates are those that had statistically significantly lower ($p<.05$) rates of change than Kansas.

B. The Uneven Distribution of Emerging Fiscal Stress

Table 8 presents a *What if* analysis addressing whether Kansas general fund budgets per pupil, and their growth rate over time, would have been sufficient for allowing Kansas school districts to increase their instructional spending per pupil at rates comparable to the national average growth in instructional spending (but starting at Kansas 1992 levels). That is, could Kansas districts have used "General Fund Budgets" alone to support national average instructional spending growth from 1993 to 2000. This test is predicated on the assumption that General Fund Budgets, the "cost adjusted first tier" of SDF, were intended to be "suitable" in 1992 and remain "suitable" from 1992 to present. In general, school districts nationally tend to spend about 60 to 70% of their budgets (depending in part on district size) on instruction. Of interest are (a) whether Kansas districts would have spent significantly more or less than that typical range and more importantly (b) whether instructional shares start to "squeeze" out other necessities over time.

Table 8 shows that Kansas' largest districts had relatively high instructional shares to begin with, and that those shares would have crept slightly upward over time had they kept pace with national averages. Most striking however, is that districts with 1,725 to 5,000 pupils would have seen an increase in general fund budget use of 12% to instruction from 1993 to 2000. In fact, the real change for those districts, using their actual instructional spending instead of adjusting to national growth rates, was 10% (from 70% to 79%). Instructional shares also crept upward in smaller districts, but at lower levels, as expected.

One implication of these findings is that General Fund Budgets per pupil were likely insufficient to begin with for the largest districts in the state, requiring immediate implementation of local option budgets simply to cover existing instructional and non-instructional costs. For mid-size districts (1,725 to 5,000), the stress of attempting to maintain programs increased dramatically over time as growth in basic instructional costs squeezed out remaining general fund revenue.

Table 8
Instructional Expenditures per Pupil as a Percent of General Fund Budgets per Pupil over Time, by District Enrollment

		By District Enrollment Category				
Year	All Kansas Districts	<300	300 to 1,725	1,725 to 5,000	5,000 to 10,000	>10,000
1993	67%	57%	57%	**67%**	**73%**	**81%**
1994	69%	54%	59%	**71%**	**73%**	**83%**
1995	72%	56%	61%	**76%**	**74%**	**85%**
1996	72%	59%	61%	**76%**	**74%**	**84%**
1997	73%	59%	62%	**77%**	**75%**	**87%**
1998	72%	58%	61%	**76%**	**72%**	**84%**
1999	73%	59%	63%	**77%**	**73%**	**84%**
2000	75%	59%	64%	**79%**	**76%**	**85%**

Data Source: General Fund Budgets from KSDE. Instructional Spending per Pupil from U.S. Bureau of the Census Fiscal Survey of Local Governments (F-33) 1993 to 2001

Table 9 presents an alternative view, comparing Kansas districts' current expenditures per pupil (at their actual growth rates, which were slower than national averages), to Kansas districts' general fund budgets per pupil. One might assume, for example, that the "cost adjusted first tier" of a logical, rational funding formula would be sufficient for covering the average current expenditures per pupil at the time of implementation (1992). In this example, I use Kansas districts' actual (not national growth adjusted) current expenditures per pupil which, in general, grew more slowly than current expenditures of similar sized K-12 unified districts nationally. Because general fund aid is not intended to cover special education costs, special education state revenues have been removed from current expenditures per pupil. In addition, federal revenues have been subtracted, in an effort to focus on that portion of current expenditures per pupil derived from general and supplemental fund budgets.

Table 9 indicates that by 1993, current expenditures per pupil in large (>10,000 pupils) districts were already 21% above (1.21 times) their general fund budget allocation – their theoretically "suitable" cost adjusted base aid. That is, these districts already needed to nearly maximize local option mill levies.

Note that back in Table 6, districts with 5,000 to 10,000 pupils fell from 11% to 17% behind national average current expenditures per pupil from 1993 to 2000. Even while falling behind national peers at such a rapid rate, current expenditures per pupil in these districts rose from 3% above to as high as 10% above their general fund allocations per pupil, reaching a point at which local option budgets were required to merely sustain educational programs. **That is, growth in general fund budgets for these districts (5,000 to 10,000 pupils) was not even sufficient to allow them to fall from 11 to 17% behind peer districts nationally. LOBs were required to "hold the harm" to those levels.** Also from Table 6, districts with 1,725 to 5,000 pupils managed to hold their own at 14% to 15% behind national average current expenditures per pupil, but Table 9 indicates that doing so increased their ratio of current expenditures to general fund revenues from 1.02 to 1.14, again requiring significant use of local option budgets simply to reduce the erosion.

Table 9
Current Expenditures per Pupil as a Ratio to General Fund Budgets per Pupil over Time, by District Enrollment

Year	All Kansas Districts	By District Enrollment Category				
		<300	300 to 1,725	1,725 to 5,000	5,000 to 10,000	>10,000
1993	1.04	0.96	0.95	**1.02**	**1.03**	**1.21**
1994	1.07	0.98	0.97	**1.07**	**1.06**	**1.22**
1995	1.07	0.98	0.98	**1.07**	**1.08**	**1.23**
1996	1.09	1.00	0.99	**1.09**	**1.08**	**1.26**
1997	1.09	1.02	1.01	**1.10**	**1.04**	**1.24**
1998	1.10	1.02	1.02	**1.11**	**1.04**	**1.23**
1999	1.09	1.02	1.02	**1.08**	**1.04**	**1.22**
2000	1.12	1.01	1.03	**1.13**	**1.10**	**1.24**
2001	1.14	1.03	1.06	**1.14**	**1.09**	**1.27**

Data Source: General Fund Budgets from KSDE. Current Expenditures per Pupil from U.S. Bureau of the Census Fiscal Survey of Local Governments (F-33) 1993 to 2001

C. Shifting the Burden Back to Local Communities

A major implication of each of the previous two analyses is that Kansas school districts have been increasingly required to rely on local tax sources simply to maintain their 1992 status, if not to fight off even more significant erosion. Further, that stress has been felt unevenly across districts by their size, with the largest districts requiring local intervention from the outset, and mid-sized districts facing dramatic increases in fiscal stress, and need for revenue enhancement throughout the 1990s.

Table 10 summarizes the use of Local Option Budgets over time across Kansas school districts by enrollment category. Overall, local option budgets grew from an average of 5% above general funds in 1993 to 17% by 2001. For the smallest districts, local option budgets grew from an average of 1 to 2% to an average of 9 to 12%.

Table 10
Changes in the Use of Local Option Budgets over Time, by District Enrollment

	All			<300			300 to 1,725		
Year	**GFBPP**	**LOBPP**	**LOB%**	**GFBPP**	**LOBPP**	**LOB%**	**GFBPP**	**LOBPP**	**LOB%**
1993	$4,255	$228	5%	$6,625	$145	2%	$5,116	$ 70	1%
1994	$4,325	$341	8%	$6,947	$230	3%	$5,237	$ 120	2%
1995	$4,344	$387	9%	$7,006	$296	4%	$5,260	$ 161	3%
1996	$4,407	$426	10%	$7,056	$362	5%	$5,312	$ 189	4%
1997	$4,479	$467	10%	$7,109	$400	6%	$5,369	$ 194	4%
1998	$4,591	$524	11%	$7,288	$536	7%	$5,471	$ 263	5%
1999	$4,725	$629	13%	$7,356	$579	8%	$5,539	$ 400	7%
2000	$4,825	$721	15%	$7,431	$572	8%	$5,668	$ 523	9%
2001	$4,918	$838	17%	$7,648	$713	9%	$5,775	$ 667	12%

Source File: 1993 to 2001 KSDE General and Supplemental Fund Data

For larger (1,725 to 5,000 pupils) districts, local option budgets grew from an average of about 3% to nearly 20%. This finding is consistent with the previous findings (table 8 and table 9) that indicated dramatic increases in instructional cost stress on general fund budgets and in the rate at which current expenditures were outstripping general funds from 1993 to 2000. Also consistent with Table 8 and Table 9 is the finding that the largest districts jumped right in at the outset of SDF with LOBs at an average of 14%, and that LOBs had grown to an average of 23% in the largest districts by 2001.

Table 10 cont'd
Changes in the Use of Local Option Budgets over Time, by District Enrollment

	1,725 to 5,000			5,000 to 10,000			>10,000		
Year	**GFBPP**	**LOBPP**	**LOB%**	**GFBPP**	**LOBPP**	**LOB%**	**GFBPP**	**LOBPP**	**LOB%**
1993	$3,741	$98	**3%**	$3,701	$118	**3%**	$3,746	$ 522	**14%**
1994	$3,800	$197	**5%**	$3,757	$155	**4%**	$3,779	$ 740	**20%**
1995	$3,828	$247	**6%**	$3,774	$184	**5%**	$3,806	$ 798	**21%**
1996	$3,900	$282	**7%**	$3,872	$230	**6%**	$3,873	$ 848	**22%**
1997	$3,983	$358	**9%**	$3,965	$271	**7%**	$3,959	$ 887	**22%**
1998	$4,097	$430	**10%**	$4,042	$334	**8%**	$4,123	$ 908	**22%**
1999	$4,255	$552	**13%**	$4,194	$509	**12%**	$4,260	$ 948	**22%**
2000	$4,344	$652	**15%**	$4,333	$588	**14%**	$4,352	$ 985	**23%**
2001	$4,428	$831	**19%**	$4,413	$813	**18%**	$4,449	$ 1,010	**23%**

Source File: 1993 to 2001 KSDE General and Supplemental Fund Data

Table 8 and Table 9 implicated the potential need for supplements of general fund budgets exceeding 25% to cover current expenditures per pupil. Yet, local option budgets are capped at 25% above general fund budgets. How then, is a district supposed to meet its current expenditure needs? For one, in recent years, local option budget authority has been "adjusted" to include revenues received for special education in the calculation of the 25% cap. The effect of this adjustment was an increase in the LOB cap to somewhere between 30% and 35% above general fund budgets, using the prior calculation method. Kansas districts have also sought creative ways to use capital outlay revenues to relieve stress on general fund budgets. Further, the cap on capital outlay mill levies, which used to stand at 4 mills, no longer exists. In addition, though not entirely a recent development,

districts have begun to explore alternatives such as economic development sales taxes to reduce their budgetary stress. Finally, districts have begun to increase their solicitation of private contributions to non-profit local education foundations of which the primary mission is to provide financial support for specific local public school districts.

Table 11 displays the 2001 – 2002 sources of revenues available for current expenses for Johnson County and Wyandotte County school districts. Districts are ranked from highest to lowest state, county and local source revenue per pupil. The most notable feature of Table 11 is that only one district, Piper-KC, falls within the 25% limit assumed to be the limit on local discretionary revenues, used primarily for *current expenditures*. Note that Piper is also the district that receives the most low enrollment aid. For other districts in Table 11, the local discretionary share above general fund budgets goes as high as 41%.

Table 11
Estimation of Cumulative Local Discretionary Shares of Revenues for Selected Kansas City Area School Districts 2001 – 2002

Name	USD	Adjusted FTE Enrollment[a]	General Fund per Pupil[a]	Local Option Budget per Pupil[a]	Capital Outlay Revenue per Pupil	Sales Tax Revenue per Pupil	Total Revenue per Pupil	Discretionary Share
BLUE VALLEY	229	17,129.5	$ 4,824	$ 1,321	$ 477	$ 201	$ 6,823	**41%**
DESOTO	232	3,473.1	$ 4,899	$ 1,334	$ 230	$ 201	$ 6,664	**36%**
SPRING HILL	230	1,483.4	$ 4,739	$ 1,358	$ 167	$ 201	$ 6,465	**36%**
GARDNER-EDGERTO	231	2,944.0	$ 4,769	$ 1,318	$ 174	$ 201	$ 6,463	**36%**
PIPER-KANSAS CI	203	1,266.3	$ 5,076	$ 1,162	$ 130		$ 6,368	**25%**
OLATHE	233	20,312.0	$ 4,566	$ 1,288	$ 248	$ 201	$ 6,303	**38%**
TURNER-KANSAS C	202	3,432.8	$ 4,758	$ 1,319	$ 124		$ 6,201	**30%**
KANSAS CITY	500	19,808.1	$ 4,585	$ 1,327	$ 149		$ 6,061	**32%**
SHAWNEE MISSION	512	29,677.4	$ 4,278	$ 1,206	$ 362	$ 201	$ 6,046	**41%**
BONNER SPRINGS	204	2,175.8	$ 4,467	$ 1,179	$ 295		$ 5,942	**33%**

a) FY02 General Fund and Legal Max
b) Based on capital outlay mill levy (KSDE Mill Levy File) times assessed valuation per pupil (KSDE Assessed Value File)
c) Based on Assumption of $15m in annual revenue to be distributed among Johnson County's approximately 75,000 students.

Table 12 summarizes the revenues of selected private, non-profit local education foundations (LEFs) whose sole mission is to raise funds for the activities/operations of unified school districts in Kansas. Values in Table 12 are the annual net revenues of LEFs as reported on IRS Form 990. LEF revenues are reported as a share of the district's general fund budget. Note that in most cases, annual revenues of LEFs are relatively low and somewhat erratic. Rarely do they exceed 1% of the district's general fund budget. However, .4% of Blue Valley's general fund budget exceeds $300,000 (.004 x [17,130 x 4824]). In recent years, Lawrence has been able to maintain 0.5% LEF contributions per year, and Andover 0.6% to 0.8%. In other states, including California and Vermont, LEF fundraising has become a significant component of school revenues, especially in smaller towns with significant wealth. Research by Brian O. Brent on LEFs in California and New York reveals the somewhat obvious equity consequences of relying on private

contributions to support public education. That is, districts with LEFs tend to have fewer low income students and tend to have much higher median family income.[25]

Table 12
Annual Revenues Raised through Not-for Profit Organizations (with annual revenues exceeding $25,000) Providing Direct Support to Kansas School Districts (as a percent of General Fund Budgets)

USD Name	Revenue Share 97	Revenue Share 98	Revenue Share 99	Revenue Share 00	Revenue Share 01
Abiline	.	.	.	.	.
Andover	.	0.4%	0.6%	0.8%	0.7%
Blue Valley	0.4%	.	0.2%	0.2%	0.4%
Hays	.	.	0.3%	0.3%	0.2%
Holton	.	2.4%	0.2%	0.2%	3.6%
Lawrence	.	0.5%	0.9%	0.5%	0.5%
Liberal	.	.	0.0%	0.0%	0.2%
Lyons	.	.	0.8%	7.0%	0.1%
Manhattan	0.0%	.	0.7%	0.1%	0.3%
McPherson	.	0.2%	0.2%	0.3%	.
Paola	.	.	1.3%	2.9%	.
Pittsburg	.	.	.	.	.
Shawnee Mission	.	0.2%	0.2%	0.2%	0.2%
Syracuse	.	.	.	0.0%	0.4%
Topeka	0.1%	0.2%	0.1%	0.1%	0.2%
Vermillion	.	1.4%	.	2.2%	0.2%
Winfield	.	0.3%	0.3%	0.3%	0.2%

Data Source: IRS Form 990 accessed via www.guidestar.org

An important financial objective of LEFs, especially during start-up years, is to accumulate assets, perhaps to build an endowment which can generate investment returns to support educational programs. Table 13 expresses the cumulative assets of Kansas LEFs as a percent of district general fund budgets. Paola and Vermillion, for example, retain significant assets in their LEFs. Lyons also maintains significant assets in their LEF and Andover and Holton have been steadily increasing their assets annually.

[25] Brian O. Brent (2002) Expanding Support Through District Education Foundations: A Tale of Two States. *Leadership and Policy in Schools* 1 (1) 30 – 51.

Table 13
Cumulative Assets Raised through Not-for Profit Organizations Providing Direct Support to Kansas School Districts (as a percent of Local Option Budgets)

USD Name	Asset Share 97	Asset Share 98	Asset Share 99	Asset Share 00	Asset Share 01
Abiline	.	.	.	.	.
Andover	.	0.3%	0.8%	1.4%	1.6%
Blue Valley	0.3%	.	0.5%	0.5%	0.6%
Hays	.	.	0.3%	0.4%	0.4%
Holton	.	2.4%	2.4%	2.4%	5.3%
Lawrence	.	0.9%	1.5%	1.6%	1.3%
Liberal	.	.	0.1%	0.1%	0.2%
Lyons	.	.	5.7%	12.3%	9.2%
Manhattan	0.2%	.	0.9%	0.6%	0.6%
McPherson	.	1.4%	1.5%	1.8%	.
Paola	.	.	13.5%	14.3%	.
Pittsburg	.	.	.	.	.
Shawnee Mission	.	0.4%	0.4%	0.5%	0.5%
Syracuse	.	.	.	0.0%	0.4%
Topeka	0.1%	0.2%	0.2%	0.2%	0.2%
Vermillion	.	28.1%	.	28.8%	27.6%
Winfield	.	0.8%	0.9%	0.9%	0.7%

Data Source: IRS Form 990 accessed via www.guidestar.org

D. Aggregate Effects of "Supplemental" Revenue

I begin this section with a summary of the "additional tiers" of local discretionary revenues that now exist in the School District Finance act:

Tier	Revenue Source	Expenditure Options
• **Tier 2:** Local Option Budget	Local property tax with some state, property wealth equalized, matching aid	Annual operating expenses (core educational programs etc.)
• **Tier 3**: Capital Outlay Fund	Local property tax only	May be used for many types of expenses that lead to reduced stress on annual operating budgets
• **Tier 4:** Local and County Economic Development Contributions	Sales Taxes	Annual operating expenses (core educational programs etc.)
• **Tier 5:** Local Education Foundations	Private contributions and investment income	Annual operating expenses (core educational programs etc.)

As noted back in Table 11, local supplements have become quite substantial for some districts. Figure 6 presents a geographic perspective on local supplements (from Tier 2, 3

and 4, but excluding private gifts) across Kansas school districts. Note that the highest supplement category raises from 40 to 52% above general fund budgets and includes a handful of districts (about 7). It appears that about 32 districts across the state exceed 30% supplements, and another 35 districts have supplements from 25% to 30%.

Evaluating the Ability to Supplement

A significant concern is whether these substantial supplements to general fund aid are highly related to measures of ability to pay. That is, do communities with higher median family income tend to raise more supplemental revenues than communities with lower median family income? Does property wealth or the "Tax Price" that results from differences in property wealth per pupil and housing values influence ability to raise additional revenues? As a result, does the quality of education available to children in Kansas vary significantly as a function of local wealth and income? I begin to address these questions with a series of maps of fiscal capacity measures across Kansas districts. I follow the visual analysis with statistical tests of the relationship between fiscal capacity measures and supplemental revenues.

Figure 7 portrays the median family income (MFI) of Kansas school districts. Districts in Blue are higher income districts with the darkest blue representing districts with median family income more than 2.5 standard deviations above the state mean. Districts in the darkest brown are districts more than .5 standard deviations below the state mean. Figure 7 reveals the rather typical pattern of higher median family income in urban areas, but more specifically in suburban areas, with the urban core having significantly lower MFI than its suburban neighbors. See Wichita, Topeka and Kansas City in particular. Some large towns, like Salina, appear to mimic this pattern. It should not be surprising that some of the darkest blue (highest income) districts in Figure 7 are also the darkest red (highest local supplement) districts in Figure 6. However, income is only part of the picture.

Figure 8 presents the relative price in property taxes of an additional $1 in school revenues (without state matching aid). The tax price measure depicted in Figure 8 is derived by dividing the value of the median housing unit (11.5% of full value, less the first $20,000) from Census 2000, by the assessed valuation per pupil of each district (KSDE). For example, if the median voter owns a house worth $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). Tax price measures are particularly useful for sorting out the influence of non-residential property values on local spending.

Figure 8 shows the typical pattern that primarily residential areas, including suburbs and small towns tend to face relatively high tax prices and that predominantly rural areas and the "urban core" have lower tax prices. These patterns result primarily from the distribution of non-residential properties. A central question is, how income and

tax price differences interact to influence the way local communities chooses to spend on its public schools?

In general, the following assumptions are reasonable, setting aside other demographic variables that might influence voter behavior:

- **Low Tax Price with High Income:**
  - Voters in these communities will typically be able to spend much more in local property taxes on their public schools. The price they pay is low, for a dollar of revenue, and represents a relatively small share of their income.

- **High Tax Price with High Income**
  - This pattern is characteristic of suburbs, where high income families live in relatively high valued housing units, and where commercial and industrial real estate, while present, represents a smaller share of taxable property than in urban areas. While less advantageous than the previous conditions, these districts tend to be willing to raise substantial local supplemental revenue for local schools.

- **Low Tax Price with Low Income**
  - In Kansas, this appears (by visual inspection) to be a lower likelihood condition. In general, one might expect these districts to raise more local supplemental revenue than a low income district facing higher tax prices, yet the lagging income (and likely education level and education quality preferences) of local voters is likely to lead to lower education revenues than in high tax price high income suburbs.

- **High Tax Price with Low Income**
  - This would be the least desirable circumstance, but one that is typical on large rural towns (Note Dodge City, Garden City and Emporia with above average – blue – tax price in Figure 8 and below average income – brown – in Figure 7). This is because rural towns lack the industrial and/or commercial base of larger cities, as such, taxable property is primarily residential and also lack high earnings opportunities (reducing both in-town median family income, and the typical suburban/urban donut pattern of income distribution). These districts face significant difficulty in raising additional revenues through local property taxes. This may in part explain Salina's use of an economic development sales tax, because the sales tax may be partially exported to higher income residents of two neighboring districts.

Figure 9 and Figure 10 combine the concepts of income and tax price to specifically evaluate the "effort" required for each Kansas school district to raise an additional $1,000 in revenue through (a) local option budgets and (b) capital outlay. Recall that for local option budgets, the state kicks in matching aid such that each districts has the ability to spend at the level of the 75%ile property wealth district, for a

given mill levy. The effect of matching aid is to reduce the tax price paid in lower property wealth districts. As such, Local Option Effort is calculated as follows:

1. Required Tax Rate = $1,000/75%ile Assessed Value per Pupil (or District Assessed Value per Pupil if > 75%ile)
2. Median Taxable Housing Unit Value = 11.5% x (Median Housing Unit Value - $20,000)
3. Median Tax Bill = Tax Rate x Median Taxable Housing Unit Value
4. Local Option Effort = Median Tax Bill/Median Household Income

The end value, Local Option Effort, is a percent of median family income. Note in Figure 9 that local option effort ranges from less than .1% of median family income to as much as .44% of median family income to raise the same $1,000 per pupil in LOB revenue. Note that LOB revenues appear particularly costly in Salina, as well as many districts on the outer edges of the Kansas City suburbs.

Unlike the LOB, Capital Outlay revenues are not matched with state aid. As such, capital outlay effort is calculated as follows:

1. Tax Rate = $1,000/ District Assessed Value per Pupil
2. Median Taxable Housing Unit Value = 11.5% x (Median Housing Unit Value - $20,000)
3. Median Tax Bill = Tax Rate x Median Taxable Housing Unit Value
4. Capital Outlay Effort = Median Tax Bill/Median Household Income

Note in Figure 10 that raising an additional $1,000 per pupil in Capital Outlay revenue costs local residents anywhere from less than .12% to over 1% of median family income. In particular, districts like Emporia and Junction City appear to be a significant disadvantage while several rural, western Kansas districts require only 1/10 the effort for the same capital outlay dollar.

Figure 6

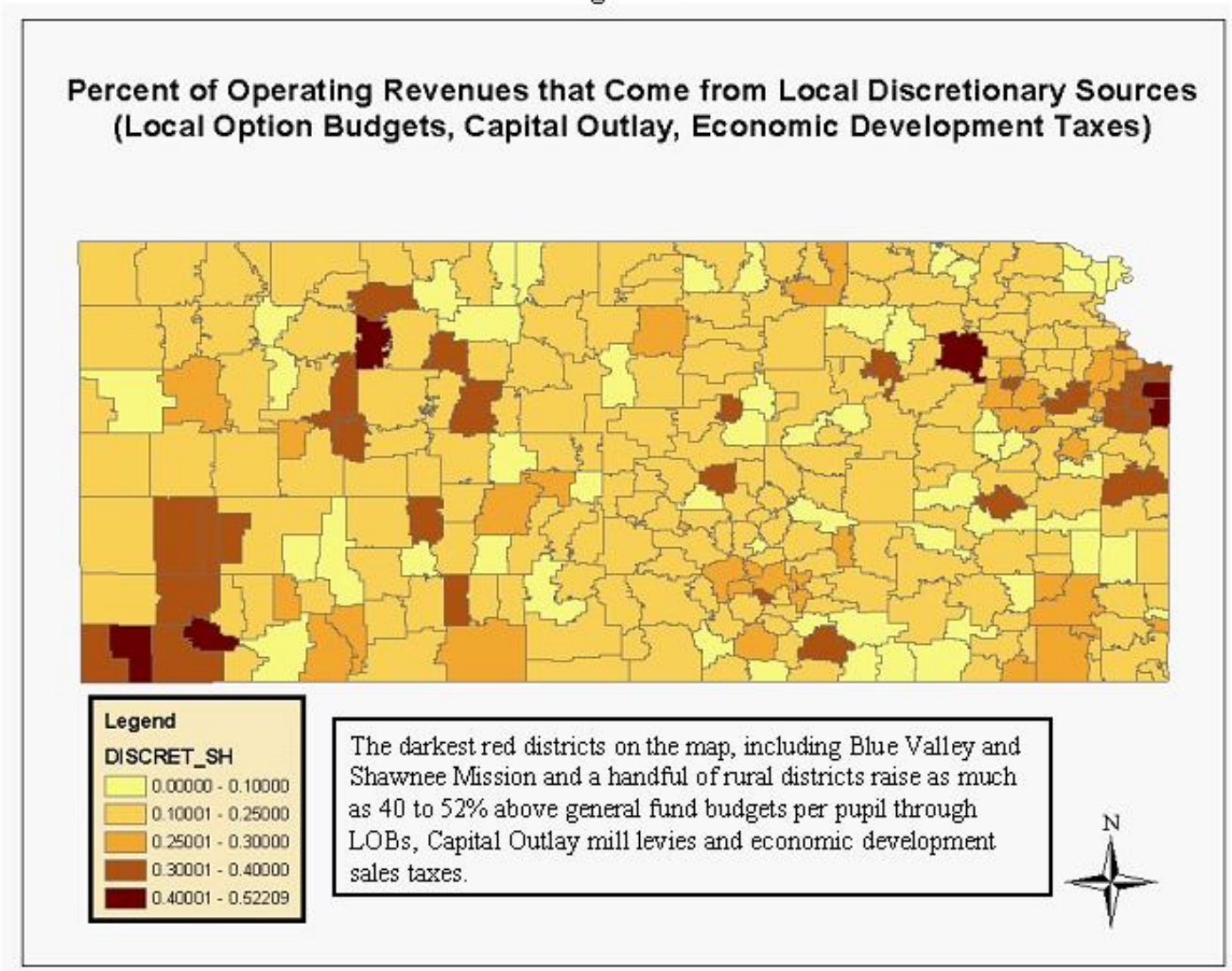

Percent of Operating Revenues that Come from Local Discretionary Sources
(Local Option Budgets, Capital Outlay, Economic Development Taxes)
Legend
DISCRET_SH
0.00000 - 0.10000
0.10001 - 0.25000
0.25001 - 0.30000
0.30001 - 0.40000
0.40001 - 0.52209
The darkest red districts on the map, including Blue Valley and Shawnee Mission and a handful of rural districts raise as much as 40 to 52% above general fund budgets per pupil through LOBs, Capital Outlay mill levies and economic development sales taxes.
N

Figure 7

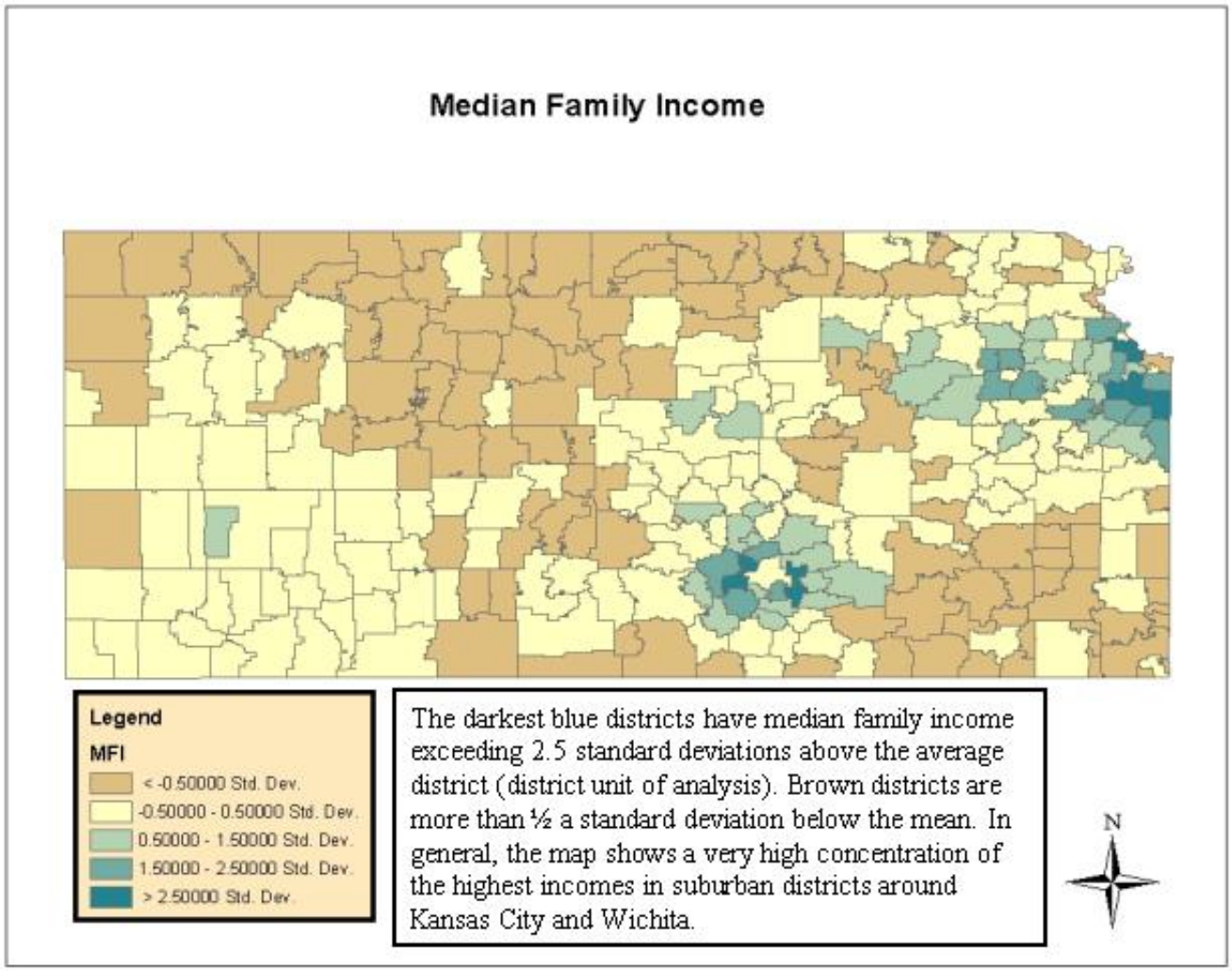

Median Family Income
Legend
MFI
< -0.50000 Std. Dev.
-0.50000 - 0.50000 Std. Dev.
0.50000 - 1.50000 Std. Dev.
1.50000 - 2.50000 Std. Dev.
> 2.50000 Std. Dev.
The darkest blue districts have median family income exceeding 2.5 standard deviations above the average district (district unit of analysis). Brown districts are more than ½ a standard deviation below the mean. In general, the map shows a very high concentration of the highest incomes in suburban districts around Kansas City and Wichita.
N

Figure 8

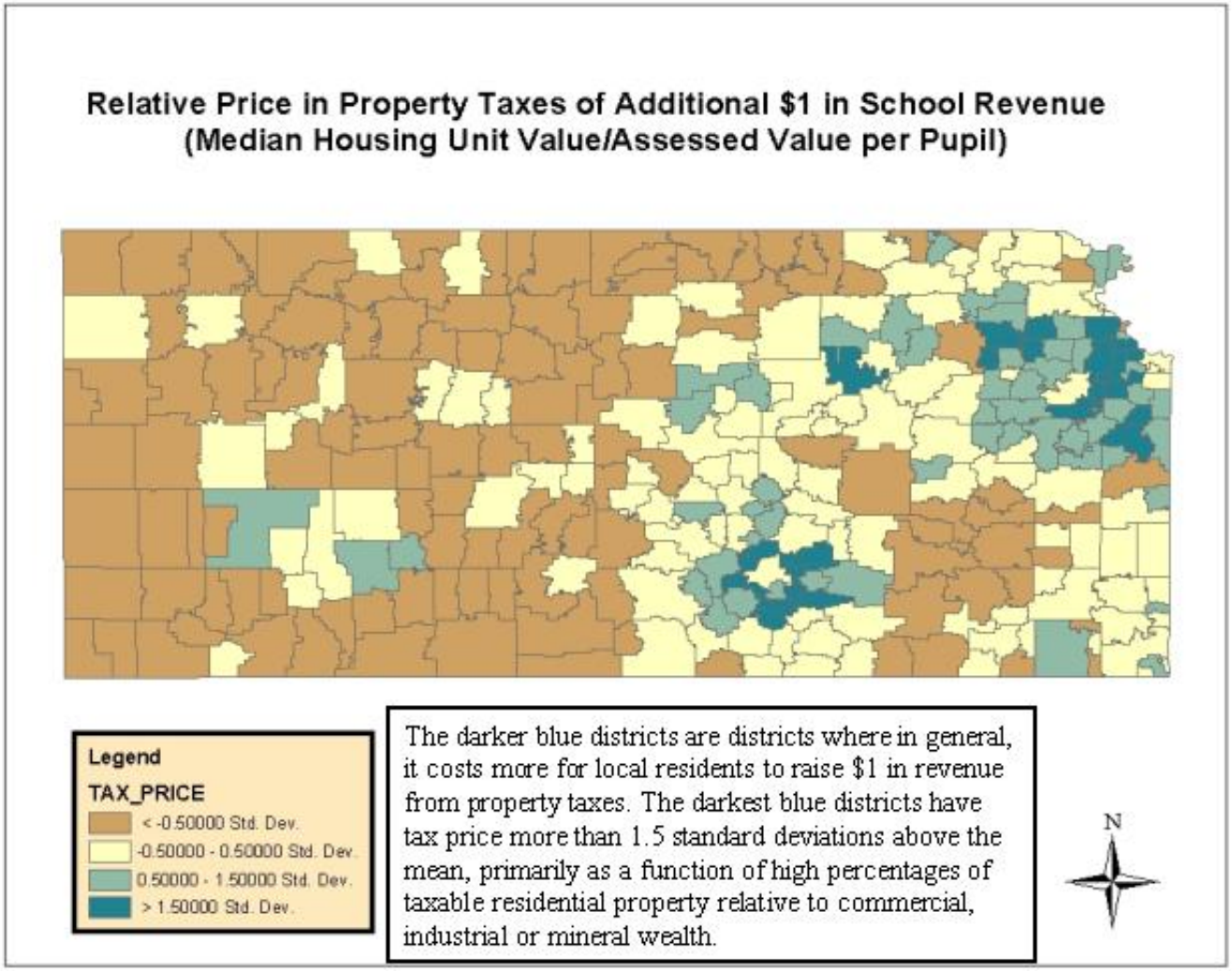

Relative Price in Property Taxes of Additional $1 in School Revenue
(Median Housing Unit Value/Assessed Value per Pupil)
Legend
TAX_PRICE
< -0.50000 Std. Dev.
-0.50000 - 0.50000 Std. Dev.
0.50000 - 1.50000 Std. Dev.
> 1.50000 Std. Dev.
The darker blue districts are districts where in general, it costs more for local residents to raise $1 in revenue from property taxes. The darkest blue districts have tax price more than 1.5 standard deviations above the mean, primarily as a function of high percentages of taxable residential property relative to commercial, industrial or mineral wealth.
N

Figure 9

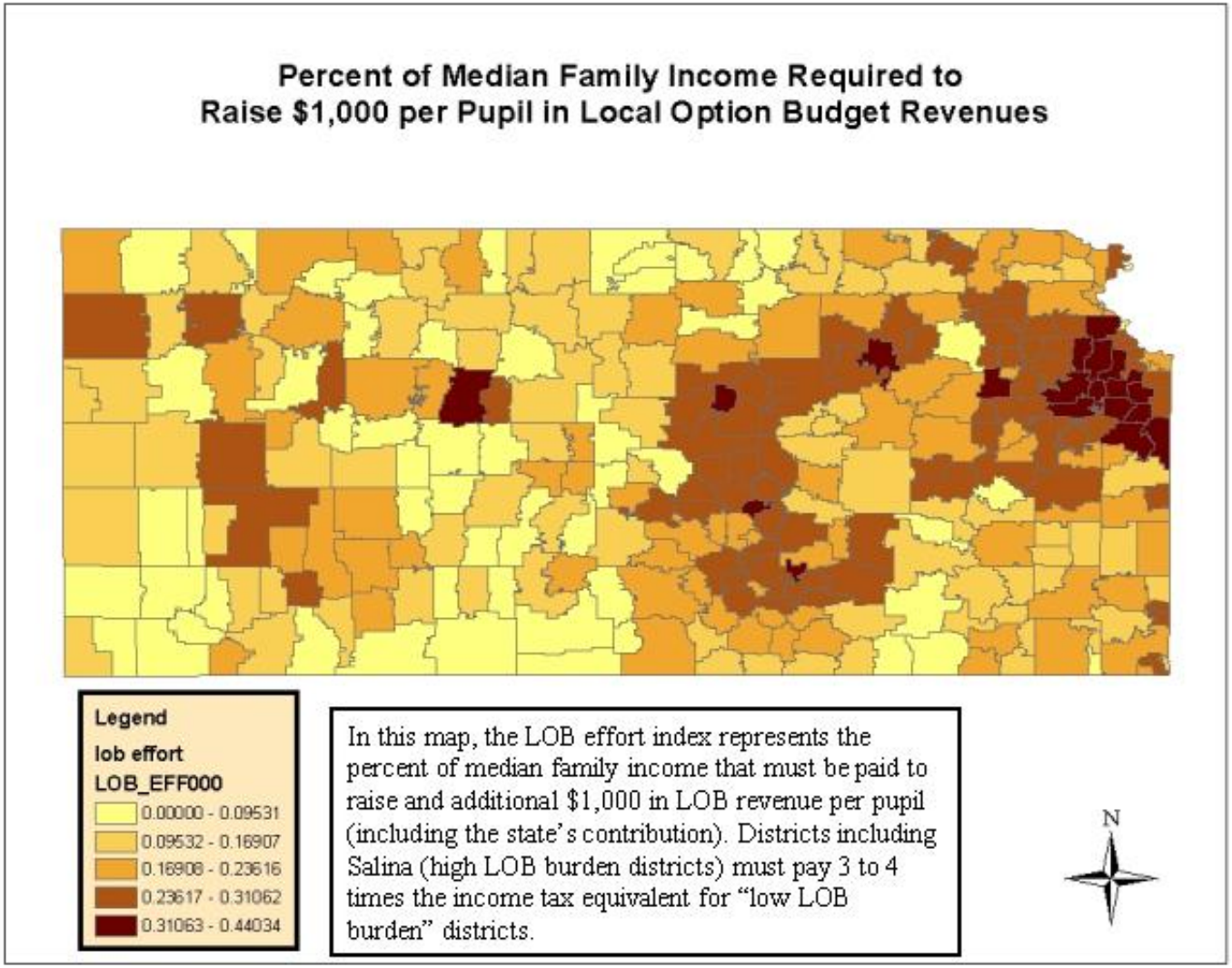
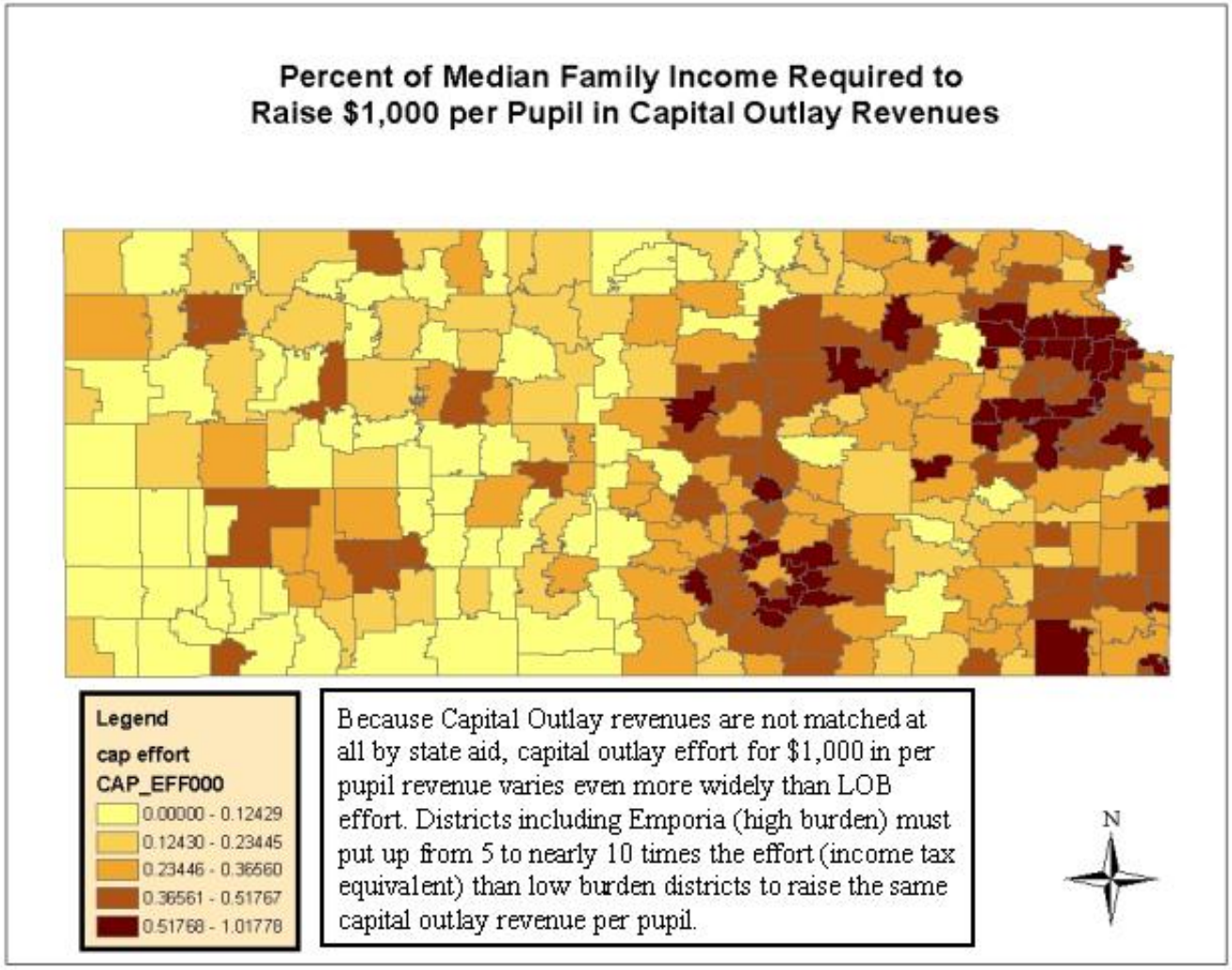

Percent of Median Family Income Required to
Raise $1,000 per Pupil in Local Option Budget Revenues
Legend
lob effort
LOB_EFF000
0.00000 - 0.09531
0.09532 - 0.16907
0.16908 - 0.23616
0.23617 - 0.31062
0.31063 - 0.44034
In this map, the LOB effort index represents the percent of median family income that must be paid to raise and additional $1,000 in LOB revenue per pupil (including the state's contribution). Districts including Salina (high LOB burden districts) must pay 3 to 4 times the income tax equivalent for "low LOB burden" districts.
N

Figure 10


Percent of Median Family Income Required to
Raise $1,000 per Pupil in Capital Outlay Revenues
Legend
cap effort
CAP_EFF000
0.00000 - 0.12429
0.12430 - 0.23445
0.23446 - 0.36560
0.36561 - 0.51767
0.51768 - 1.01778
Because Capital Outlay revenues are not matched at all by state aid, capital outlay effort for $1,000 in per pupil revenue varies even more widely than LOB effort. Districts including Emporia (high burden) must put up from 5 to nearly 10 times the effort (income tax equivalent) than low burden districts to raise the same capital outlay revenue per pupil.
N

Maps, while interesting and revealing of the pattern of income, price and effort disparities across Kansas school districts under SDF, do not establish a statistical linkage between local fiscal capacity measures and local supplemental revenues. To do so requires estimation of a form of "median voter model" of educational spending. That is, a statistical test, in a multivariate regression format, of the relationship between (a) median family income, (b) tax price and (c) an indicator of voter preferences for local schooling (percent of voters over 65 years of age). Such analyses using Kansas data also require inclusion of a "scale" measure (enrollment and enrollment squared) to account for the extent to which scale differences are "overcompensated" in the first tier of SDF (and the extent to which that overcompensation influences local option authority).

Table 14 presents a series of regression analyses that begin by indicating that general fund budgets alone are inversely associated with tax price differences across districts (lower price, higher general fund budget). This result is due to the failure of state officials to account for tax price differences when calculating low enrollment aid (discussed in greater detail in Section IV). When Local Option Revenues are added, revenues per pupil are positively associated with median family income differences across districts, due perhaps to the failure of the local option matching aid to account for income differences. Further, tax price effects are stronger, due to the fact that the LOB is equalized only to the 75%ile level of property wealth. **The addition of capital outlay revenues nearly doubles the magnitude of the relationship between income and total revenues and dramatically increases the relationship between tax price and revenues because no matching aid is provided for capital outlay. Finally, the addition of local and county sales tax revenues further strengthens relationships between local fiscal capacity measures, and school revenues.**

Table 14
Neutrality effects of 2nd, 3rd and 4th tier operating revenue sources

	General Fund Budget per Pupil		**Add Local Option Budget**		**Add Capital Outlay**		**Add Sales Tax**	
	Estimate	*p-value*	*Estimate*	*p-value*	*Estimate*	*p-value*	*Estimate*	*p-value*
Log of Median Family Income	**0.016**	**0.20**	**0.060**	**0.00**	**0.117**	**0.00**	**0.150**	**0.00**
Log of Tax Price	**-0.016**	**0.01**	**-0.046**	**0.00**	**-0.073**	**0.00**	**-0.077**	**0.00**
Percent over 65 yrs of Age	-0.377	0.00	-0.415	0.00	-0.423	0.00	-0.378	0.00
Log of Enrollment	-0.675	0.00	-0.492	0.00	-0.460	0.00	-0.461	0.00
Log of Enrollment Squared	0.036	0.00	0.027	0.00	0.025	0.00	0.025	0.00
Constant	11.386	0.00	10.209	0.00	9.441	0.00	9.065	0.00
R-squared	0.903		0.801		0.796		0.785	

Source File: Tax Effort and Fiscal Neutrality Data File

F. Summary

An earlier title to this section was "Mapping the Train Wreck." The premise was that at some point, perhaps around 1997 – 98 as general fund revenues lagged significantly behind, and rules for local option budgets began to change, that SDF began to take on a new form, no longer resembling its "once logical" structure.[26] That is, SDF reverted to a locally controlled, classically disparate system of school finance.

Upon closer look, and careful disaggregation (by district size relative to national peers) of changes over time, it appears that for many districts (and most Kansas children), **the train was wrecked well before it ever left the station.** This is especially true for districts with greater than 10,000 pupils, who immediately required substantial local option budgets simply for damage control (holding harmless, present current expenditure levels), but also true for districts with 1,725 to 10,000 pupils that were less able to even control the damage until rules for LOB adoption were later altered. **In more recent years, the wrecked portion of the train has further disintegrated and the other end of the train that *may have been* in more reasonable condition to begin with (aid for small districts) has recently gone over the cliff.**

While a greater share of the burden of funding Kansas K-12 schools has been shifted back to both formal and informal local revenue raising mechanisms, **the legislature has made little or no effort to equalize districts' ability to raise supplemental funding.** The result has been a significant erosion of fiscal neutrality, whereby median family income and local property wealth strongly influence the quality of education received by Kansas school children.

[26] These rule changes include allowing districts to raise LOBs without referenda, and the more recent increase in the effective LOB cap to 30 to 35% resulting from counting of special education revenues toward calculation of the cap.

III. THE NEW LEGISLATIVE & STATE BOARD INPUT STANDARD OF SUITABILITY

A. Overview of *Input* vs. *Outcome-based* Conceptions of Adequacy

I begin this section with a brief synopsis of the difference between input and outcome based standards of adequacy, or in the case of Kansas, of "suitability." Note that the first section of this report discusses extensively the design of outcome based "cost adjusted" funding formulae. Input and outcome based approaches may be defined as follows:

- **Input based standard:** An input based standard of educational adequacy is a standard based on the educational resources that should be available to each child. Those resources may include certified teachers, specialists, administrative support staff, library and media support, health professionals, materials, supplies and equipment among other things. Input based standards have been the focus of state school finance litigation dating back to *Pauley v. Kelly* (225 S.E.2d 859, 1979) in West Virginia in which the court identified broad categories of inputs necessary for a "thorough and efficient education." Those categories included curriculum, personnel, facilities, materials and equipment.

- **Outcome based standard:** An outcome-based standard of educational adequacy involves some measure of the student outcomes that all students should be able to achieve having participated in (or having access to) the state's public education system. Those outcomes may be broadly stated in terms of things like the ability to be a productive citizen (able to understand issues well enough to be an informed voter), or may be much more specific and based on tests of academic achievement and/or performance related to state adopted curricular standards. Note that Kansas has adopted a series of statewide assessments which may be used as the basis for inferring an "outcome based standard."

B. Origins of the *Input Standard of Suitability*

On December 1, 2001 a citizen task force formed under Governor Bill Graves released a report that included the following recommendation to the Kansas Governor and Legislature:

> To date, no one has defined what constitutes a suitable education in Kansas. Therefore, it has been impossible to put a price tag on it. When the current school finance formula was drafted, cost figures including the base state aid of $3,600 per pupil and the various pupil weightings were derived primarily from political deliberation. The Task Force concluded that it is of critical importance that the first step toward public education finance reform in Kansas is to conduct a professional evaluation to determine the cost of a suitable education.
>
> Determining the cost will first require deciding what all Kansas schools should be able to offer to all Kansas children. Subsequently, the cost of offering such an education in different

types and sizes of schools in different regions of the state, and taking into account the diverse populations of students must be estimated. Important considerations include:

a. The cost of providing comparable opportunities in the state's small rural schools as well as the larger, more urban schools, including differences in transportation needs resulting from population sparsity as well as differences in annual operating costs;
b. The cost of providing suitable opportunities in elementary, middle and high schools;
c. The additional costs of providing special programming opportunities, including vocational education programs;
d. The additional cost associated with educating at-risk children and those with limited English proficiency; and
e. The additional cost associated with meeting the needs of students with disabilities.

Consideration must be given to geographic variations in costs of personnel, materials, supplies and equipment and other fixed costs so that districts across the state are afforded comparable purchasing power. The cost of the proposed professional evaluation is estimated at $450,000. (Chair, David Brant)

By the close of the Kansas legislative session of 2002, the legislature had set aside funding to pursue the task force recommendation of estimating the cost of a suitable education. A legislative coordinating council, in drafting the request for proposals for the study chose to define "suitable" in terms of a "curricular program consisting of the subjects and courses…" That is, they chose to define suitable as a curricular **"input standard,"** where that curricular standard would be based on the **"subjects and courses required under the provisions of K.S.A. 72-1101, 72-1103 and 72-1117."**

The Kansas State Board of Education then chose to add other curricular, non-curricular and co-curricular inputs as necessary to the provision of a suitable education in Kansas. Those inputs included resources to insure school safety, early childhood programs, appropriate class size, technology training, foreign language, fine arts, nursing and counseling services among other things.

C. Measurement of the *Input Standard of Suitability*

The consulting firm of Augeblick and Myers (Denver, CO) was awarded the contract to estimate the costs of a suitable education according to the input-based standards stated above. The consultants applied two methodologies in order to estimate the cost of a suitable education:

1. **Professional judgment:** The professional judgment approach involves meeting with teams of education professionals and other interested parties to identify the inputs necessary for providing adequate, or suitable educational programs in prototypical schools or districts. Professionals identify necessary staffing configurations, materials, supplies and equipment for delivering a specific educational program (or set of programs) under different conditions (different school district sizes, different

populations of students). Professional judgment approaches are designed to meet an **"input standard"** or adequacy.[27]

a. Augenblick & Myers convened teams of education experts across Kansas
b. They worked with those teams to identify appropriate staffing configurations, materials, supplies and equipment needs for very small, small, medium and large school districts
c. They then assigned prices to each component and summed those prices to arrive at the cost of providing suitable inputs.
d. The base cost of providing suitable inputs in large school districts (those with the lowest cost), was estimated (with 2000 – 2001 prices) to be $5,811.

2. **Successful schools:** The "successful schools" approach involves identifying a set of schools or districts that meet a given set of outcome standards and then taking the average expenditure levels of those districts. "Successful schools" is designed to meet an "outcome based" standard of adequacy. However, "successful schools" is methodologically inadequate for doing so, in that it fails to account for variations in student populations and district characteristics that affect the costs of achieving a given set of outcomes.[28] Note that the legislative coordinating council specifically recognized the need to calculate the costs associated with meeting the needs of various student populations. In simple terms, the "successful schools" approach is analogous to estimating the cost of producing a given crop yield on only the most fertile fields under the best weather conditions. **Augenblick and Myers finding of a base cost of $4,547 via "successful schools" analysis is irrelevant to the discussion at hand for two reasons: (1) that it does not meet an input standard of adequacy as identified by the legislative coordinating council and state board of education and (2) even if an outcome standard were articulated, "successful schools" fails to estimate the different costs of achieving that standard for students with different needs or students in districts facing different costs as requested by the LCC.**

After completing their analysis, Augenblick and Myers made recommendations for a new school finance formula. Those recommendations included a base state aid per pupil of $4,650, which appeared to be based on their "Successful Schools" findings rather

[27] Note that according to a status report of the Legislative Education Planning Committee, "A&M believes that the PJ [Professional Judgment] approach is more consistent with the expectations of the RFP." That is, the LEPC recognized that the consultants considered their "professional judgment," input based analysis to be a more appropriate methodology for measuring suitability as defined in the request for proposals for the suitability study. See Page 3 of "Legislative Educational Planning Committee: School Finance Suitability Study."

[28] Technically, one might classify "successful schools" under the framework of the "education cost function," which attempts to estimate the costs of achieving a given set of student outcomes. The "successful schools" model is the equivalent of cost function with one independent variable – district or school outcomes– and one dependent variable – expenditures. Academic standards for the education cost function at the very least include controls for differences in student population characteristics and in district structural characteristics. More technically advanced education cost functions also attempt to consider the relative efficiency of school districts such that inefficiencies that may vary non-randomly across districts do not inflate estimates of costs overall and/or disproportionately for types of districts with greater inefficiencies. Finally, most recent academic research using education cost functions also considers the circular nature of the spending – outcomes relationship, using simultaneous equation methods to reduce the effects of "endogeneity." That said, "successful schools" meets none of these requirements.

than their professional judgment findings. They then recommended using weights they had derived from their professional judgment analyses to adjust funding to meet both district cost needs and student needs (limited English proficient, at risk and special education).

It should be noted that combining the arbitrarily low base aid recommendation of $4,650, creates compounded shortfalls in districts abilities to meet students' special needs. For example, A&M found the base cost (cost of education for the average pupil in a general education program) per pupil for a large district to be $5,811 and the cost of serving a special education student to be $12,090, creating a ratio of 2.08. Those costs were determined directly by identifying the inputs necessary for providing suitable services. Using a base of $4,650, with the weight of 2.08 produces a total allotment of $9,672 for the special education child in the large district. That is, their own formula recommendation yields a deficit of $2,418 per special education pupil in large districts, that deficit being relative to their own estimated input standard of adequacy.

Aligning Input Based and Outcome Based Analysis

Ideally, empirical findings of thorough input based analysis can be aligned with empirical findings of outcome based, cost function analysis. Ideally, input-based cost analyses should be based on empirically justifiable assumptions that the different mixes of inputs to be used with different children, under different circumstances are associated with producing comparable outcomes. Underlying both input based and outcome based analyses are assumptions that certain quantities of resources, and certain qualities of resources are required for achieving outcome objectives with different children, under different circumstances. That is, children with certain special needs may require more contact with qualified professionals to achieve desired outcomes. Further, those qualified professionals may come at a different price in different parts of the state. Similarly, different size districts may require different staffing ratios simply to yield comparable outcomes. Prices of similar "quality" staff may vary from location to location.

If input based analyses pay adequate attention to (a) variations in *intensity* of resources required to yield comparable outcomes under different circumstances, (b) variations in *intensity* of resources required for meeting certain students needs (toward comparable outcomes), (c) variations in *qualities* of resources required for meeting certain students needs (toward comparable outcomes) and (d) variations in prices of resources, then the findings of input based analyses may be quite similar to those of outcome based econometric estimates. Because a critical element in this puzzle is the distribution of resources by *quality*, and because teachers are perhaps the most important resource in schools, Section VI of this report specifically addresses teacher quality concerns and the distribution of teachers across Kansas districts by indicators of quality.

D. Comparison of *Suitable* Funding to Current Law (SDF)

A spreadsheet simulation/interpretation of Augenblick and Myers formula recommendations was constructed using school year 2000 data from the National Center for Education Statistics Local Education Agency Universe (LEAU) Survey and F-33 Fiscal Survey of Local Governments (U.S. Census Bureau). These data were used in place of Kansas State Department of Education school finance data for a number of reasons, some of which were merely related to convenience. First, the A&M formula recommendations include an option for weighting students with disabilities as part of the general education formula. As such, it was necessary to compare A&M formula outcomes with total current expenditures per pupil for Kansas districts including special education expenditures (with federal source funds excluded), rather than making comparisons to KSDE reports of general and supplemental fund revenues which do not include special education revenues. Second, NCES data are more readily merged with the geographic cost of education index recommended by A&M and produced for NCES by Jay Chambers of the American Institutes for Research (www.air.org) using 1993 – 94 school staffing data. Third, NCES data includes counts of limited English proficient children rather than bilingual education contact hours. It is important to note that the A&M professional judgment analysis is somewhat ambiguous (referring to "children" in bilingual programs, rather than FTE pupils) as to whether prescribed LEP weights are to be allocated on the basis of current contact hour calculation or on the basis of LEP pupil counts.

The simulation includes Augenblick & Myers recommendations for (a) economies of scale adjustments, (b) bilingual education program adjustments (c) at risk adjustments (d) special education weightings and (e) options for including a geographic cost of education index. The base may be adjusted and special education weights may be included or excluded. The simulation does not include (a) the recommendation to retain but extend to 3 years the current new facilities weight, due to the inability to easily project future numbers of children in new facilities or (b) the recommendation to keep transportation weight the same but adjust the minimum distance to 1.25 miles, because data on numbers of children living from 1.25 to 2.5 miles from school were unavailable.

Two issues must be noted regarding application of the NCES GCEI with the A&M analyses and recommendations. First, it is becoming increasingly well known to economists and policy analysts that the NCES GCEI fails to adequately compensate district's harsh working conditions. For example, the NCES GCEI assumes that it would cost Kansas City Kansas less to recruit a teacher of average qualifications than it would cost for Blue Valley. The rapidly expanding body of research literature on teacher labor markets suggests otherwise.[29] Second, the NCES GCEI cannot reasonably be implemented in conjunction with base figures estimated by A&M via professional judgment because A&M's professional judgment analyses already include differentiated

[29] Recent literature, for example, highlights the inability of districts with high percentages of at risk and minority populations to recruit highly qualified teachers under present salary conditions, even where differentials exist. Hamilton Lankford, Susanna Loeb and James Wyckoff (2002) Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis. Educational Evaluation and Policy Analysis 24 (1) 37-62. Jennifer Imazeki (2001) Moving On or Moving Out? Determinants of Job and Career Changes for Teachers. Working Paper, Department of Economics, San Diego State University. P. 30. Eric Hanushek and Steven Rivken (2000) Teacher Quality and School Reform in New York. Symposium on Teacher Labor Markets, Rockefeller School of Government. SUNY Albany.

salaries for small, moderate and large districts. As such, adding the GCEI on top of the professional judgment base figure and adjustments would double count these cost differences. Note that this issue is not avoided when using the $4,650 base figure, because all cost adjustments for special education, bilingual education and at risk children were derived from staffing cost differences in small, medium and large districts and are, as a result, influenced by the different salaries used in those analyses. **As a result of these caveats, the most appropriate "input standard of suitability" is a formula with a base aid of $5,811 and no geographic cost adjustment (until an appropriate adjustment can be determined).**

Table 15 displays one version of simulation output from the simulation of the Augenblick and Myers recommendations, but using the appropriate input standard of suitability of $5,811 and leaving out the NCES cost of education index. Not surprisingly, all districts benefit substantially from this option. As a percentage increase, districts with 1,726 to 9,999 students benefit most, with a 54% increase in state revenues per pupil (including special education weighting), compared with current expenditures per pupil (including special education revenues, but excluding federal revenues) in 2000.

Table 15
Sample Simulation Output Comparing Current Expenditures per Pupil (Fiscal Survey of Local Governments 2000) with A&M Projected Revenues per Pupil by Enrollment

Enrollment Group	Pupils	SDF Current Expenditures per Pupil 2000 (F-33)[30]	A&M Cost Adjusted Base Aid per Pupil	Gain/Loss per Pupil
<100	660	$ 9,728	$ 11,439	$ 1,711
100 - 299	12,244	$ 7,340	$ 10,334	$ 2,994
300 - 999	82,420	$ 6,273	$ 8,979	$ 2,706
1000 - 1725	50,621	$ 5,588	$ 8,464	$ 2,876
1726 - 9999	159,865	$ 5,297	$ 8,167	$ 2,869
>10000	162,537	$ 5,908	$ 8,004	$ 2,096
Average		$ 5,772	$ 8,346	$ 2,574

Table 16 provides a breakout by both enrollment and poverty, in order to display the scale and poverty effects of the Augenblick and Myers recommendations. Note, for example, that low poverty districts gain, on average 2,441 per pupil. The highest poverty districts gain, on average 3,262 per pupil compared with current expenditures under SDF. The implication is that SDF does less well (falls further short or has a larger "suitability gap"), compared to the input standard of suitability, at funding higher poverty districts. Among low poverty districts, the "suitability gap" is largest for districts with 1,725 to 10,000 pupils. Under SDF, these districts are $2,659 below suitable funding. Among high poverty districts, the same group has the largest suitability gap, falling $3,687 per pupil below legislatively defined "suitable" funding.

[30] Federal revenues per pupil subtracted from current expenditures per pupil.

Table 16
Sample Simulation Output Comparing Current Expenditures per Pupil (Fiscal Survey of Local Governments 2000) with A&M Projected Revenues per Pupil by Enrollment and Poverty

Poverty Quintile	Enrollment Class	Current Expenditures under SDF in 2000	Average State and Local Revenue under A&M	Gain or Loss
A(Low)		$5,908	$8,349	$2,441
<=9%	A(<100) (N=1)	$9,333	$10,772	$1,439
	B(<300) (N=4)	$7,790	$10,342	$2,553
	C(<1000) (N=25)	$6,226	$8,611	$2,385
	D(<1725) (N=8)	$5,543	$8,078	$2,535
	E(<10000) (N=20)	$5,073	$7,771	$2,698
	F(>10000) (N=3)	$6,139	$7,267	$1,128
B		$6,296	$8,895	$2,599
10% to 13%	B(<300) (N=9)	$7,394	$10,151	$2,756
	C(<1000) (N=36)	$6,378	$8,870	$2,491
	D(<1725) (N=9)	$5,683	$8,342	$2,659
	E(<10000) (N=7)	$5,250	$8,120	$2,869
C		$6,538	$9,237	$2,699
13% to 16.5%	A(<100) (N=1)	$11,011	$10,961	-$50
	B(<300) (N=12)	$7,586	$10,245	$2,659
	C(<1000) (N=29)	$6,426	$9,210	$2,784
	D(<1725) (N=11)	$5,600	$8,540	$2,939
	E(<10000) (N=6)	$5,986	$8,573	$2,586
	F(>10000) (N=1)	$6,370	$7,861	$1,490
D		$6,499	$9,325	$2,826
16.6% to 20.2%	A(<100) (N=1)	$10,565	$12,458	$1,893
	B(<300) (N=12)	$7,765	$10,481	$2,717
	C(<1000) (N=30)	$6,395	$9,216	$2,821
	D(<1725) (N=7)	$6,063	$8,856	$2,793
	E(<10000) (N=9)	$5,257	$8,375	$3,117
	F(>10000) (N=2)	$5,541	$8,363	$2,822
E(High)		$6,640	$9,902	$3,262
>20.2%	A(<100) (N=5)	$9,408	$11,593	$2,185
	B(<300) (N=20)	$7,331	$10,652	$3,321
	C(<1000) (N=25)	$6,205	$9,543	$3,338
	D(<1725) (N=5)	$5,089	$8,647	$3,559
	E(<10000) (N=5)	$4,874	$8,561	$3,687
	F(>10000) (N=1)	$6,450	$8,379	$1,929
Grand Total		$6,376	$9,141	$2,765

Source: Output produced by Augenmyer4.xls

IV. CRITICAL FLAWS IN THE COST ADJUSTED BASE AID COMPONENT OF SDF

A. The Mis-measurement of Economies of Scale

Because this section focuses primarily on disentangling and re-estimating the economies of scale component of SDF, a primer on economies of scale in education is warranted. The notion of economies of scale is that industries, institutions or public agencies that produce lower quantities of output, generally have higher costs of production per unit of output. For public education systems, that means that school districts serving fewer students would be expected to have higher costs per student. Economies of scale in education can be viewed from either a **production** or **cost** perspective. From a production perspective, one might be interested in knowing the optimal school or district size for producing a given set of student outcomes. That is, in terms of production, there is both such thing as too large, and too small. In terms of cost, one might be interested in knowing the district size at which education costs of producing a specific level of outcomes are minimized.

As discussed at the outset of this report, and alluded to at many other points throughout, the economies of scale weight used in the Kansas School District Finance formula, is intended to serve as a "cost" adjustment. Somewhat consistent with cost function literature, that cost adjustment assumes that costs are minimized in districts near and above 2,000 pupils.[31] This alone, however is not basis for accepting the Kansas adjustment as rational.

Why do cost differences exist by school district size, or more precisely, what role does "size" or enrollment alone play in dictating district costs per pupil? It is important to distinguish, for example between costs related to the scale of operation, and costs related to the location and geography of operation. Population sparsity and scale are often related, especially in states with large rural areas. But, sparsity is different from scale. Population sparsity most directly affects the costs of providing transportation services. SDF accommodates transportation costs differences through a sparsity-based formula. As such, sparsity should not be confused with scale, and sparsity related costs should not be included in the state's scale adjustment.

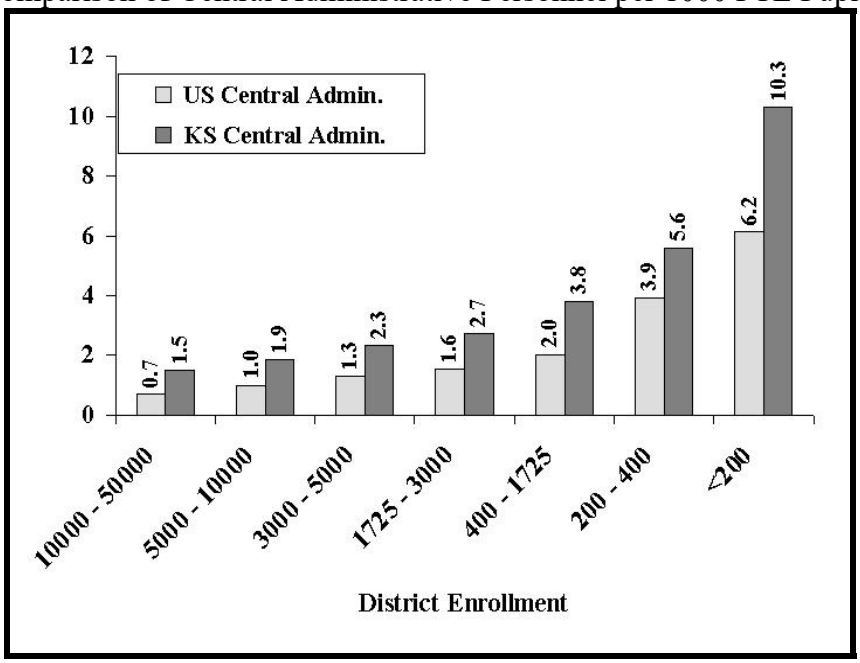
The majority of annual operating expenditures of public school districts are allocated to salaries and wages of school and district personnel. K-12 education is a personnel intensive service industry. It is generally accepted that smaller school districts will have higher staffing ratios to pupils for most types of staff. For example, Figure 11 shows that, on average, the nation's smallest school districts (<200 pupils) have over six times the number of central office administrators per 1,000 pupils. In Kansas, the smallest districts have nearly seven times the number of central office administrators. Numbers of central office administrators per pupil are increased when there are many small school districts, because there are simply more central offices – one per school district – with

[31] 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- 262.

minimal sharing of administrative support services. Where there are more administrators per 1,000 pupils there will, as a result, be higher operating costs per pupil.

An important question is whether these additional costs represent educational necessities – that is, the necessity for each small district to have its own central office – and are cost differences that should be accommodated by adjustments in state aid. Arguably, administrative services could be provided to Kansas school districts in any number of more efficient ways to reduce the overall administrative cost burden. As such, it is questionable whether central administrative cost differences should be accommodated by an economies of scale weight.

Figure 11
Comparison of Central Administrative Personnel per 1000 FTE Pupils

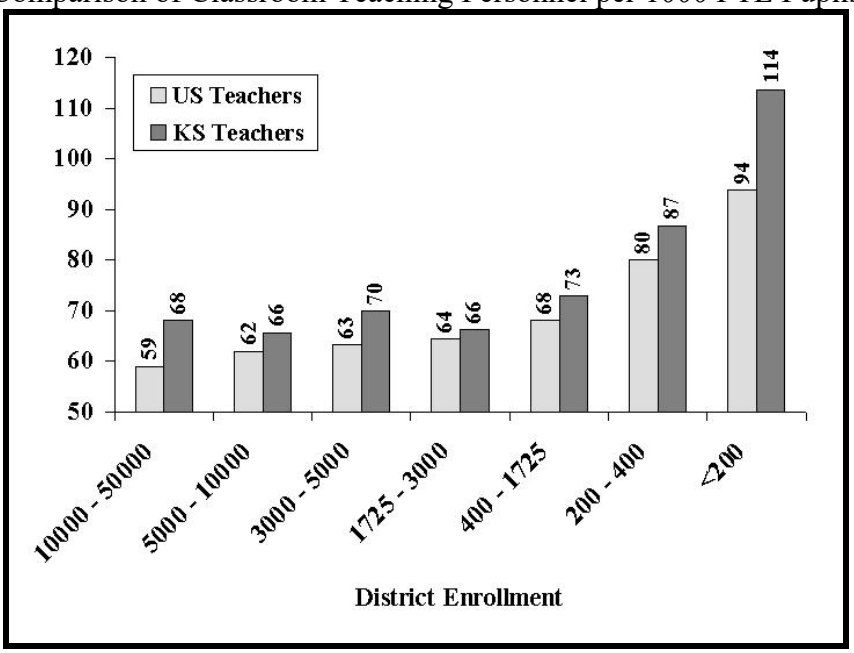


Data Source: NCES Common Core of Data (Local Education Agency Universe Survey), 1999

Figure 12 shows that smaller school districts in Kansas, and nationally also tend to have higher ratios of classroom teachers per 1,000 pupils. This occurs because in high schools especially, providing a variety of course offerings and having a balance of faculty expertise in math, science and English, necessarily results in smaller class sizes. Similar issues are true with respect to providing specific grade level attention to students in very small elementary schools. Where consolidation is infeasible because a small district is simply too remote to transport its students elsewhere, maintaining very small class sizes may be an educational necessity. Thus, it may be in the state's interest to provide additional financial support *in these specific cases*. However, it should be noted that the additional state aid in such cases is not providing for equal treatment, but rather, that state aid is providing for a justifiably different treatment. The difference in treatment is that the children in the smaller school district will have access to smaller class sizes and more

direct adult attention. Assuming that teacher quality does not suffer dramatically in smaller districts, students will be advantaged by this necessary unequal treatment.

Figure 12
Comparison of Classroom Teaching Personnel per 1000 FTE Pupils



Data Source: NCES Common Core of Data (Local Education Agency Universe Survey), 1999

Just as personnel costs per pupil increase when smaller numbers of pupils are served, so do facilities maintenance and operations costs. It should be noted that SDF provides two separate mechanisms for accommodating facilities maintenance, renovation and construction. One option for maintenance and smaller ongoing projects is the "capital outlay fund" (supported with local taxes). The state provides wealth-equalized support for bond and interest payments for larger projects that involve incurring long-term debt for financing. As such, the economies of scale weight on general fund expenditures should only include differences associated with annual operating expenses that cannot be drawn from capital outlay funds.

Adjusted Expenditure Function Approach for Re-evaluating Economies of Scale in Kansas in 1991 - 92

Problems with the economies of scale weight begin with the way in which the weight was determined. The weight was determined by taking the median general fund expenditures per pupil from 1991 – 1992 for districts with 75 to 125 pupils, 200 to 399 pupils and greater than 1,900 pupils. The sliding scale of pupil weights was then constructed by drawing two lines between the midpoints of those groups such that the district with 100 pupils would receive a weight of 2.14 and the district with 300 pupils

would receive a weight of 1.58 and the district with greater than 1900 pupils at the time would receive a base aid per pupil of $3,600 (with no weight applied, or 1.0).

Table 17 displays the median general fund expenditures per pupil of Kansas school districts in 1991, and also the median assessed valuation per pupil of those districts, under a school finance formula that (a) allowed for significant local control of school revenues and (b) included state policies differentially regulating the allowable growth of district budgets per pupil by district size. It is possible, if not likely that general fund expenditure differences by enrollment group were skewed by differences in property wealth as well as differences in allowable budget increases. In other words these expenditure differences don't accurately reflect differences in underlying costs of providing a given set of school resources and/or producing a given set of student outcomes.

Table 17
Data Underlying the Original "Cost" (Expenditure) Analysis

Enrollment	Median General Fund Expenditures per Pupil 1991 (ratio to >1,900)	Median Assessed Valuation per Pupil 1991 (ratio to >1,900)
75 – 125	$7,337 (214%)	$75,718 (325%)
200 – 400	$5,406 (158%)	$41,007 (176%)
> 1,900	$3,426	$23,292

This section applies an expenditure function approach to adjusting the Kansas economies of scale weight, based on 1991-92 data, as used in constructing the original weight. The idea of an "expenditure function" is to identify those factors that are associated with expenditure differences across districts. The major conceptual error made by those who constructed the original low enrollment weight is that education costs and education expenditures are not necessarily the same thing and further that education expenditures across school districts may vary for a variety of reasons, including, but not exclusively related to costs.

> **Costs per Pupil**: Costs per pupil vary across districts due to differences in student needs (required programs and services), the outcomes a district wishes to achieve with its students and structural and economic conditions of the district that are beyond the control of local boards and administrators.
>
> **Expenditures per Pupil:** When a state school finance system still involves a significant share of local control over revenue raising (as was the case under SDEA in 1991), expenditures per pupil vary across districts as a function of local voter choices regarding the quality of services they desire, and the taxes they are willing to support to pay for those services.

Local expenditures for public goods or services are one measure of local **demand** for a particular quality or quantity of good or service. Economists and political scientists most often characterize demand for local public goods and services in terms of the

median, or swing voter, in a model referred to as the *Median Voter Model*.[32] The median voter model assumes that the level of public good chosen by a group of voters will be a function of (a) the capacity of the median voter to pay for the good, usually measured as the income of the median voter, (b) the price, in taxes, that the median voter must pay for an additional unit of the public good and (c) the median voters preferences or tastes regarding the public good. Voters with higher income are expected to be able to pay more for public education services. Where tax prices are lower, voters are expected to purchase higher levels of the good. Finally, voters' utility or tastes for education will be a major influence on their choice to raise, or not raise taxes for education.

Typically, the income of the median voter varies from school district to school district, and communities with higher income voters will generally demand higher levels of education services. Holding price and tastes constant, this implies that income will be positively associated with education spending. Similarly, if voters in one community are able to pay a lower price for the same quality education, their children will be advantaged.

A well-designed scale weight should aid districts in accomplishing similar student outcomes, not different ones. However, the Kansas scale weight was based on expenditure data, where expenditure differences reflected local voters' demands for different student outcomes. As such, the Kansas scale weight simply codified those differences in voter demand.

Another distinction between education costs and expenditures is that a district may spend more than necessary to achieve a given set of outcomes. That is, a district may be inefficient, where inefficiency is the difference between what a district spends, and what it actually costs to achieve a given level of outcomes. Unfortunately, measuring relative efficiency of school districts remains a very inexact science (see Bifulco and Duncombe, 2002). However, research on causes of inefficiency has suggested that higher community wealth (income and/or property) and lower relative residential tax burdens may diminish external pressure from voters on school officials, thus reducing incentives to act efficiently."[33] If such patterns applied in Kansas in 1991, Kansas' very small districts which possessed relatively high property wealth per pupil may have been less efficient than their larger counterparts, leading to inflated estimates of relative costs for small districts.

The goal of this section is to re-estimate the effects of scale on district costs across Kansas school districts in 1991, while controlling for those differences in spending that were a function of differences in demand, rather than differences in cost. Two variables drawn from the literature on *median voter models* are used for measuring local voter demand – (1) median family income (1990) and (2) tax price. The tax price measure is a ratio of the median housing unit value (1990) to the assessed property value per pupil for each district.

For example, if the median voter owns a house worth $100k in a district with $100k in average assessed value per pupil, a 1% tax rate will cost the median voter

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[32] For an application of the median voter model, See Edward M. Gramlich and Daniel Rubinfeld (1982) Micro Estimates of Public Spending Demand Functions and Tests of the Tiebout and Median-Voter Hypotheses. Journal of Political Economy 90 (3) 536-560

[33] William Duncombe & John Yinger (1997) Why is it so hard to help central city schools? *Journal of Policy Analysis and Management* 16 (1): 85-113.

$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). Tax price measures are particularly useful for sorting out the influence of non-residential property values on local spending.

Table 18 presents a comparison of estimated scale effects using only enrollment (and enrollment squared) and then controlling for differences in district income and tax price. Coefficients on the enrollment variables are in bold. When only enrollment is used, the coefficient on the enrollment variable is -.697 (and on the enrollment squared variable is .038). A negative coefficient in this case indicates that larger districts spend less money, or that smaller districts spend more money. However, when controls for tax price and income differences are introduced, the scale effect is reduced.

Table 18
Analysis of the relationship between district enrollment and per pupil expenditures

Variable	**DV = 1991 GFPPE Without Controls for Income and Tax Price**	**DV = 1991 GFPPE With Controls for Income and Tax Price**
	Estimate	Estimate
Constant	11.34 ***	9.64 ***
Log of Enrollment	**-.697** ***	**-.561** ***
Log of Enrollment Squared	**.038** ***	**.030** ***
Log of Median Household Income		.116 ***
Log of Tax Price		-.062 ***
R-squared	.790	.817
Adj. R-squared	.788	.815

***p<.01

For example, school spending in a district with 100 students is predicted to be $7,600 on average. Using the model without controls for income and tax price, this spending level is predicted to drop by 45 percent if the district had 1,000 students. If the model with controls for income and tax price is used, the spending is expected to drop instead by 39%. In summary, what Table 1.14 means is that if the individual who constructed the low enrollment weight had appropriately considered the influence of local voters, their income and their property wealth, on spending differences in 1991, the economies of scale adjustment would have turned out smaller than the present weight.

Decomposition of 1991 Expenditures Approach

A second approach for analyzing and recalculating the economies of scale weight involves decomposing the necessary educational spending differences for districts of different size in 1991. For example, one might argue that central administrative costs could be consolidated, with central administrative functions managed in regional units, and to some extent by the state. That is, significantly higher central administrative cost

shares for smaller districts are not necessarily warranted, or at the very least, should not be *enabled* or *promoted* by additional state funding. This is especially appropriate given that the weight is based only on size, providing significant additional funding to even those small districts that neighbor much larger districts. As such, it would be reasonable to first subtract central administrative expenditures from 1991 general fund budgets per pupil prior to calculating the relative spending levels of different size districts. Because central administrative expenditures at the district level were unavailable for 1991, data on shares of budgets spent on central administration in 2000 were used to calculate dollars expended on central administration in 1991 (assuming shares held constant over time, which is likely a conservative assumption given increasing budgetary pressures and increased scrutiny on administrative expenses in Kansas districts).

It is also reasonable to subtract transportation expenditures, or that portion of general fund expenditures that were transferred to transportation funds prior to 1992. Removing general fund transfers to transportation is particularly important in the calculation of the economies of scale weight because a separate adjustment to accommodate transportation costs was included in SDF. That is, assuming that transportation expenses or even some portion of those expenses were included in the general fund expenditures in 1991 when the low enrollment weight was calculated, districts are now compensated twice for transportation related cost differences – once in the low enrollment weight, and again in the transportation weight. As with administrative expenses, the percent of general and supplemental funds transferred to transportation in 2000 was used to calculate a crude estimate of the amount that may have been transferred to transportation in 1991.

Table 19 displays the effects of the decomposition approach on the calculation of ratios for adjusting for economies of scale. Whereas the original analysis produced a ratio of 2.14 for the district with 100 pupils and 1.58 for the district with 300 pupils, the scale weight with both central administrative expenses and transportation transfers is reduced to 1.86 and 1.45.

Table 19
Economies of Scale Weight Adjusted by Decomposition

FTE	General Fund Expenditures per Pupil 1991		Less Central Admin		Less Transportation		Less Admin and Trans	
	Median	% of Base	Median	% of Base	Median	% of Base	Median	% of Base
75-125	7337	2.14	6244	1.94	6747	2.08	5857	1.86
200-399	5406	1.58	4842	1.51	4948	1.53	4553	1.45
>1900	3326		3217		3237		3142	

Combined Decomposition and Expenditure Function

An even more thorough approach to either statistically adjusting the low enrollment weight or using decomposition is to combine the two methods by first decomposing general fund expenditures, removing central administrative expenditures and transportation transfers, and then estimating the expenditure function controlling for income and tax price differences. This is necessary because differences in the general

fund expenditure levels after subtracting administrative and transportation costs were likely influenced by each community's ability to pay for things like smaller class sizes, or more highly qualified teachers.

Table 20 applies the combined decomposition and expenditure function approach. While the coefficient between district enrollment and general fund expenditures was originally -.697, reduced to -.561 when controlling for income and tax price differences, that coefficient is further reduced to -.505 when controlling for income and tax price differences and removing administrative and transportation expenses.

Table 20
Combined Decomposition and Expenditure Function Re-Analysis of Economies of Scale in 1991

Independent Variable	DV = Log of GFPPE 91		DV = Log of GFPPE less Central Admin		DV = Log of GFPPE less Trans		DV = Log of GFPPE less Central Admin & Trans	
	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.
ln of Enroll	**-.561**	***	**-.492**	***	**-.578**	***	**-.505**	***
ln of Enroll Squared	**.030**	***	**.026**	***	**.031**	***	**-.028**	***
ln of Median Family Income	.116	***	.114	***	.113	***	.112	***
ln of Tax Price	-.062	***	-.064	***	-.060	***	-.062	***
Constant	9.64	***	9.30	***	9.66	***	9.29	***
R-Squared	.817		.773		.798		.747	
Adj. R-Squared	.815		.769		.795		.743	

***p<.01

Figure 13 displays the effects on the resultant economies of scale weight of applying each of these adjustments. The current low enrollment weight sliding scale is sketched into the chart in red (leveling off at a minimum of about 6%, or the current correlation weight), revealing additional distortions created by the oversimplified use of too few linear segments rather than a curve. Most notably, a large number of districts with between 300 and 1,725 students get a substantial boost in low enrollment weight even relative to the unadjusted economies of scale weight. Referring back to Figure 2 of this report, this finding may partially explain why this group of districts in particular has used the least of its potential local option budget leverage.

Figure 13

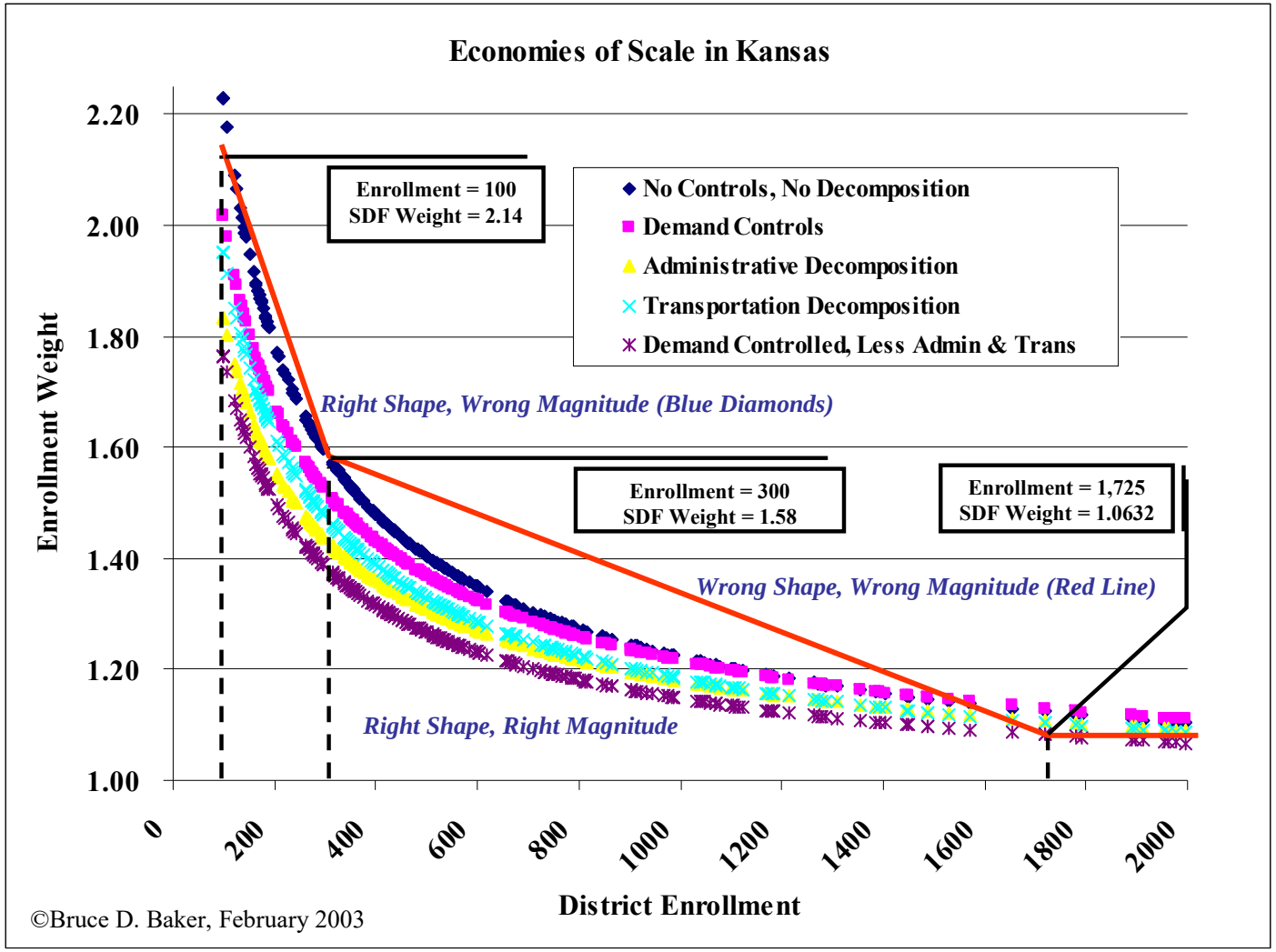

Economies of Scale in Kansas
Enrollment Weight
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0
200
400
600
800
1000
1200
1400
1600
1800
2000
District Enrollment
Enrollment = 100
SDF Weight = 2.14
Enrollment = 300
SDF Weight = 1.58
Enrollment = 1,725
SDF Weight = 1.0632
No Controls, No Decomposition
Demand Controls
Administrative Decomposition
Transportation Decomposition
Demand Controlled, Less Admin & Trans
Right Shape, Wrong Magnitude (Blue Diamonds)
Wrong Shape, Wrong Magnitude (Red Line)
Right Shape, Right Magnitude
©Bruce D. Baker, February 2003

Table 21 summarizes the weights from Figure 13. Note that with each additional adjustment, as is visually apparent in Figure 13, weights for the smallest districts relative to the largest are reduced. Note that **Wgt1** represents the curved line fit to the original 1991 data, without controls for income and tax price and without decomposition. As such **Wgt1** represents what the enrollment weight would look like had they simply implemented it as a curve rather than linear segments. This weight specifically reveals the distortion created by the linear adjustment applied for districts with 300 to 1725 pupils.

Table 21
Weights Represented in Figure 13

Group	SDF	Curve Fit, No Controls (wgt1)	Demand Controls (wgt2)	Less Admin. (wgt3)	Less Trans (wgt3)	Combined (wgt4)
75 to 125	2.12	2.20	1.99	1.82	1.93	**1.75**
200 to 400	1.62	1.59	1.52	1.44	1.48	**1.39**
400 to 600	1.51	1.41	1.38	1.31	1.33	**1.27**
600 to 1000	1.41	1.28	1.27	1.22	1.23	**1.19**
1000 to 1400	1.27	1.19	1.19	1.16	1.16	**1.13**
1400 to 1800	1.13	1.14	1.14	1.12	1.11	**1.09**
>1725	1.06	1.05	1.06	1.05	1.05	**1.04**

Un-weighted means for districts in each enrollment group, district unit of analysis

Professional Judgment "Input Standard of Suitability" Findings

Finally, the previously discussed report commissioned by the Kansas legislature included analyses of the costs of providing "suitable" education programs in districts of different size. Table 22 displays the effects of the scale component of the Augenblick and Myers recommendations. At a base state aid of $4,650 the median revenue per pupil of districts with 75 to 125 pupils would be 7536, or 1.43 times the median for districts enrolling greater than 1,900 students, and the median revenue per pupil of districts with 200 to 400 pupils would be 1.24 times the larger district median, or $6,524.

Table 22
A&M Scale Component Using Base of $4,650 (2000 – 2001 data)

Enrollment	Budget per Pupil (Scale Adjustment Only)
75-125	7536 (1.43)
200 - 400	6524 (1.24)
1900	5,257
>11,200	4,650

Source: Produced with Augenmyer4.xls

Comparison of Scale Weights

Figure 14 compares the economies of scale ratios, as "pupil weights," generated by Augenblick and Myers input based analyses with the combined demand controlled and decomposed weight from Figure 13 and Table 21, along side the present Kansas economies of scale weight set to a minimum of 6.032% (correlation weight). The Augenblick and Myers weight appears to have the smallest overall range but is similar for small districts to the curve generated by my own scale analyses. The Low Enrollment Weight in SDF is especially much steeper for districts with 300 to 1,725 pupils.

Figure 15 applies the weights to alternative base aid figures, including Augenblick and Myers arbitrary recommendation of $4,650 and their empirically based $5,811. Applying the weights to the $4,650 base essentially holds the smallest districts harmless, and gives a substantial boost in funding to the larger districts. The largest districts (not accounting for poverty) get a slightly smaller boost with my weight than with Augenblick and Myers scale weight. Applying the weights to the $5,811 base, all districts get a boost, but the largest districts get a substantial boost, again, accounting only for size, not poverty.

Figure 14

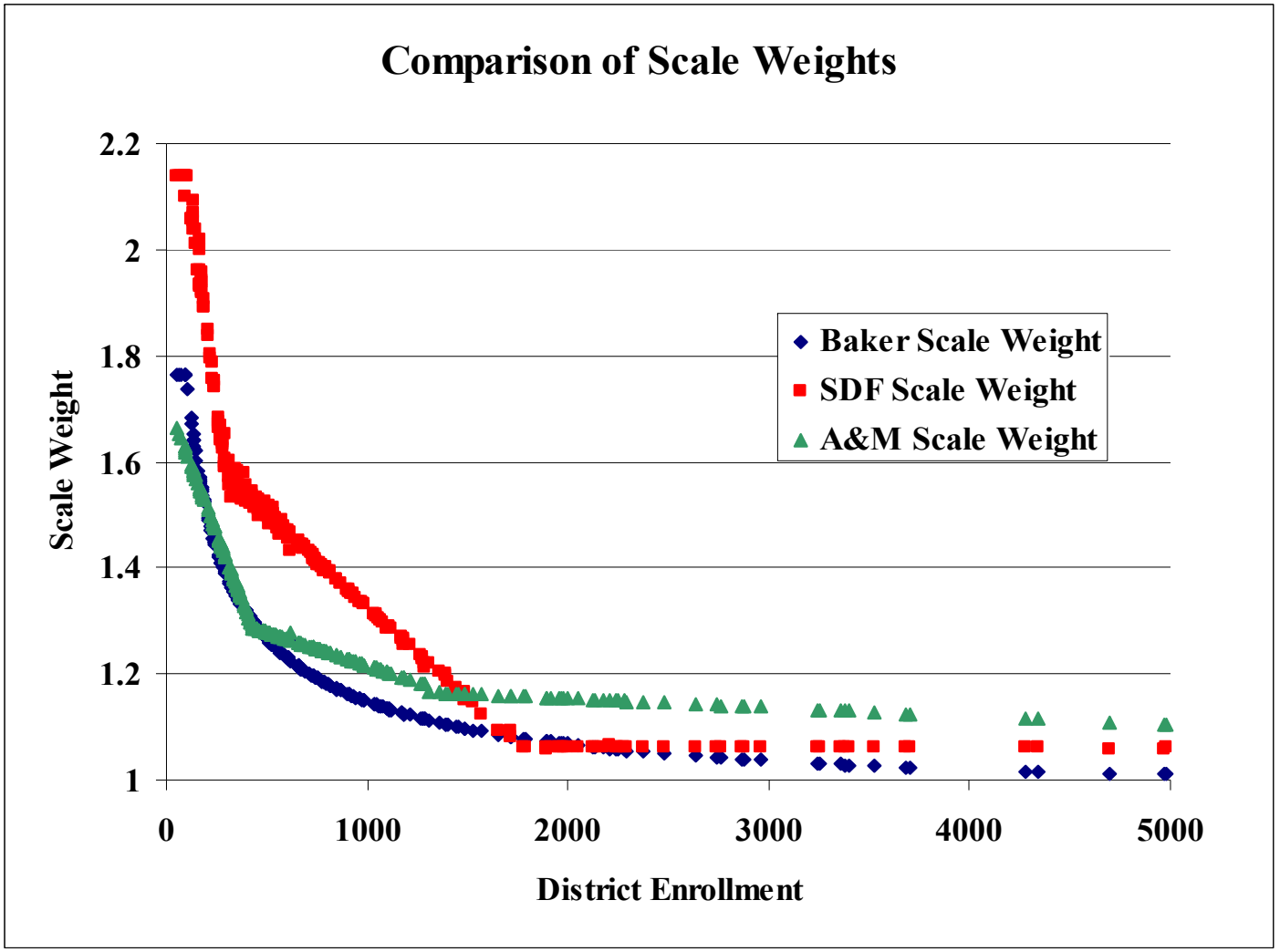
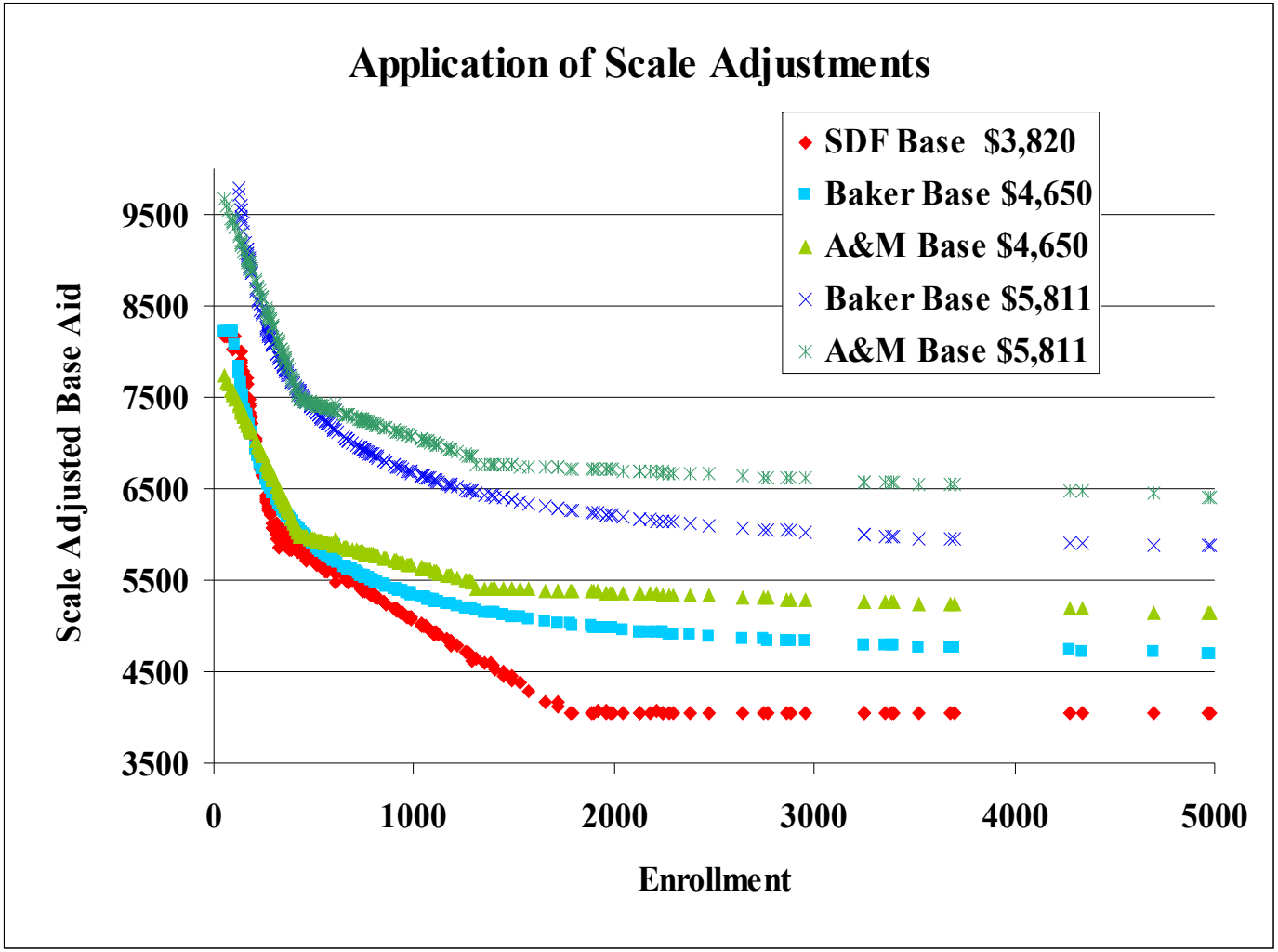

Comparison of Scale Weights
Scale Weight
2.2
2
1.8
1.6
1.4
1.2
1
0
1000
2000
3000
4000
5000
District Enrollment
Baker Scale Weight
SDF Scale Weight
A&M Scale Weight

Figure 15


Application of Scale Adjustments
SDF Base $3,820
Baker Base $4,650
A&M Base $4,650
Baker Base $5,811
A&M Base $5,811
Scale Adjusted Base Aid
9500
8500
7500
6500
5500
4500
3500
0
1000
2000
3000
4000
5000
Enrollment

B. Arbitrary and Inadequate Compensation for Students' Needs

In this section, I address the SDF adjustments for at risk and LEP pupils. I begin with a brief review of empirical literature on the costs of serving at risk and LEP pupils. Next, I review the at risk and bilingual education weights proposed in the Augenblick and Myers funding formula recommendations along side current SDF at risk and bilingual education weights.

Literature on Cost of Services for At Risk & LEP Students

Cost estimates and/or guidelines for achieving vertical equity for at-risk and limited English proficient pupils have been presented in literature and used in policy for several years, despite questionable empirical bases. The most common estimates provided indicate a cost of serving both at-risk and limited English proficient pupils at 1.2, or 120% of the cost of educating the "typical" student.[34] A recent National Research Council report noted the following with respect to the 1.2 weighting for at-risk pupils: "While this indicator may be the best currently available for determining a weighting for students in poverty and is easily understood, it results from federal budget decisions about what to spend on Title I, not on a calculation of the costs of education poor children and of compensating for prior deprivation that may affect their education performance."[35]

Three approaches have been used in the literature for estimating costs of serving at-risk pupils. As noted above, commonly used early estimates relied on analysis of federal Title I (or Chapter I) expenditures. A handful of recent studies use cost functions to estimate the costs of achieving adequate outcomes in schools with varied percentages of low-income pupils. Other recent studies estimate the costs of implementing whole school reform models in prototypical schools, using simplified resource cost models.

Results of cost and expenditure analyses of serving at-risk pupils vary widely. Goertz (1988), for example, found that in a study of schools in 17 districts, Chapter I expenditures ranged from $175 per pupil in a district with an expenditure range of $175 to $1,070, to $2,500 per pupil.[36] Odden and Picus (2000) cost out the ingredients of offering the Roots and Wings/Success for All, whole school reform program focused on improving achievement of at-risk pupils in a school of 500 pupils, arriving at approximately $1,000 per pupil or $500k.[37]

Cost function analyses tend to yield substantially greater marginal costs.[38] In particular, Reschovsky and Imazeki's models of Wisconsin school districts suggest a supplemental poverty weight of 1.59 (or 259% of mean spending) indicating that "to achieve any given level of educational outcome costs two and a half times as much

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[34] Parrish, T.B., Matsumoto, C.S., Fowler, W.J. (1995) Disparities in Public School District Spending 1989-90: A multivariate, student-weighted analysis, adjusted for differences in geographic cost of living and student need. Washington, DC: National Center for Education Statistics (NCES 95-300R).

[35] Ladd, H.F., Hansen, J.S. (1999) (Eds.) Making Money Matter: Financing America's Schools (Washington, DC: National Academy Press)

[36] Allan Odden and Lawrence Picus (2000) School Finance: A Policy Perspective. McGraw-Hill, NY. p. 212

[37] Odden and Picus, 2000, p. 213

[38] Reschovsky & Imazeki, 2001, 1998; Downes & Pogue, 1994.

money as required to educate a regular education student."[39] Similarly, Downes and Pogue (1994) in an analysis of Arizona schools, note that "for the decile of districts with the smallest concentration of at-risk students, this (additional cost of achieving comparable outcomes) cost is $73 per student or less; for the decile with the greatest concentration, the cost is $2,632 or more."[40] Duncombe (2002) finds the additional costs per free lunch student in New York State to range from just below 100% (2 times resource levels required to produce average outcomes with the average student) in low need districts to nearly 130% in high need districts.[41]

Studies of the costs of providing bilingual education have also produced widely varying results, ranging from less than an extra 5% (Carpenter-Huffman and Samulon, 1981; Gonzalez, 1996) to an extra 100% (Chambers and Parrish, 1983) (in Odden and Picus, 2000, 214). Parrish (1994) estimated the costs of serving limited English proficient students under alternative instructional models in California.[42] Using a "resource cost model" (RCM) approach, Parrish (1994) found the average total marginal cost of serving LEP students to be $361 (marginal instructional cost = $186, admin and support cost $175). Across four approaches to service delivery, marginal costs were approximately 18% above classroom costs with classroom costs ranging from $1,409 to $1,978 per pupil and total costs, including support for LEP students ranging from $1,756 to $3,505 per pupil. Parrish and Hikido (1998) note that the $361 marginal cost is only 8% above average expenditures per pupil in California, which at the time were $4,598.[43] Via cost function analysis, Duncombe (2002) finds the additional cost of serving a LEP student to exceed 100% (2 times) average expenditure levels.

Comparison of Current Law with Augenblick & Myers Weights for At Risk Children

Table 23 compares the at risk/poverty weight component of the Augenblick and Myers recommendations with present SDF funding. Augenblick and Myers weights for bilingual education programs are addressed in Section 2.0 of this report. Under SDF, a weight of 10% is applied uniformly to the base state aid per pupil, which, for example, was $3,820 in 2000 – 2001. Note that under SDF, an at risk child in a larger district in Kansas has available to him/her, approximately $2,000 less per pupil than in a smaller district, taking the sum of at risk aid and general educational funds (general fund budget per pupil). To the contrary, based on input based cost analyses, Augenblick and Myers found the total costs from small to large district to be quite similar, and the marginal costs to be much higher for larger districts.

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[39] Reschovsky & Imazeki, 1998, p. 143

[40] Downes and Pogue (1994) p. 103

[41] William Duncombe (2002) Estimating the Cost of an Adequate Education in New York. Center for Policy Research. Working Paper #44.

[42] Parrish, T.B. (1994) A Cost Analysis of Alternative Instructional Models for Limited English Proficient Students in California. Journal of Education Finance. 19 (3) 256-278.

[43] Thomas Parrish and Christine Hikido (1998) Inequalities in Public School District Revenues: Statistical Analysis Report. Office of Educational Research and Improvement, National Center for Education Statistics (Washington, DC: U.S. Department of Education). NCES 98 – 210.

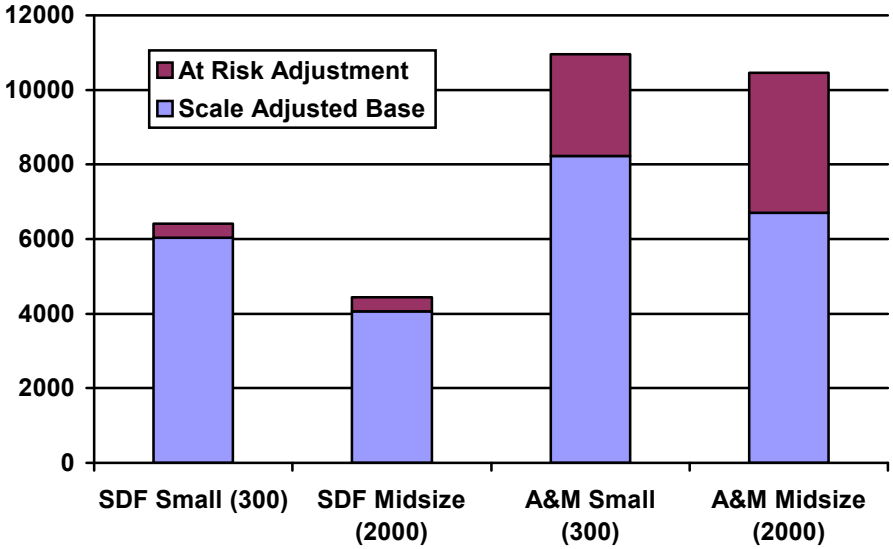
Three features of the Augenblick and Myers weights are different from those in SDF. First, the weights are applied to the scale adjusted base aid, rather than a single flat base aid across districts. Second, the weights increase in size moving from smaller to larger districts (but are multiplied times a smaller base). Finally, the weights are much larger than 10%, and for all district sizes they are multiplied times a base much larger than $3,820.

Table 23
Comparison of Augenblick and Myers At Risk Weight with SDF At Risk Weight

District Size	Component	SDF	A&M
Small District (300)	Base with Low Enrollment	$3,820 x 1.58 = $6,036	$8,235
	At Risk per Pupil	**.10** x $3,820 = $382	**.33** x $8,235 = $2,718
	Total for At Risk Child	**$6,418**	**$10,953**
Large District (2000)	Base with Low Enrollment	$3,820 x 1.0632 = $4,061	$6,702
	At Risk per Pupil	**.10** x $3,820 = $382	**.56** x $6,702 = $3,753
	Total for At Risk Child	**$4,443**	**$10,455**

Figure 16 is a graphic portrayal of the comparisons made in Table 23.

Figure 16
Comparison of Current (SDF) and Augenblick and Myers At Risk Weights



Comparison of Current Law with Augenblick and Myers Weights for LEP Children

Because Kansas uses a contact hour count method, assume that a small and a large Kansas district each serve 1 LEP child and that each child requires a full 6 contact hours, meaning that each district has 1 FTE bilingual education student (note that this scenario is unlikely. Rather, it would take multiple LEP students, each receiving some contact time to yield 1FTE. For example, in 2000 Kansas City reported 1,938 LEP pupils and in 2002, they reported 6,897 contact hours. Dividing the contact hours by 6 yields 1,149 fundable FTE pupils, or 59% of the LEP count. For Wichita, that figure was 71% and for Shawnee Mission, that figure was only 22%). Assume that the smaller district, with 300 pupils has a scale adjusted base aid per pupil of $6,104 and the larger district, with 5,000 pupils has a scale adjusted base aid per pupil of $4,107 (assume all else is equal among these districts). In the small district, the total available resources for the LEP child would be $6,877, while in the larger district, the total available resources would by $4,880 (only 71% of the funds available to the other child) Note that the effects are similar if the example were to involve 6 LEP children, each receiving 1 contact hour.

District A:

Enrollment	= 300
Low Enrollment Weight	=1.58
Base Aid per Pupil	=$3,863
General Instructional Revenue per Pupil	=$6,104
Bilingual Education Aid per 1 FTE	=$773
Total Resources per 1 FTE	**=$6,877**

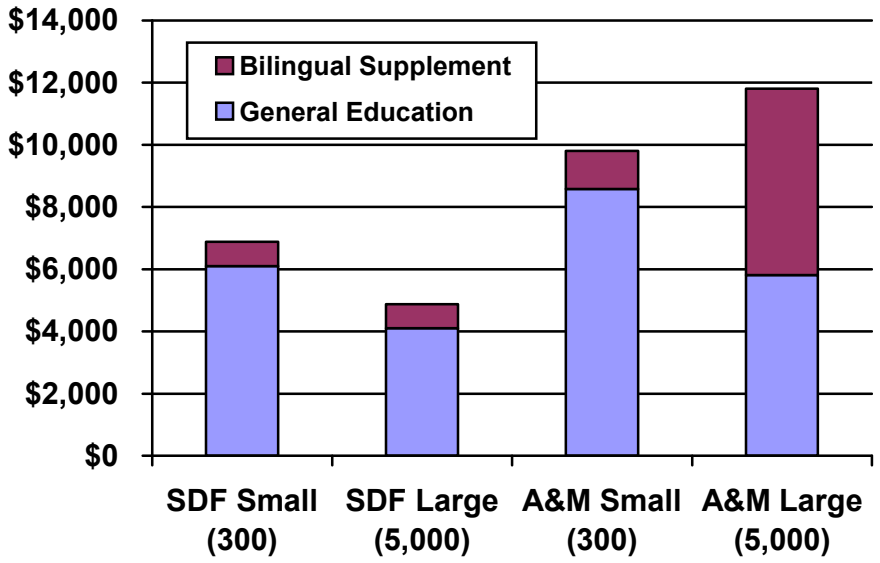
District B:

Enrollment	= 5000
Low Enrollment Weight	=1.0632

Base Aid per Pupil	=$3,863
General Instructional Revenue per Pupil	=$4,107
Bilingual Education Aid per 1 FTE	=$773
Total Resources per 1 FTE	**=$4,880**

Note that there is no evidence to which I have been privy to suggest that at any point in time empirical analyses were conducted to validate that the total cost of educating 1 FTE LEP pupil in small districts was nearly $2,000 higher than in larger districts. To the contrary, Augenblick and Myers found the base cost in a "very small" district to be $8,581 and bilingual cost per FTE to be $1,217, for a total cost of $9,798 and the base cost in a large district to be $5,811 with a cost per bilingual FTE of $5,993, for a total cost of $11,804 (a $2,000 per pupil difference, but in the opposite direction). Figure 17 compares current bilingual education funding with "suitable" funding estimated by Augenblick and Myers (See Table IV – 10 of A&M report for cost estimates used herein).

Figure 17
Comparison of Total Revenues per pupil Available to LEP Children Under SDF and A&M Professional Judgment Findings



C. The Politically Motivated and Manipulatively Crafted New Facilities Weight

The Kansas New Facilities Weighting is defined as follows in current law (SDF):

> **''School facilities weighting'' means an added component assigned to enrollment of districts on the basis of costs attributable to commencing operation of new school facilities.** School facilities weighting may be assigned to enrollment of a district only if the district has adopted a local option budget and budgeted therein the total amount authorized for the school year. **School facilities weighting may be assigned to enrollment of the district only in the school**

year in which operation of a new school facility is commenced and in the next succeeding school year.

The cumulative effect of the weight in 2000 – 2001 was an added 7,482 weighted pupils (7.04% of total weighted pupils) and 28.6 million dollars to districts with pupils in new facilities.

The legislative purpose of the new facilities weight was to help districts meet the costs of opening new facilities. The legislature decided that rather than putting the additional funding into support for paying off bonded indebtedness using the current property wealth-equalized sliding scale for bond and interest payments, that new facilities aid should be available to districts that had already been able to construct new facilities through bonded indebtedness paid for primarily by local taxpayers. Further, it was assumed that local districts should be required to raise their own taxes to support new facilities operations before it would become a state responsibility to help them out. Once a district had reached its maximum possible annual operating budget, the state would provide new facilities weights, which would have the effect of (1) increasing the districts base operating budget per pupil and (2) increase the district's opportunity to raise supplemental funds through local option taxes, because the cap on supplemental funds is proportionate to base funds.

The explicit and implicit stipulations regarding the connection between new facilities aid and spending choices of local voters make it logical to expect, before even implementing such a policy, that districts with higher income families would be more likely to receive that aid. The implicit stipulation of new facilities aid is that the local community must first have voted to build a new school, primarily through local tax support. The explicit stipulation is that they must then have also voted to spend the maximum possible amount in local taxes for annual operating budgets. This combination of events is certainly most likely to occur in higher income districts, especially at the time the weight was implemented.

Table 14 of this report indicated that median family income remains highly associated with the size of districts' local option budgets. Table 24 includes a series of simple tests that validate (a) higher median family income and lower tax price are positively associated with the likelihood of maximizing local option budgets, and (b) that new facilities weight, and resultant new facilities aid per pupil are highly related to median family income. Specifically, Table 24 indicates that districts with $10,000 higher median family income are more than 2.52 times as likely to have maximized their local option budgets. Further, districts with lower tax price are more likely to have maximized their local option budgets. Next, in a strikingly strong relationship of substantial magnitude, districts with $10,000 higher median family income receive, on average, $104 more per pupil in new facilities and ancillary new facilities weighting. Note that income and tax price alone explain nearly 60% of the variance in new facilities aid. This is a logical result of tying that aid to local ability to both maximize local option budget mill levies, while facing increased LOB taxes, to pass bond issues for new facilities.

Table 24
Relationship between key variables underlying new facilities (and ancillary new facilities) weighting

	Logit Regression of "LOB Maximization		Linear Regression of New Facilities Aid per Pupil	
	Odds Ratio	Sig.	Coefficient	Sig.
Tax Price	.003	*	-415.7	*
Median Family Income (10,000s)	2.52	*	103.9	*
R-squared	(Pseudo R-squared) .139		.572	

*p<.01

Stipulations that accompanied adoption of new facilities weight strongly suggest that the new facilities weighting was passed to benefit specific school districts, raising equal protection concerns. Even if there were a rational basis for assuming higher costs per pupil during the start up years of a new facility, it is difficult if not impossible to conceive of a rational basis for restricting the availability of that aid to higher income districts. Arguably, the new facilities weighting was implemented in part, to appease Blue Valley USD 229, a litigant in the 1993 challenge to the School District Finance Act. Blue Valley and its neighbor Olathe USD 233 were experiencing significant enrollment growth and building new schools on an annual basis. Adding the new facilities weight, with the stipulations that districts must have maximized their local option budgets guaranteed that Blue Valley and Olathe would be the primary recipients of new facilities aid. For example, in 1995, Blue Valley and Olathe received 64% of all new facilities aid, and with their neighbor Shawnee Mission (discussed in the previous example), the three received 82% of all new facilities aid. Only three other districts received new facilities aid in 1995. A temporary measure which explicitly provided an increased weight of .33 (instead of .25) for Blue Valley and Olathe for school year 1996 – 97 is further evidence that the new facilities weight was passed to specifically benefit Blue Valley and Olathe.

D. Illogical Aggregate Effects of the Pupil Weighting System

In this section, I briefly reflect back on the first section of this report, in which I explain the design of "rational" cost adjusted two tiered formulas, and raise significant concerns regarding the "aggregate effects" of the pupil weighting system in SDF. Recall that the premise of a "cost adjusted" aid formula is to provide districts comparable opportunities to achieve a desired set of outcomes. Assuming we apply an input standard in place of the outcome standard, "cost adjustments" should still be based on achieving some goal, and those cost adjustments, in the aggregate, should reflect that goal.

Table 25 shows the aggregate effects of the pupil weighting system for a sample of districts in the Kansas City metropolitan area. Table 25 shows that in the Kansas City metropolitan area, high income districts like Blue Valley receive more aid per pupil from cost adjustments (see the weighting ratio column) than high student need, high poverty districts like Kansas City. If we were to try to interpret the "cost basis" of the pupil weighting scheme in SDF, we would be led to believe that:

"it costs more per pupil to achieve desired outcomes with high socio-economic status children in brand new facilities (with higher quality and lower cost lighting, heating and cooling etc.) than to achieve those outcomes with low socio-economic status and limited English proficient children in older, in some cases dilapidated, inefficient facilities (with more costly mechanical systems to operate etc.)."[44]

This is obviously an absurd assumption, and with little question, indicative that the collection of "cost adjustments" that make up the first tier of SDF are "wide of any reasonable mark." **One might go so far as to say that this assumption, directly derived from the design of SDF, is in direct conflict with "plain common sense!"**

One reason for providing this example for a specific metropolitan area is that the pupil weighting scheme of SDF has significant consequences for school districts that compete for teachers within the same regional labor market. Recall that districts with more pupils with special educational needs will require greater intensity of resources, where those resources are ideally of similar quality to those accessible to children with fewer special needs. That is, children from economically deprived backgrounds and children who enter school speaking English poorly, concentrated in districts like Kansas City, need more teacher/child contact with comparably if not better prepared teachers, than better prepared, children from higher income families in Blue Valley. Yet, Blue Valley is provided more base funding per pupil that may be allocated for teacher salaries. This would conceivably allow Blue Valley to purchase either more teachers (have higher intensity, despite lower need), or purchase higher quality teachers than Kansas City. Further, this assumes that even with the same revenues, Kansas City could recruit teachers with comparable qualifications to those in Blue Valley. Additional analyses of teacher labor market issues are included in Section VI.

[44] Note that architectural firms involved in school construction indicate that a mechanical systems in a building constructed in the year 2000 typically cost 10% less in annual operations than mechanical systems in buildings constructed as recently as 1990.

Table 25
SDF makes no significant adjustment among large districts to accommodate socio-economic differences (FYlegalmax03)

Name	Median Family Income	Median Housing Unit Value	Percent HS Graduate	Percent BA Graduate	Adjusted FTE Enrollment	Base Aid per Pupil (General Fund)	General Fund Weighting Ratio[(1)]	General Fund per Pupil
Piper/KC	$67,822	$123,600	91%	23%	1,266.30	$3,863	1.31	$5,061
Blue Valley	$90,709	$229,600	98%	64%	17,129.50	$3,863	1.29	$4,983
Desoto	$69,517	$160,900	94%	40%	3,473.10	$3,863	1.26	$4,867
Turner/KC	$40,155	$61,800	79%	9%	3,432.80	$3,863	1.23	$4,751
Spring Hill	$58,860	$130,200	90%	23%	1,483.40	$3,863	1.23	$4,751
Kansas City	$30,845	$47,800	72%	12%	19,808.10	$3,863	1.20	$4,636
Bonner Springs	$44,012	$77,600	81%	16%	2,175.80	$3,863	1.19	$4,597
Gardner-Edgerton	$52,059	$111,500	90%	20%	2,944.00	$3,863	1.17	$4,520
Olathe	$62,633	$143,400	94%	43%	20,312.00	$3,863	1.17	$4,520
Shawnee Mission	$54,383	$136,700	95%	47%	29,677.40	$3,863	1.13	$4,365

1) calculated by dividing weighted pupil count '03 (excluding special education) by Fall 2002 enrollment (excluding 4yr at risk and declining enrollment adjustment)

Referring back to the output of an empirically justifiable cost based first tier in Table 4 of this report, a very low poverty rural district in Texas with 650 students would receive a median centered cost index of 1.12 (1.27 if based on a minimum of 1.0) and a high poverty (26%) urban fringe of a large city in Texas would receive a 1.02 cost index (1.16 if based on a minimum of 1.0). That is, the small rural district would receive in cost adjustments, about 11% more than the poor urban fringe district. Again, other cost function studies show stronger poverty effects than this version of the Texas index used in Table 4.

That said, a low poverty rural district in Kansas of the same size as the low poverty rural Texas prototype, receives the equivalent of a weight of 1.68[45] while Kansas City, a near equivalent in size and poverty to the high poverty urban fringe Texas prototype, receives only 1.33. That is, in Kansas, the low poverty rural district receives not 10% or 11% more than the high poverty urban fringe, but 35% more. **Plain common sense suggests that something is *askew* in the Kansas School District Finance Act and that present cost adjustments are severely lacking when it comes to "rational educational explanation."**

[45] For Kansas weights to be comparable to the Texas index, special education funding must be added in as a weighted pupil count (as done for re-estimation of LOB authority), and transportation weight must be excluded. The average weighting ratio (2002 – 03 weighted FTE divided by Fall '02 enrollment) for a rural district of 650 pupils with very low poverty was determined by taking the average general fund weight of low poverty Kansas districts with 600 to 700 pupils.

V. FAILURE OF SDF/QPA TO GUARANTEE SUITABLE OPPORTUNITIES TO CHILDREN

The duty owed by the Kansas legislature to make suitable provision for the funding of public schools is a duty owed to none other than each individual child eligible for public schooling in the state of Kansas. Where outcome standards are applied, assuming Kansas state assessments to represent the state's preferred measure of outcomes, then the duty of the legislature is to fund schools to such a level that children, regardless of the district they attend, the neighborhood in which they live, the income of their parents or color of their skin, are provided comparable opportunity to succeed on state assessments. Where input standards are applied, the duty of the legislature is to insure that all students have the opportunity to attend schools that have financial resources sufficient to provide resources determined by the legislature and board of education to be suitable.

State accountability systems, coupled with state tests ranging from performance assessments to standardized academic achievement tests, to high stakes exit exams, have become increasingly popular mechanisms for "guaranteeing" specific, measurable educational opportunities to children. A recent study by Carnoy and Loeb (2003) indicated that all but 2 states (Iowa and Nebraska) had some form of accountability system, though those systems varied widely in strength.[46] This section begins with a summary of Carnoy and Loeb's major findings regarding the effectiveness of accountability systems. Next, I address related literature by Hanushek and Raymond regarding the usefulness and meaningfulness of alternative measures of student outcomes in accountability systems. Next, I address conceptually where Kansas' Quality Performance Accreditation Act and the Kansas State Assessments fit into the larger picture of what's know about "effective accountability systems." Next, I study various student outcomes and trends in student outcomes for Kansas school districts to discern the effectiveness of QPA for guaranteeing opportunities to individual Kansas school children. This section raises serious concerns about the effectiveness of QPA as an accountability tool, usefulness of the Kansas State Assessments as a school-based performance indicator system, and meaningfulness of "performance indicators" like "standards of excellence" used by the Kansas state board of education.

A. Importance of Accountability Systems

In short, recent research finds significant positive effects on student outcomes of strong accountability systems. In a recent, multi-state analysis of the effects of state accountability systems on student outcomes, Carnoy and Loeb (2003) constructed an index of the strength of state accountability system, ranging from "0" for no accountability to "5" for strong accountability, and tested the relationship between accountability system strength, and student outcomes. In general, Carnoy and Loeb

[46] Martin Carnoy and Susanna Loeb (2003) Does External Accountability Affect Student Outcomes? A Cross-State Analysis. Educational Evaluation and Policy Analysis 24 (2) 305-332.

found that states having strong accountability systems are reaping significant benefits in terms of student outcomes. In particular, Carnoy and Loeb found:

- "Our results indicate a positive and significant relationship between the strength of accountability systems and math achievement gains at the 8th-grade level across racial/ethnic groups." (p. 320)

- "The 8th grade achievement gains associated with stronger accountability are large. A two-step increase in the accountability scale corresponds to approximately one half a standard deviation higher gain in the percent of students that achieve at least the basic level; and the effect sizes for gains at the proficiency level are even higher."

- "states with stronger accountability saw significantly greater gains in the percent of 4th grade Black students that achieved at least the basic level on the math NAEP (more than a third of a standard deviation increase associated with a two-step increase in accountability; and marginally significant greater gains in the percent of 4th grade Hispanic students that achieved at least the basic level on the math NAEP (approximately a quarter of a standard deviation increase associated with a two-step increase in accountability).

Hanushek and Raymond (2002) also find that the strength of state accountability systems is associated with improved student performance on the National Assessment of Educational Progress (NAEP).[47] In particular, they find:

> "The typical student in a state without an accountability system of any form would see a 0.7 percent increase in proficiency scores. States with "report card" systems display test performance and other factors but neither provide any simple aggregation and judgment of performance nor attach sanctions and rewards. In many ways, these systems serve simply as a public disclosure function. Just this reporting moves the expected gain to 1.2 percent. Finally, states that provide explicit scores for schools and that attach sanctions and rewards (what we call "accountability" systems) obtained a 1.6 percent increase in mathematics performance. In short, testing and accountability as practiced have led to gains over that expected without formal systems." (p. 3)

B. Where Does QPA Fit in as an Accountability System?

Accountability systems can take many shapes or forms. Accountability can focus on individual student performance, and be based on students having to pass "high stakes" exams in order to graduate with a legitimate high school diploma. High stakes exams may also be introduced a lower grade levels to determine whether students may advance

[47] Eric A. Hanushek and Margaret E. Raymond, "Improving Educational Quality: How Best to Evaluate Our Schools?," Education in the 21st Century: Meeting the Challenges of a Changing World (2002). The results pool data on NAEP math gains over both the 1992-96 and 1996-2000 period.

to the next grade. Some recent evidence points to the positive effects of such exams on student achievement.[48] Systems of this type explicitly focus on the opportunities guaranteed to the child, as measured by their outcomes.

Alternatively, accountability systems may focus on ensuring that quality schools exist and are broadly and equitably available. School-based accountability or accreditation systems provide a framework and set of indicators for evaluating and rating schools or districts in a state. Failing schools may face sanctions including takeover or reconstitution. Successful schools may receive recognition or financial rewards. School-based accountability systems most often involve a collection of performance measures ranging from tests to dropout rates to student and/or teacher attendance rates. The quality of a state's school-based accountability system rests largely on the precision, reliability, validity and ultimately the comparability of performance indicators. Further, the effectiveness of the accountability system (in terms of student outcomes) rests on the strength of that system as measured by Carnoy and Loeb. The Kansas Quality Performance Accreditation Act falls well short in nearly every way possible.

Usefulness of Current QPA and Kansas Assessment Data for School-based Accountability

First, the precision,[49] reliability,[50] validity[51] and comparability[52] of data as presently used in QPA are grossly inadequate for accountability purposes. A broad conceptual problem with QPA is that school and district officials have relatively wide latitude regarding the goals they set, the data they present and the way in which they present that data toward achieving "accreditation." The broad requirements for evaluating "continuous improvement" are defined as follows:

> **91-31-16 (I)** Continuous improvement means advancement utilizing data from three or more aligned measurements of performance in targeted areas of student performance when compared to results of previous years. These measurements of performance shall include the Kansas assessments and two or more locally determined measurements of performance.

Regardless of the potential usefulness of individual performance measures, the ability of local schools and districts to pick and choose their measures significantly compromises QPAs legitimacy as an accountability tool. Quite simply, we can't know whose doing well, and who's doing poorly, unless all schools and all districts report the same data, in the same way.

Further, even if the broad framework were "tightened" by requiring comparable reporting, available performance measures, including those required for QPA (state

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[48] Melissa Roderick, Brian Jacob and Anthony Bryk (2003) The Impact of High-Stakes Testing in Chicago on Student Achievement in Promotional Gate Grades. Educational Evaluation and Policy Analysis 24 (2) 333-358

[49] Failure to include precise measures of individual student gains from year to year

[50] Inability to reliably track individual students by their scores, over time, and generate reliable measures of school effects

[51] Inability to effectively isolate school effects, due to failure to measure individual student gains and/or control for other environmental factors

[52] Failure to require that the same data be reported, in the same way, toward a standard set of goals/objectives.

assessments) are minimally if at all useful for evaluating "school performance." Hanushek and Raymond (2002) provide the framework in Table 26 to describe the different approaches used by states for evaluating schools and districts.[53]

Status Only: Status models involve measuring student's average test scores, or percentages of student passing a specific benchmark at a given grade level in a given year. Hanushek and Raymond note the following regarding the "status model:"

> "The "status model" simply takes the average performance of students taking the test in a school as a measure of the outcomes in each school. (While more important later, we do not distinguish at this point between systems built on calculating grade averages as opposed to school averages). The first point from this is obvious: If the main purpose of the accountability system is assessing the performance of the *school,* average test score does it very imperfectly. The average achievement will incorporate all of the current and historical inputs to achievement including not only schools but family background and random errors included in *other*. With the status model, it is not possible to factor out year-to-year changes in student body composition, or grade-to-grade changes in instructional design or teacher quality. Thus, the simple average score indicates the level of student performance but cannot pinpoint the source of that performance. That these imperfect scores figure into the determination of sanctions and rewards just adds to the problem." (p. 5)

Status Change: In a status change model, one might, for example compare the average performance (or percent passing a specific benchmark) of students in a specific grade in a school, to students in that same grade, the next year. Regarding status change approaches, Hanushek and Raymond note:

> "The error in measuring change in school performance goes directly back to the underlying determinants of achievement. The status gain model necessarily compares two different groups of students, only some of whom are common across years. Thus, the status gain has two primary components – the object of interest which is the difference in school quality (.*school*) across the two years and the difference between the two groups of students in family background and other nonschool factors (.*other*). Importantly for some considerations, other differences incorporate any idiosyncratic measurement errors affecting achievement (.measurement *error), and this may have elevated importance*. Just like the status model that relies on the level of average achievement, the status gain model completely entangles school performance with student background differences and measurement errors. The best interpretation

[53] Eric Hanushek and Margaret Raymond (2002) Lessons About the Design of State Accountability Systems. Prepared for "Taking Account of Accountability: Assessing Policy and Politics" Harvard University, June 9 – 11, 2002.

would be that, if variations in quality improvements across schools are large relative to differences in the other factors, changes in grade or school performance would dominate the changes. But, there is little existing evidence that would support that interpretation.

It might be tempting to argue that local schools in stable communities have similar family inputs and thus *.other* will be small. But the U.S. population moves a surprisingly large amount. Only 55 percent of students live in the same house for three years in a row, and this falls to half for disadvantaged students.[4] Moreover, residential mobility is often related to significant changes in family circumstances such as divorce or job loss and change. In growing states the mobility rates increase noticeably from these national averages. The average annual student mobility across schools in Texas, for example, exceeds 20 percent.

The implications of mobility for the accountability approaches are clear. As mobility increases, differences in the backgrounds, preparation, and abilities of the two groups of students over time will influence difference in aggregate performance in the status gain model. Now not only current differences in nonschool factors enter but historical differences also do – and mobility implies that two adjacent cohorts will also diverge in terms of the past schools they attended." (pp. 7-8)

Grade Level Change: Hanushck and Raymond describe grade level change models as an extension of status change models, but focusing specifically on changes in performance of cohorts over time, at specific grade levels, rather than aggregating data to school averages (e.g. rather than combining 3rd grade status change and 6th grade status change measures to evaluate a K-6 school). Regarding these methods, they note:

> "Nonetheless, these grade approaches still suffer from difficulties in separating *school* and *other* factors." (p. 9)

Cohort Gain: Cohort gain analysis involves comparing the average performance of a cohort of students at one point in time, with the average performance of that same cohort at a later point in time. For example, comparing the average scores of 3rd grade students in year 1 with the average scores of 7th grade students in year 5. Regarding this method, Hanushck and Raymond note:

> "Consider, for example, comparing the scores of third graders in 2001 with those of fourth graders in 2002. With a stable student body (i.e., with no in or out migration for the school), the historical school and nonschool factors would cancel out (because they influence a cohort's performance both in grade 3 and grade 4). The cohort gain score would then reflect what the school contributed to learning in grade 4 plus any differences in idiosyncratic test factors or measurement errors across the two grades. The influence of family differences on current achievement

growth rates would also remain, so that if, for example, disadvantaged students would be expected to have lower rates of improvement in performance than more advantaged, such differences would remain confounded with school factors. The family background and ability factors that affect the cohort gain calculations are, however, ones that affect the rate of growth of learning, not the level. Thus, they would be expected to be relatively small. As a result, the cohort model would generally yield a closer measure of *school* inputs than the status model.

The main concern is how the calculations handle mobility. To the extent that the calculations simply follow the current students in each grade in each year, in and out migration yield the same type of problems discussed previously – the comparisons do not eliminate the differences in nonschool factors across groups.

A number of options for adjusting cohort gains can provide information that is closer to the true impact of schools. One modification simply excludes students entering during the school year from the average achievement calculations. This modification has three advantages for measuring school quality – students who move typically have less learning gain in the year of the move because of the disruption5; they have received less than a full dose of the teaching in their current school but part of the teaching in their prior school; and one element of potentially large change in nonschool factors is eliminated. With this modification, the cohort model still compares different groups of students (because those exiting the school between third and fourth grade testing are still included in the earlier achievement calculations but not the second). Moreover, because mobility is correlated with family backgrounds, the achievement measures are likely to be biased by any differences in student mobility rates across schools. The error would nonetheless be expected to be less than in the no adjustment comparisons." (pp. 9-10)

Individual Gain: [54] Individual gain scores are based on measuring the changes in individual student's scores from one point in time to the next. They can be used for measuring school or district performance by first calculating individual student's gains, then aggregating the gain scores for individual students to the school level. Regarding individual gain scores, Hanushek and Raymond note:

"If we follow individual students across grades, any historical influences of families and nonschool factors wash out, and the average of individual gains across grades would more closely reflect school quality for the given grade. Nonetheless, it would still incorporate any current influences of

[54] William Sanders and Sandra Horn (1998) Research Findings from the Tennessee Value-Added Assessment Stystem (TVAAS) Database: Implications for Educational Evaluation Research. *Journal of Personnel Evaluation in Education* 12 (3) 247-256. S. Paul Wright, Sandra P. Horn and William L. Sanders (1997) Teacher and Classroom Context Effects on Student Achievement: Implications for Teacher Evaluation. Journal of Personnel Evaluation in Education 11 57-67. R. Darrel Bock, Richard Wolfe, Thomas H. Fisher (1996) A Review and Analysis of the Tennessee Value Added Assessment System. Final Report. Prepared for the Office of the Comptroller. State of Tennessee.

family and ability on the growth in achievement and any measurement errors in the separate grade tests." (pp. 10-11)

Table 26
Hanushek and Raymond's Framework for Classifying Student Performance Assessment in the Context of State Accountability Systems

Cross-Sectional Approaches				***Student Change***	
School Status Model (or Status Change)		**Grade Level Change**		**Cohort Gain**	**Individual Gain Score**
Arkansas	New Hampshire	Alaska	Louisiana	New Mexico	Tennessee
Alabama	New York	Colorado	Oklahoma	North Carolina	Massachusetts
California	Ohio	Delaware	Rhode Island		
Connecticut	Oregon	Florida	Vermont		
Georgia	South Carolina	Kentucky	Wisconsin		
Mississippi	Texas				
Maryland	Virginia				
Michigan	West Virginia				
Nevada					

In Table 26, Hanushek and Raymond note the prevalence of cross-sectional approaches, but throughout the article raise concerns about both the (a) precision and accuracy of these approaches for evaluating schools and (b) unintended incentives that may emerge from cross sectional performance measurement:

> "The chief information conveyed by these data is the prevalence of using cross-sectional score information. This choice generally precludes sorting out the various components of achievement. Moreover, as we discuss below, this choice tends to increase the incentives for states to manipulate the testing and to attempt to change scores by means other than improving school quality. Specifically, the accounting systems that track student achievement over time improve the incentives for schools, because the results do a better job of explaining the real state of schools without confounding influences mixed in." (p. 18)

Where does Kansas fit into both Carnoy and Loeb's framework and Hanushek and Raymond's framework?

Summarizing what we know from Carnoy and Loeb and Hanushek and Raymond:

1. Stronger accountability is positively associated with student outcomes. In particular, states with only a report card system, no incentives or sanctions or high stakes testing tend to have smaller NAEP gains over time.[55]

[55] Note that both Carnoy and Loeb and Hanushek and Raymond exclude Kansas from their analyses, due primarily to lacking sufficient NAEP data to evaluate student value added. That is, when attempting to adhere to appropriate standards for empirical research, neither team of researchers believed that it was appropriate to use Kansas NAEP data to evaluate student achievement gains. See Carnoy and Loeb, endnote 11, p. 323.

2. Student level value added analysis is the best way to isolate school quality effects on student outcomes and appropriate use of such data can reduce adverse, unintended consequences. Cross-sectional approaches are most problematic, both in the technical sense of the ability of these approaches to precisely and accurately measure school quality and in terms of the adverse incentives that may emerge.

Where does QPA, and the Kansas state assessment system fit into this picture?

- Carnoy and Loeb rate Kansas as a "1" for "weak" accountability, noting that Kansas uses a report card type system with no incentives and weak sanctions.(p. 324)
- QPA is a status and/or status change measurement system that does not even require that all schools use the same status measures, or calculate status or status change in the same way.
    - Status change measures are significantly problematic in Kansas districts for the very reasons Hanushck and Raymond describe. Using recently provided Kansas state assessment data that included students' names, I compared the 1997 7th grade cohort taking the reading test with the 2001 11th grade cohort taking the reading test for USD 101 (selected because it was first on the list). In 1997, 97 7th graders took the reading test and in 2001, 102 11th graders took the test. However, this change was not a simple addition of 5 test-takers. Rather, only 75 children appeared in both the 1997 7th grade test and 2001 11th grade test. That is, there was only about 75% overlap from one test administration to the next, with the "same" cohort.
- The present assessment system is designed such that individual student level value added cannot feasibly be analyzed and compared statewide.

Under the current accountability system, the legislature's duty to the child cannot be measured from either an input based or outcome based perspective. Assume that the duty is input based, and that each child should be able to attend a "quality" (suitable) school, and that the accountability system is supposed to provide insurance to that effect. The type of measurement presently used – status or status change – is a poor, if not useless way to evaluate school quality. Alternatively, assume that the legislature's duty is outcome based, and that the legislature's duty is that each child should be able to achieve certain outcomes by participating in public schooling in Kansas. Under the present measurement system, there is no way to measure/track the progress of any individual child over time.

In the next few subsections, I further address how or whether Kansas assessment data have any influence on accreditation. All Kansas schools are accredited, despite wide variations in outcomes. In addition, I raise questions of what is really being measured in such classifications as "standards of excellence." **The bottom line is that the present accountability system in Kansas, the Quality Performance Accreditation Act,**

represents the second worst case scenario (second only to no accountability at all) under either Hanushek and Raymond's framework or Carnoy and Loeb's index.

C. Do Kansas Assessment Data Influence School Accreditation?

A basic premise of QPA is that until a school is deemed "excellent," by virtue of meeting the standards of excellence (to be discussed in greater detail at a later point), that school should file a plan to show how it is improving, and will continue to improve toward achieving *standards of excellence*. **All Kansas schools are accredited.** As such, we must assume that all Kansas schools, thus districts[56] are either performing at "exceptional" levels and/or showing continuous improvement over time, with hope of achieving those levels within a reasonable time frame. If QPA is a legitimate system of accountability, then QPA must insure that all Kansas children have access to "quality" schools.

In this section, I take a brief look at low performing school districts from 1996 to 1999 on high school reading and math assessments. I choose high school assessments because they represent the final testing point in each district, or time by which students should be ready to enter higher education or be productive contributors in the labor market. An important question is whether or not QPA provides any stimulus (stick or carrot) for schools or districts to improve, especially for those schools or districts that are performing consistently poorly. An even more basic question is whether QPA actually identifies schools or districts as performing poorly, both in terms of average performance level, and in terms of QPA's broad conception of "continuous improvement." That is, if QPA is intended to meet a duty that each child should be able to attend quality school, then QPA must be useful for identifying schools or districts that fail to meet quality standards.

I begin by identifying districts that were in the bottom decile of performance on high school reading and math assessments, in terms of percentages of students passing, from 1996 to 1999. First, I work with the broad assumption that "passing" the state assessment is perceived as important, or that the state assessments are meaningful to the state board of education and legislature, and that the "passing" cut-off indicates some measure of "minimum quality."[57] Table 27 identifies those districts that were in the bottom decile of districts, by percent passing high school reading and high school math assessments from 1996 through 1999. In reading, 3 districts were in the bottom decile all four years, USD 500, USD 404 and USD 202. In math, 2 districts were in the bottom decile all four years, USD 500 and USD 202. All high schools in USD 500 and USD 202

[56] If schools within a district are all doing well, then the district, as an aggregate of its schools must be doing well. However, if a district is doing well in the aggregate, it does not necessarily mean that all schools in that district are doing well.

[57] While QPA measures performance at the school level, I choose to aggregate to the district level because the district is the organizational level that receives and is ultimately responsible for allocating state revenues toward achieving specific student outcomes. As such, the link between the state's school finance policy and student outcomes can only be made at the district level. Districts might choose to pour resources into a specific school, and/or organize students by certain interests or abilities in specific schools leading to some schools in some districts performing exceptionally well and others quite poorly. In the end, what is relevant to the discussion at hand is how well a district does for all of its students, given its available resources. As such, one might argue that if SDF is to allocate funds to the district level, QPA should evaluate performance at the district level (though with student level value added data).

are accredited, suggesting that the state board of education believes that these schools provide either "excellent" education to their children or that these schools are showing "continuous improvement" toward that goal.

Table 27
Districts in Bottom Decile of Performance, by Percent Passing Standard

Reading				Math			
1996	1997	1998	1999	1996	1997	1998	1999
104	**202**	102	**202**	200	**202**	102	**202**
202	209	**202**	203	**202**	203	**202**	205
204	215	209	209	205	205	209	209
205	247	238	213	210	209	216	210
215	249	246	214	215	246	221	216
216	283	247	215	216	247	246	252
285	286	256	222	245	253	247	275
301	304	301	249	246	256	250	278
310	307	324	268	250	261	270	279
314	323	334	270	275	283	285	285
324	346	335	278	283	286	286	334
347	348	344	334	300	307	300	358
353	351	348	335	310	349	335	366
354	362	353	338	338	351	348	381
356	387	362	340	342	358	351	393
367	393	373	386	353	367	353	398
387	397	375	395	367	417	360	413
398	**404**	396	398	390	436	371	428
402	413	397	**404**	402	445	389	436
404	*430*	**404**	413	409	454	395	447
409	431	409	419	461	457	409	457
420	457	*430*	*430*	462	475	415	458
438	459	435	447	470	477	445	470
455	470	454	455	486	486	446	494
461	486	459	461	493	493	454	499
468	493	480	470	499	499	462	**500**
486	499	492	480	**500**	**500**	470	505
487	**500**	493	486	508		493	507
492	505	**500**	**500**			**500**	
493		503	508				
500							
508							
509							

Source File: Tests9599.xls

The persistent failures of students in USD 500 (Kansas City) and USD 202 (Turner – Kansas City) in both math and reading at the high school level, raises the question of whether QPA does anything to guarantee children attending those districts the opportunity to receive a suitable education. One might attempt to explain QPA's failure to identify these districts overall as substandard by arguing that these districts, while performing poorly, are showing "continuous improvement."

Table 28 and Table 29 show the yearly percentages of high school students passing reading and math tests at the high school level for these perpetually underperforming districts. Neither table shows a pattern of continuous improvement in percent passing, for either test, for any of the failing districts. If anything, percentages passing are stable or declining.

Table 28
Percent Passing High School Math

	USD 202 – Turner	USD 500 – Kansas City
1995	34.84	29.98
1996	33.14	31.43
1997	35.10	33.10
1998	32.18	30.38
1999	32.29	30.91

Source File: Tests9599.xls

Table 29
Percent Passing High School Reading

	USD 202 – Turner	USD 404 – Riverton	USD 500 – Kansas City
1996	57.40	55.08	54.31
1997	54.71	58.01	53.64
1998	53.57	58.58	52.81
1999	54.61	57.91	53.36

Source File: Tests9599.xls

Table 30 displays the achievement gap for Kansas City students, relative to the rest of the state, for elementary, middle and high school math and reading assessments. The Gaps presented in the table were estimated via regression analysis, controlling for student's race, income status and language proficiency status. Children with disabilities were excluded. That is, the gaps represent the average difference in test scores of Kansas City students, compared with students of the same race, free or reduced lunch status, or language proficiency status. The dependent variable was the z-score of each child's test score, or the number of standard deviations above or below the statewide mean, for non-disabled students. Table 30 indicates that Kansas City children in elementary grades were nearly ½ a standard deviation below their peers in 1997 and 2001. At the middle school level, they were less than ½ a standard deviation below their peers in 1997, but over ½ a standard deviation below their peers by 2001. This would hardly appear to be a pattern of "continuous improvement." Further the GAP seems relatively large, given that controls were included to compare students of similar poverty level, race and language proficiency. In general, the reading gaps are smaller.

Where gaps are decreasing steadily one might extrapolate the point at which the gap would be reduced to "0" if the same rate of improvement were to continue. Of course, it is unlikely that a straight-line of convergence toward the mean would be achieved. One could, for example, calculate a *Gap Reduction Rate* as the slope of the convergence, and use that rate as an index of "continuous improvement." It is important to be able to measure how long it would take a district to become average at its present *Gap Reduction Rate,* because it is important to know just how many students, or generations of students will be left behind as we wait for the district to become average.

For high school reading, the only *cross-sectional* pattern showing a steady reduction, the *Gap Reduction Rate* is -.02 standard deviations per year. At that rate of "continuous improvement" Kansas City high school reading performance would be "average" by 2011. This assumes that steady, linear progress can be made in reducing the gap. With 1,100 to 1,400 non-special education children per year passing through this testing benchmark (high school reading/math), waiting until 2011 for Kansas City high schools to be "average," means leaving behind 11,000 to 14,000 children. QPA, by retaining accreditation for Kansas City high schools as it has historically, will have done nothing to insure that these 11,000 to 14,000 children have access to quality schools (between 2001 and 2011).

Table 30
Estimates of the GAP (standard deviations below rest of state) for Kansas City Students, controlling for race, low income status and language proficiency status (excluding students with disabilities)

		1997 KCK Gap (Coefficient)	Sig.	1999 KCK Gap (Coefficient)	Sig.	2001 KCK Gap (Coefficient)	Sig.
Math	Elementary	-.48	*	-.44	*	-.49	*
	Middle	-.30	*	-.50	*	-.55	*
	Secondary	-.33	*	-.18	*	-.31	*
Reading	Elementary	-.35	*	-.46	*	-.27	*
	Middle	-.18	*	-.22	*	-.10	*
	Secondary	-.27	*	-.22	*	-.19	*

*p<.001
Source File: Individual student assessment files for each test administration

Table 31 shows the gaps for Turner school district. Gaps in Secondary math performance for Turner are strikingly large, and like those in Kansas City, not displaying "continuous improvement" by any reasonable measure. Reading performance in Turner tends to be more erratic, but generally improved by 2001 at the middle and secondary levels. Again, however, Turner has a ways to go before being even "average," no less "excellent."

Table 31
Estimates of the GAP (standard deviations below rest of state) for Turner Students, controlling for race, low income status and language proficiency status (excluding students with disabilities)

		1997 Turner Gap (Coefficient)	Sig.	1999 Turner Gap (Coefficient)	Sig.	2001 Turner Gap (Coefficient)	Sig.
Math	Elementary	-.35	*	-.12		-.23	*
	Middle	-.40	*	-.23	*	-.80	*
	Secondary	-.51	*	-.59	*	-.52	*
Reading	Elementary	-.39	*	-.17		-.33	*
	Middle	-.47	*	-.56	*	-.19	*
	Secondary	-.47	*	-.53	*	-.16	*

*p<.001
Source File: Individual student assessment files for each test administration

D. What do the "Standards of Excellence" Really Measure?

One element of Kansas' school-based evaluation system is the system of identifying schools as meeting the "standards of excellence." When a school meets the standards of excellence, that school no longer must file school improvement plans. (QPA Manual p. 11)

> **Summary of Regulation:** This regulation requires each school to prepare a written plan describing the school's goals and strategies for improving student learning. It also requires schools to target student improvement within three areas (reading, mathematics, science, social studies, and writing) until the school has achieved the building Standards of Excellence for those academic areas. Two of the three areas targeted must be mathematics and reading until the Standards of Excellence are achieved for those respective subject areas. *(Authorized by and implementing Article 6, Section 2(a) of the Kansas Constitution; effective Dec. 27, 1996; amended Aug. 27, 1999.)*

Schools meet the standards of excellence primarily by having their students perform well, on average, on specific content areas of the state assessments. Appendix B lists schools meeting the standards of excellence in school year 2001- 2002.

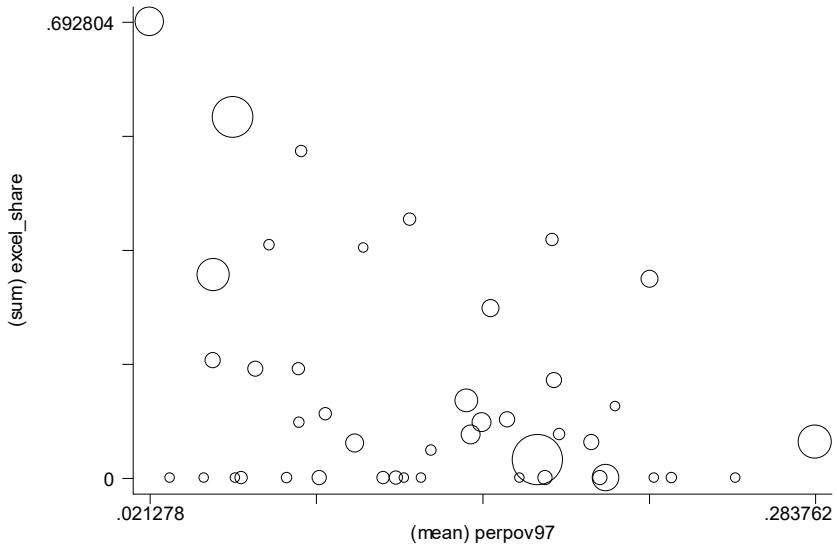
Under Hanushek and Raymond's framework, standards of excellence are measured in "status" terms, or cross-sectionally, raising significant questions as to what is actually being measured by the standards of excellence. Let's assume, however, that the state board of education, in adopting these standards of excellence, believes that they somehow represent school quality. Working with that assumption first, this section raises the question of whether the opportunity to attend "quality schools" (or districts) is equitably distributed to students across Kansas.

For this analysis, I create a district level opportunity measure based on schools identified as achieving standards of excellence in 2002. The opportunity measure is the

"percent of children in each district that attend a school that meets a standard of excellence." For example, a district might have one elementary, one middle and one high school, each serving 200 pupils. The elementary school in that district might meet a standard of excellence, while the other two schools may not. As such, 1/3 of children in the district have the opportunity to attend an "excellent" school. I restrict this analysis to the state's larger districts (>1,725 pupils) in order to include mainly districts with more than one building and also to include districts with sufficient test taking sample size for the standard of excellence to be more stable.

Figure 18 shows that among Kansas larger districts, the percent of children who have the opportunity to attend a school that meets the standards of excellence is systematically higher in schools with fewer children in poverty. That is, assuming that the "standard of excellence" is a reasonable indicator of school quality, the opportunity to attend a quality school is highly related to poverty. In fact, poverty share alone explains 33% of the variance in percent attending "excellent" schools.

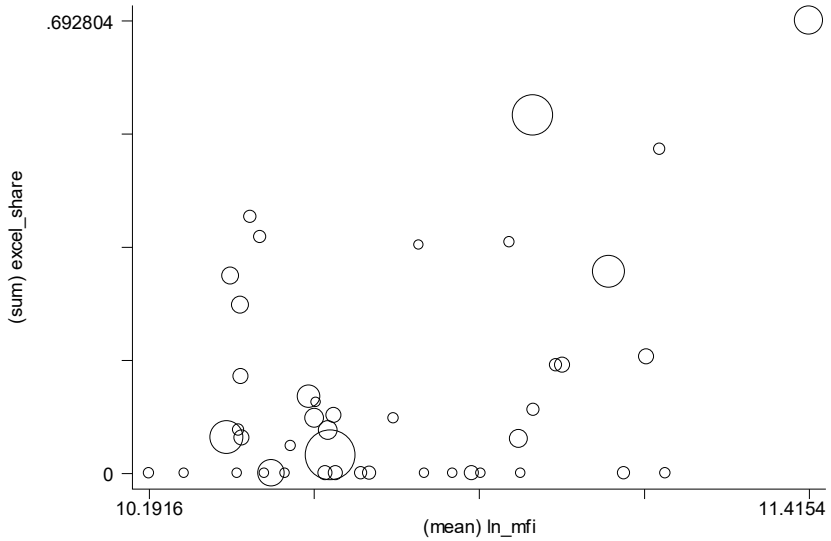
Figure 18
Percent attending "excellent" schools (vertical) and percent in poverty



Slope = -1.74 (p<.001)
R^2 = .33

Figure 19 displays a similarly strong relationship between the natural log of median family income and the percent of children attending "excellent schools." In this case, natural log of median family income explains nearly 40% of the variance in percent attending excellent schools. That is, children in higher income districts are much more likely to attend an "excellent school."

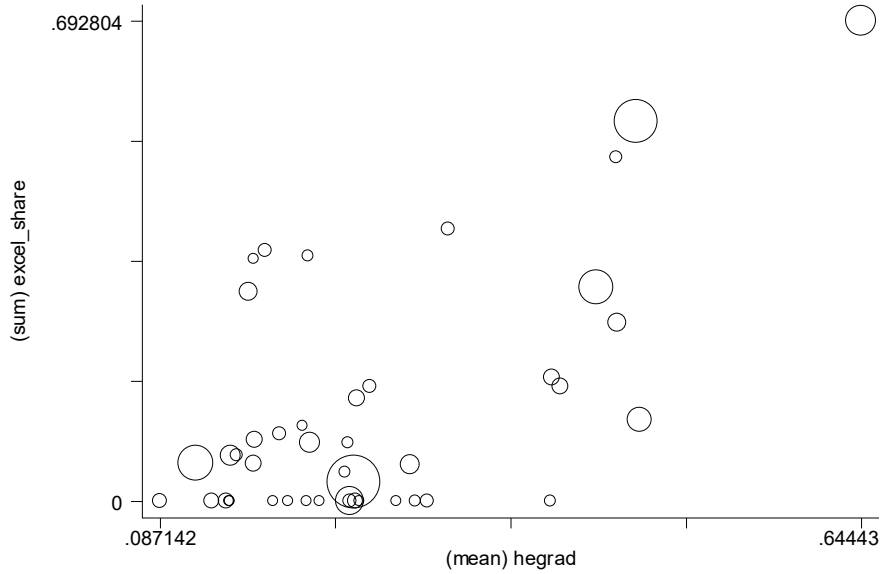
Figure 19
Percent attending “excellent” schools (vertical) and median family income



Slope = .45 (p<.001)
R^2 = .38

Figure 20 shows that children in districts where a higher percent of the adult population has a bachelors degree or higher, are much more likely to attend “excellent schools**.” In this case, the independent variable, “percent bachelors degree or higher” explains nearly 60% of the variation in opportunity.**

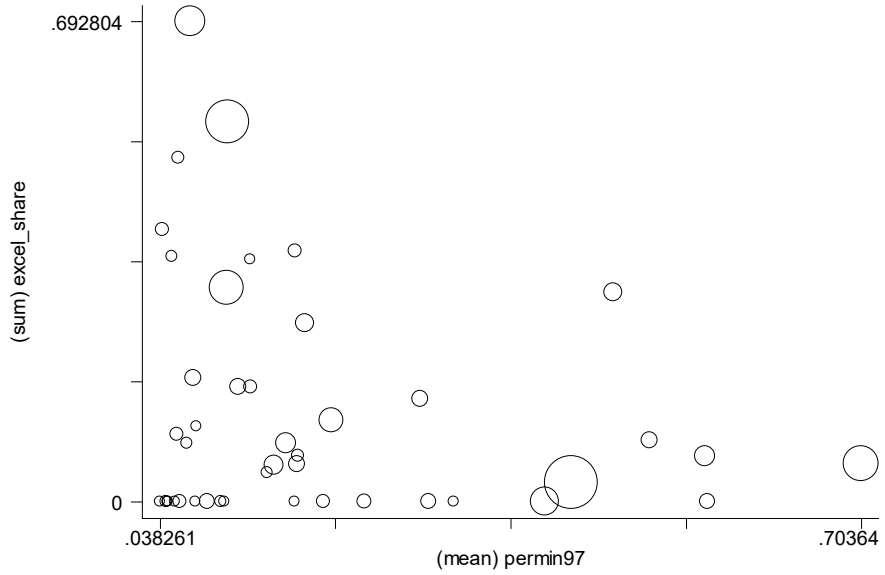
Figure 20
Percent attending “excellent” schools (vertical) and percent of adults with a bachelors degree or higher



Slope = 1.16 (p<.001)
R^2 = .58

Finally, Figure 21 displays the relationship between district percent minority and the likelihood that a child attends a school that meets the standards of excellence. **In this case, race alone, not accounting for income or education level, explains 20% of the variance in shares of children attending excellent schools. Districts with more minority students have fewer children in "excellent schools."**

Figure 21
Percent attending "excellent" schools (vertical) and percent minority



Slope = -.49 (p<.001)
R^2 = .19

Indeed there are two perspectives that can be painted with these findings. First, as I have framed it thus far, we can accept that the "Standards of Excellence" under QPA are meaningful measures of school quality. If this is the case, then quality schools are strongly, disparately available to Kansas children by race, income and parent education level. The legislature and board of education are not only failing to insure that all children can attend quality schools, but they are disproportionately failing to insure quality schooling for lower income children from less education households, and minority children. Further, if convergence toward standards of excellence is to be the primary measure of "continuous improvement," then continuous improvement is most easily achieved if a district can become richer, whiter and more educated.

The alternative perspective is that the "standards of excellence" themselves have little or nothing to do with school quality. Rather, the standards of excellence simply measure differences in socio-economic conditions. In this case, the standards of excellence and all related indicators of schooling quality in QPA are relatively meaningless with respect to their intended purpose, and certainly not useful for evaluating whether or not children are being provided suitable quality and equitably distributed opportunities.

Quality Performance Accreditation, and the Kansas State Assessment system, as they are presently designed and used for evaluating school quality

provide little or no insurance that Kansas school children will have comparable access to quality schools. As a result, accreditation standards in QPA provide no reasonable framework for evaluating the relative suitability of funding. That is, it would be absurd to suggest that present funding levels are suitable simply on the basis that all Kansas schools are accredited.

VI. SCHOOL FINANCE, TEACHER QUALITY & THE DISTRIBUTION OF KANSAS TEACHERS

A. Importance of Teacher Quality

In recent years, the debate on schooling quality and how to strengthen the connection between schooling resources and student outcomes has shifted from emphasizing the importance of teacher quantity (e.g. class size reduction) to emphasizing the importance of teacher quality. In the 1990s, the Tennessee STARS studies and other class size reduction (CSR) research led policymakers to believe that large scale class size reduction would be a panacea for improving the education of low income children. Indeed, there was, and still remains significant evidence of the positive effects of class size reduction on student performance. However, the emphasis on class size reduction, and subsequent large scale efforts to reduce class size in states like California revealed other important issues.

In particular, researchers began to see that large scale class size reduction had unintended teacher labor market and related equity consequences. To summarize, as California school districts began to reduce class sizes, the pool of "qualified teachers" fell short (relative to the increase in demand). A significant equity consequence was that more highly qualified teachers were drawn to wealthier, more desirable school districts that had openings as a result of class size reduction. Districts serving lower income children, on the other hand, were drained of qualified staff. The result was that lower income children were attending smaller classes, but with less qualified teachers.

A fair amount of research on teacher quality precedes the recent obsession with class size reduction, yet interest in teacher quality research appears to be at a peak in the wake of equity concerns resulting from large scale class size reduction, and general context of tightened teacher labor markets of the late 1990s. There is seemingly little debate regarding the importance of "quality teachers," and potential effects of quality teachers on student outcomes. In a review of literature for a study on the distribution of teaching quality (to be discussed later) in New York State, Hamilton Lankford, Susanna Loeb and Jim Wyckoff note the following:

> "Rivkin, Hanushek and Kain (2000) attribute at least seven percent of the total variance in test-score gains to differences in teachers and they argue that this is a lower bound. Sanders and Rivers (1996) find that the difference between attending classes taught by high-quality teachers (highest quartile grouping) and attending classes taught by low-quality teachers (lowest quartile grouping) is huge, approximately 50 percentile points in the distribution of student achievement. They also find residual effects of teachers in later years. That is, having a high quality teacher in grade three increases learning not only in grade three but also in grades four and five." (p. 56).[58]

[58] Quoted from: Hamilton Lankford, Susanna Loeb and James Wyckoff (2002) Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis. Educational Evaluation and Policy Analysis 24 (1) 37-62.

C. Indicators of Teacher Quality: Research on Specific Attributes

While there is little debate over the importance of quality teachers, there is some debate regarding "what makes a quality teacher?" Ideally, as in the work of Sanders and Rivers cited by Hanushek, Rivken and Kain, one would measure directly teacher quality by measuring student outcomes. Student outcome data, however, are not broadly available for specific teachers. Other researchers have focused on identifying background attributes of teachers that are associated with improved student outcomes. In general, these teacher "attribute" based studies identify teachers own "academic skills" as a primary influence on the performance of their students. For example:

- Ferguson and Ladd (1996) find that teachers' performance on standardized tests is associated with student outcomes.
- Hanushek (1992), Ehrenberg and Brewer (1995) and Coleman et al. (1966) find specifically that teachers' performance on tests of verbal ability are associated with student outcomes.[59]
- Ferguson (1991, 1998) and Strauss and Sawyer (1986) find that teachers' own performance on teacher licensure exams is positively associated with student outcomes.[60]
- Ehrenberg and Brewer (1994) find that the selectivity of the undergraduate institution attended by a teacher is associated with student outcomes.[61]

In general, research attempting to relate teachers' certification status with student outcomes has been less decisive,[62] as has research attempting to specifically relate National Board Certification (NBC) with student outcomes.[63]

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[59] Ronald G. Ehrenberg and Dominic J. Brewer (1995) Did Teachers' Verbal Ability and Race Matter in the 1960's? Coleman Revisited. *Economics of Education Review* 14 (1) 1-21.

[60] Ronald Ferguson (1991) Paying for Public Education: New Evidence on How and Why Money Matters. *Harvard Journal on Legislation.* 28 (2) 465-498. Ronald Ferguson (1998) Can Schools Narrow the Black-White Test Score Gap? In Christopher Jencks and Meredith Phillips (eds), *The Black-White Test Score Gap.* Washington, DC: The Brookings Institution. Robert P. Strauss and Elizabeth Sawyer (1986) Some New Evidence on Teacher and Student Competencies. *Economics of Education Review* 5 (1) 41-48.

[61] Ronald G. Ehrenberg and Dominic J. Brewer (1994) Do School and Teacher Characteristics Matter? Evidence from High School and Beyond. *Economics of Education Review* 13 (1) 1-17.

[62] Dan Goldhaber and Dominic Brewer (2000) Does Teacher Certification Matter? High School Teacher Certification Status and Student Achievement. Educational Evaluation and Policy Analysis 22 (2) 129-146. See Linda Darling-Hammond, Barnett Berry and Amy Thoreson (2001) Does Teacher Certification Matter? Evaluating the Evidence. Educational Evaluation and Policy Analysis 23 (1) 57-78. Dan Goldhaber and Dominic Brewer (2001) Evaluating the Evidence on Teacher Certification: A Rejoinder. Educational Evaluation and Policy Analysis 23 (1) 79 – 86. Laczko-Kerr, I., & Berliner, D.C.. (2002, September 6). The effectiveness of "Teach for America" and other under-certified teachers on student academic achievement: A case of harmful public policy," *Education Policy Analysis Archives*, *10*(37). Retrieved [date] from http://epaa.asu.edu/epaa/v10n37/.

[63] J.E. Stone. The Value-Added Achievement Gains of NBPTS-Certified Teachers in Tennessee: A Brief Report. http://www.education-consumers.com/briefs/stoneNBPTS.shtmZehr, Mary Ann (2002 – October 2) ECS Review Discounts Study Critical of Teaching Board. Education Week. See also Synthesis of Reviews of "The Value-Added Achievement Gains of NBPTS-Certified Teachers in Tennessee: A Brief Report" http://www.ecs.org/ecsmain.asp?page=/html/special/nbpts/letter.htm

D. Salaries and Teacher Quality

In general, empirical research in economics supports the contention that higher salaries influence the quality of teaching. For example:

1. Murnane and Olson (1989) find that salaries affect the decision to enter teaching and the duration of the teaching career.[64]
2. Figlio (1997, 2002) and Ferguson (1991) find that higher salaries are associated with better qualified teachers[65]
3. Loeb and Page (1998, 2000) find that raising teacher wages by ten percent reduces high school dropout rates by between three and six percent and increases college enrollment rates by two percent.[66]

That said, the salary/quality connection in public education teaching is somewhat different from typical assumptions of salary/quality relationships. The differences occur mainly because teacher salaries tend to vary primarily as a function of years of service and level of education, regardless of whether those factors are legitimately associated with teaching quality. Further, salary levels are determined within a public budgeting process which typically involves collective bargaining. One result is that numerous other factors related to working conditions and/or living conditions may exert strong influences on the career choices of teachers. This is not to suggest, however, that salaries cannot make a difference, especially when it comes to distributing, or redistributing teachers among school districts.

E. Mobility, Distribution and Equity Concerns

A significant body of recent research addresses the questions of how teachers are distributed across districts and the extent to which teacher salaries or other "controllable" factors, along with various uncontrollable factors influence teacher mobility and the eventual distribution of "quality teachers." Lankford, Loeb and Wyckoff find that teachers with stronger qualifications have significantly more opportunity for mobility:

> "New York State teachers who began their careers in 1993 and transfer to a different district or quit teaching have stronger qualifications than those who remain in the same district. Teachers transferring to a different district are half as likely to have failed either the NTE General Knowledge or NYSTCE Liberal Arts

[64] Richard J. Murnane and Randall Olsen (1989) The effects of salaries and opportunity costs on length of state in teaching. Evidence from Michigan. *Review of Economics and Statistics* 71 (2) 347-352

[65] David N. Figlio (1997) Teacher Salaries and Teacher Quality. *Economics Letters* 55 267-271. David N. Figlio (2002) Can Public Schools Buy Better-Qualified Teachers?" *Industrial and Labor Relations Review* 55, 686-699. Ronald Ferguson (1991) Paying for Public Education: New Evidence on How and Why Money Matters. *Harvard Journal on Legislation.* 28 (2) 465-498.

[66] Susanna Loeb and Marianne Page (2000) Examining the link between teacher wages and student outcomes: the importance of alternative labor market opportunities and non-pecuniary variation. *Review of Economics and Statistics* 82, 393-408. Susanna Loeb and Marianne Page (19980 Examining the link between wages and quality in the teacher workforce. Department of Economics, University of California, Davis.

> and Science certification exam. They are 35% more likely to have received their BA from a highly or most competitive college and they are about half as likely to have received their BA from the least competitive colleges." (p. 50)

Further, they find that more highly qualified teachers that move on to teaching jobs in other districts, tend to move to districts with both higher salaries and fewer low income and minority students. Assuming these patterns to be persistent, the eventual outcome is that higher quality teachers become concentrated in districts with higher salaries and fewer low income and minority pupils.

Lankford, Loeb and Wyckoff (2002) using data on New York schools, like Hanushek, Kain and Rivken (2001) using data on Texas schools, find student population characteristics to exert relatively strong influence on teacher sorting.[67] Loeb (2000) and Boyd, Loeb, Lankford and Wyckoff (2003), however attribute some of the insensitivity of teacher mobility to wages to the present lack of sufficient compensating differentials needed to recruit highly capable individuals into teaching to begin with, and further, to encourage high quality teachers to take jobs in low performing, "difficult" schools.[68] That is, significant "combat pay" so-to-speak might be required to off-set adverse working conditions. Loeb (2000) concludes that:

> "Targeted salary increases and/or targeted improvements in working conditions are needed to draw high-quality teachers to low-performing schools and to alleviate the inequities we see in the quality of the teacher force across the state (NY) and across the country." (p. 1)

Similarly, Jennifer Imazeki (2001) estimates that reducing attrition in urban and rural districts "to the same levels as in an average district would require wage increases from fifteen to thirty percent."[69]

In summary, teacher labor market research suggests that salaries can be a useful tool for improving equity in the distribution of quality teachers. That is, paying substantially higher salaries in poor urban districts competing for teachers with neighboring wealthy suburban districts may help to balance teaching quality disparities. Further, using fiscal resources to improve working conditions that influence teacher sorting may also help.

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[67] Hamilton Lankford, Susanna Loeb and James Wyckoff (2002) Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis. Educational Evaluation and Policy Analysis 24 (1) 37-62. Eric Hanushek, John Kain, Steven Rivken (2001) Why Public School Lose Teachers. Working Paper 8599. National Bureau of Economic Research.

[68] Susanna Loeb (2000) How Teachers' Choices Affect What a Dollar Can Buy: Wages and Quality in K-12 Schooling. Working Paper. Education Finance Research Consortium. Rockefeller Institution of Public Policy. State University of New York at Albany. Donald Boyd, Susanna Loeb, Hamilton Lankford and James Wyckoff (2003) Analyzing the Determinants of the Matching of Public School Teachers to Jobs: Estimating Compensating Differentials in Imperfect Labor Markets. Working Paper. Education Finance Research Consortium. Rockefeller Institution of Public Policy. State University of New York at Albany.

[69] Jennifer Imazeki (2001) Moving On or Moving Out? Determinants of Job and Career Changes for Teachers. Working Paper, Department of Economics, San Diego State University. P. 30

F. School Finance Policy, Mobility and Equity

If a poor urban district must pay substantially more to recruit and retain a teacher of similar quality to its wealthy suburban neighbors, then that poor urban district should be provided the fiscal capacity to legitimately compete for high quality teachers. Going back to a premise discussed at several earlier points in this report, districts should be provided sufficient "cost adjusted first tier aid" in order to purchase appropriate quantities (given district characteristics and student needs) of teachers of comparable quality. In general, state school finance policies have yet to become highly sensitive to this need, but urban districts in many states do receive substantial (though perhaps not yet substantial enough) support.

There exist some peculiar circumstances under which state school finance policy may actually inhibit poor urban districts from even attempting to compete for teachers of comparable quality. Jennifer Imazeki (2001), for example explores the effects on the Milwaukee area teacher labor market, of policies in Wisconsin that limit revenues that can be raised with local property taxes and limit increases in teacher salaries. Imazeki finds that these policies keep Milwaukee, in particular, from being able to effectively compete for teachers in their labor market, given that Milwaukee would have to pay significant compensating differentials relative to their neighboring suburbs.[70]

G. What do We Know About the Distribution of Teachers by "Quality Attributes" in Kansas?

I begin this section with a discussion of how, conceptually, the teacher quality debate relates to Kansas school finance policy. Next, I present two analyses of overall teacher quality in Kansas relative to other states, and of the distribution of teachers by accepted quality attributes, based my ongoing related research agenda on teacher labor markets, and state education governance and finance.

Kansas School Finance Policy and Teacher Sorting Among Kansas Districts

The situation in Kansas' "metropolitan" areas bears an interesting resemblance to concerns raised by Imazeki regarding Wisconsin school finance policies. As noted previously, in the Kansas City metropolitan area, for example, Blue Valley, a wealthy suburban district receives more weighted aid per pupil in the "cost adjusted first tier" than Kansas City. From teacher labor market perspective, this difference allows Blue Valley to pay a slightly higher wage to recruit teachers to teach predominantly white, upper middle class children, in new facilities. This is obviously quite far from the logic of providing Kansas City with sufficient aid to compete for similar quality teachers, where doing so would require a significantly higher wage in Kansas City. Even more illogical is that the "cost adjustment" advantage provided to Blue Valley (nearly 10% in 2002 – 2003) over Kansas City is primarily a function of new facilities aid, and one might logically assume

[70] Jennifer Imazeki (2001) School Revenue Limits and Teacher Salaries: Evidence from Wisconsin. Working Paper. Department of Economics. San Diego State University.

that new, high quality facilities would enhance a district's ability to recruit high quality teachers (perhaps even lowering the necessary wage for the same quality teacher).

Recall also that local option budget authority is tied to general fund aid allocation. That is, not only is Blue Valley provided more base aid per pupil, but Blue Valley is also allowed to raise more in local option revenues per pupil. As such, even if local taxpayers would permit, Kansas City would be disallowed under current law from ever raising sufficient revenue to pay the necessary compensating differentials to compete for high quality teachers.

In this section, I have used Blue Valley and Kansas City as examples. It is likely that similar circumstances exist throughout the Kansas side of the Kansas City metropolitan area, where neither general fund aid nor local option authority are sensitive to teacher labor market issues, and likely that similar conditions exist in the Wichita and Topeka areas, as well as some larger towns like Garden City, Dodge City, Salina or Junction City, where significant demographic differences exist between city/town districts and their neighbors, and where in general the city/town districts do not enjoy a significant funding advantage.

Teacher Quality and The Distribution of Kansas Teachers

In this section, I draw on a series of related cross state teacher quality studies in which I am presently involved. The goal of this section is simply to indicate the relative position of Kansas, among states, in terms of limited teacher quality indicators and more importantly to raise questions about the within-Kansas distribution of quality teachers. Recall from earlier in this section, that two indicators of teacher quality that have been consistently found to be associated with student outcomes are (a) selectivity of a teacher's undergraduate institution and (b) teachers' performance on standardized assessments, including performance on teacher licensure exams.

Most researchers in economics that have tested the relationship between undergraduate institution selectivity and teacher effectiveness have relied on the Barron's Guide to America's Most Competitive Colleges, albeit imperfect ranking system, which rates undergraduate institutions as follows (a) non-competitive, (b) less competitive, (c) competitive, (d) very competitive, (e) highly competitive and (f) most competitive. Barron's uses a variety of measures, including acceptance rates and SAT/ACT scores in constructing the categories. Again, while imperfect, economics have repeatedly used this classification system, and have consistently the rating of teachers' undergraduate institutions to be associated with student outcomes, most notably among teachers who attended the most highly selective colleges.

Table 32 and Table 33 are drawn from an ongoing teacher labor market study, which uses Restricted Use (Confidential), individually identifiable data on approximately 40,000 public school teachers across the country, from a survey known as the Schools and Staffing Survey of 1999 (SASS '99), produced by the National Center for Education Statistics. The complex, stratified sampling in SASS '99 is state representative including approximately 700 public school teachers across Kansas. Researchers involved in this project added Barron's rankings (from 0 to 5, from less competitive to most competitive), to the approximately 1,500 undergraduate institutions attended by teachers in the SASS '99 dataset.

Table 32 compares the percent of teachers in each state that attended highly or most selective undergraduate schools. Kansas ranks 42nd among states on this measure. Table 32 then, lowers the bar, to compare the percent of teachers in each state that attended very competitive to most competitive undergraduate schools (where the University of Kansas, for example receives a "3" for very competitive). In this case, Kansas moves up to 36th among states. It is important to note, however, that Kansas ranking (or any state's ranking) in Table 32 is primarily a function of the pattern of teacher production among teacher producing institutions in the state. Economic research generally indicates that teachers trained in a state end up teaching in that state. As such, if there are few or no selective undergraduate institutions in a state that prepare teachers, few or no teachers in that state will have attended selective undergraduate institutions.

Table 33 speaks to the more important issue at hand, but requires the information in Table 32 for context. Table 33 presents the average percent poverty of schools in which teachers from less selective colleges/universities (0 – 2) teach and the average percent poverty[71] of schools in which teachers from more selective colleges/universities (3 – 5) teach. Note that according to Table 32, only 14% of Kansas teachers fall into the latter category – attending more selective colleges. That 14% of teachers, according to Table 28, happen to be teaching in schools with 5.6% fewer children in poverty than the other 86% of Kansas teachers and in districts with nearly 2% fewer children in poverty. To put these "poverty gaps" into perspective, Kansas ranked 38th among states in school level poverty gap and 36th in district level poverty gap (Hawaii and District of Columbia excluded). **The implications of Table 32 and Table 33 taken together is that Kansas faces both a significant quality supply problem, and a significant quality distribution problem, when it comes to this one relatively well-accepted indicator.[72]**

Table 34 raises further questions about the potential influence of the present school finance policy on the distribution of teachers among Kansas larger districts. Recall that a central concern raised repeatedly in this report is that SDF fails to sufficiently differentiate resources to larger school districts on the basis of poverty or other student needs (favoring district needs like "new facilities" over student needs). Table 34 summarizes the current expenditures per pupil of Kansas school districts employing teachers from more and from less selective undergraduate institutions. In Kansas, teachers who attended more selective undergraduate institutions teach in districts that, on average, spent 4% more per pupil than districts in which teachers from less selective undergraduate institutions taught. On this GAP measure, like the school level poverty gap, Kansas ranked 38th among states.

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[71] Based on variable S0287 identifying the number approved for free or reduced price lunch.

[72] Questions of the overall supply quality in Kansas might be partially mitigated by "higher than expected" quality candidates who desire to teach, attending "less selective" undergraduate institutions, because more selective ones are simply not available in Kansas, especially for teacher preparation. Additional studies were undertaken using NCES data (Baccalaureate and Beyond 1997) on undergraduates across the country, including their SAT/ACT scores. The intent was to determine whether, for example, Kansas teachers attending "very competitive" institutions like the University of Kansas or Competitive institutions like Kansas State University, had received SAT/ACT that would have allowed them to go to more selective/competitive institutions if available. Sadly, Baccalaureate and Beyond 1997 lacked a sufficient sample of undergraduate teacher education students across undergraduate teacher preparation programs in Kansas to perform the necessary analyses. Nonetheless, the central issue in this report is the distribution of quality across Kansas school districts as a central equity and relative adequacy concern.

Table 32
Percentages of Public School Teachers Receiving their Bachelors' Degrees from Selective and Less Selective Undergraduate Institutions by State (from SASS '99)

STATE	Less Selective (0 to 3)	Highly or Most Selective (4 & 5)	RANK	Less Selective (0 to 3)	More Selective (3 to 5)	RANK
Alabama	98.6	1.4	41	92.0	8.0	47
Alaska	93.2	6.8	21	75.5	24.6	21
Arizona	96.5	3.5	33	87.9	12.1	41
Arkansas	98.6	1.4	40	81.6	18.4	27
California	87.1	12.9	5	73.1	26.9	13
Colorado	91.9	8.1	18	73.1	26.9	20
Connecticut	87.3	12.8	6	67.6	32.4	24
Delaware	96.7	3.3	35	47.8	52.2	2
District of Columbia	94.7	5.3	27	88.2	11.8	43
Florida	81.5	18.6	2	61.0	39.0	9
Georgia	95.4	4.6	29	75.3	24.8	26
Hawaii	93.3	6.7	22	31.5	68.5	1
Idaho	91.1	8.9	16	82.9	17.1	34
Illinois	90.5	9.5	14	76.7	23.4	33
Indiana	98.4	1.6	39	78.5	21.5	30
Iowa	99.2	0.8	49	72.7	27.3	15
Kansas	**98.6**	**1.4**	**42**	**86.0**	**14.0**	**36**
Kentucky	99.2	0.8	48	90.4	9.6	46
Louisiana	98.2	1.8	38	82.3	17.8	35
Maine	92.5	7.5	19	86.2	13.8	37
Maryland	90.1	9.9	13	54.8	45.2	4
Massachusetts	82.6	17.4	3	65.4	34.6	5
Michigan	96.2	3.8	32	78.2	21.8	22
Minnesota	93.3	6.7	23	66.9	33.1	8
Mississippi	99.1	0.9	46	96.5	3.5	50
Missouri	90.9	9.1	15	73.5	26.5	12
Montana	97.9	2.1	36	93.6	6.4	48
Nebraska	99.1	1.0	45	91.2	8.8	45
Nevada	92.5	7.5	20	67.2	32.8	11
New Hampshire	89.4	10.6	12	78.6	21.4	32
New Jersey	87.9	12.1	7	66.4	33.6	10
New Mexico	95.1	4.9	28	88.2	11.8	42
New York	88.0	12.0	8	72.0	28.0	17
North Carolina	88.1	11.9	9	82.6	17.4	38
North Dakota	99.9	0.1	51	75.7	24.3	29
Ohio	98.7	1.3	43	73.9	26.1	25
Oklahoma	96.6	3.4	34	73.2	26.9	18
Oregon	95.6	4.4	30	69.4	30.7	6
Pennsylvania	93.9	6.1	26	69.9	30.1	14
Rhode Island	88.7	11.3	10	85.0	15.0	40
South Carolina	91.5	8.5	17	71.7	28.3	16
South Dakota	99.1	0.9	47	95.7	4.3	49
Tennessee	98.8	1.2	44	87.7	12.3	39
Texas	93.4	6.6	25	76.9	23.1	31
Utah	69.3	30.7	1	66.2	33.8	7
Vermont	89.0	11.0	11	75.9	24.1	28
Virginia	84.3	15.7	4	73.0	27.0	23
Washington	93.4	6.6	24	57.5	42.5	3
West Virginia	99.3	0.7	50	97.3	2.7	51
Wisconsin	98.0	2.0	37	71.9	28.1	19
Wyoming	96.2	3.8	31	90.8	9.2	44

Data Sources: This table is part of ongoing research of Bruce D. Baker and Jill Dickerson on the distribution of teachers by specific quality indicators in public, private and charter schools, under different state policy and "supply" contexts. Data used for preparing this table may be accessed by special "restricted use" license from the National Center for Education Statistics and may not be furnished directly by the authors. Undergraduate institution selectivity drawn from Barrons' Guide to the Most Selective Colleges.

Table 33
Mean Percent Poverty of Schools in Which Teachers from Less and More Selective Undergraduate Institutions Teach, by State (SASS '99).

STATE	Less Selective (0 to 3)	More Selective (3 to 5)	Poverty Gap (District)	Rank	Less Selective (0 to 3)	More Selective (3 to 5)	Poverty Gap (School)	Rank
Alabama	21.7%	16.4%	5.2%	49	47%	38%	9.1%	50
Alaska	13.5%	14.1%	-0.6%	6	39%	38%	0.9%	10
Arizona	19.2%	19.9%	-0.7%	5	47%	42%	5.1%	36
Arkansas	22.2%	18.7%	3.5%	45	48%	43%	4.5%	32
California	18.8%	18.4%	0.4%	17	47%	43%	4.5%	31
Colorado	13.5%	10.6%	2.9%	41	29%	18%	11.3%	51
Connecticut	11.1%	9.6%	1.5%	31	24%	22%	2.3%	18
Delaware	12.9%	11.4%	1.4%	30	32%	30%	2.4%	23
District of Columbia					70%	70%	-0.1%	8
Florida	17.5%	18.4%	-1.0%	3	43%	43%	0.5%	9
Georgia	21.8%	20.3%	1.6%	32	46%	39%	6.6%	43
Hawaii					37%	39%	-2.0%	6
Idaho	14.0%	13.4%	0.6%	19	36%	35%	1.6%	14
Illinois	12.8%	13.0%	-0.1%	10	31%	34%	-3.6%	4
Indiana	11.9%	11.6%	0.2%	14	25%	24%	1.0%	11
Iowa	12.1%	10.6%	1.6%	33	28%	26%	2.3%	19
Kansas	**14.5%**	**12.6%**	**1.9%**	**36**	**33%**	**28%**	**5.6%**	**38**
Kentucky	20.2%	18.5%	1.6%	34	43%	42%	1.2%	12
Louisiana	21.0%	20.8%	0.2%	12	57%	55%	2.4%	22
Maine	12.4%	11.5%	0.9%	22	32%	27%	4.6%	33
Maryland	11.1%	12.4%	-1.3%	2	27%	33%	-5.6%	2
Massachusetts	13.8%	10.4%	3.4%	44	26%	19%	7.8%	46
Michigan	14.6%	15.1%	-0.5%	8	29%	25%	3.5%	29
Minnesota	11.3%	8.6%	2.7%	39	29%	26%	3.4%	28
Mississippi	21.5%	20.6%	0.9%	23	61%	55%	6.3%	42
Missouri	14.5%	13.4%	1.1%	27	34%	34%	-0.2%	7
Montana	18.0%	18.0%	0.0%	11	36%	33%	3.4%	27
Nebraska	10.0%	8.6%	1.3%	28	32%	30%	2.6%	24
Nevada	12.5%	12.2%	0.4%	16	34%	41%	-6.5%	1
New Hampshire	8.0%	7.1%	1.0%	25	17%	12%	4.9%	34
New Jersey	9.6%	12.1%	-2.5%	1	24%	21%	3.2%	26
New Mexico	26.3%	23.8%	2.5%	38	66%	57%	8.3%	49
New York	19.2%	15.4%	3.7%	47	37%	31%	5.2%	37
North Carolina	16.3%	15.9%	0.4%	15	41%	33%	7.7%	45
North Dakota	15.6%	14.8%	0.8%	21	34%	32%	1.8%	15
Ohio	12.2%	11.1%	1.0%	26	27%	30%	-2.3%	5
Oklahoma	22.0%	19.0%	3.0%	43	50%	42%	7.8%	47
Oregon	13.2%	12.7%	0.4%	18	37%	34%	2.4%	21
Pennsylvania	13.4%	9.8%	3.7%	46	28%	22%	6.2%	41
Rhode Island	15.0%	15.9%	-0.9%	4	30%	28%	2.0%	16
South Carolina	19.7%	18.7%	0.9%	24	43%	35%	8.3%	48
South Dakota	15.2%	15.7%	-0.5%	7	40%	44%	-4.2%	3
Tennessee	16.0%	14.7%	1.3%	29	44%	42%	2.3%	20
Texas	20.2%	16.4%	3.8%	48	46%	40%	5.6%	39
Utah	10.4%	9.6%	0.7%	20	31%	27%	3.6%	30
Vermont	9.7%	10.1%	-0.4%	9	25%	22%	3.0%	25
Virginia	15.5%	12.7%	2.8%	40	34%	29%	4.9%	35
Washington	14.2%	11.9%	2.3%	37	36%	29%	6.9%	44
West Virginia	21.0%	18.1%	2.9%	42	47%	45%	2.3%	17
Wisconsin	9.9%	9.7%	0.2%	13	21%	20%	1.5%	13
Wyoming	12.2%	10.4%	1.8%	35	31%	25%	5.9%	40

Data Sources: This table is part of ongoing research of Bruce D. Baker and Jill Dickerson on the distribution of teachers by specific quality indicators in public, private and charter schools, under different state policy and "supply" contexts. Data used for preparing this table may be accessed by special "restricted use" license from the National Center for Education Statistics and may not be furnished directly by the authors. Undergraduate institution selectivity drawn from Barrons' Guide to the Most Selective Colleges.

Table 34
Comparison of Current Expenditures per Pupil (1997) and Distribution of Teachers by Undergraduate Selectivity (SASS '99) (Districts with school-aged population exceeding 2,000)

STATE	Less Selective (0 to 3)	More Selective (3 to 5)	Expenditure Gap	Rank
Pennsylvania	$6,294	$6,892	9%	51
Virginia	$5,574	$5,983	7%	50
South Dakota	$4,750	$5,088	7%	49
Montana	$5,028	$5,306	6%	48
Missouri	$5,165	$5,445	5%	47
Georgia	$5,274	$5,538	5%	46
Tennessee	$4,663	$4,889	5%	45
Illinois	$5,576	$5,842	5%	44
North Carolina	$4,949	$5,161	4%	43
New York	$8,658	$9,027	4%	42
New Mexico	$4,478	$4,663	4%	41
Ohio	$5,408	$5,630	4%	40
Kansas	**$5,216**	**$5,418**	**4%**	**39**
Nebraska	$5,422	$5,614	4%	38
Massachusetts	$7,015	$7,262	4%	37
Delaware	$7,157	$7,381	3%	36
Louisiana	$4,543	$4,681	3%	35
New Hampshire	$5,739	$5,910	3%	34
Kentucky	$5,454	$5,612	3%	33
Michigan	$6,469	$6,641	3%	32
Oregon	$5,789	$5,894	2%	31
California	$5,426	$5,512	2%	30
South Carolina	$5,067	$5,142	1%	29
Iowa	$5,390	$5,464	1%	28
Maryland	$6,374	$6,460	1%	27
Idaho	$4,286	$4,337	1%	26
Wisconsin	$6,623	$6,691	1%	25
Alabama	$4,655	$4,698	1%	24
Florida	$5,144	$5,185	1%	23
Connecticut	$8,282	$8,347	1%	22
Colorado	$5,102	$5,132	1%	21
Washington	$5,641	$5,658	0%	20
District of Columbia	$8,048	$8,048	0%	18
Hawaii	$5,774	$5,774	0%	19
Arizona	$4,379	$4,376	0%	17
Rhode Island	$7,478	$7,450	0%	16
Wyoming	$5,686	$5,656	-1%	15
Indiana	$5,993	$5,959	-1%	14
Maine	$6,206	$6,169	-1%	13
Texas	$4,957	$4,927	-1%	12
Oklahoma	$4,502	$4,428	-2%	11
Mississippi	$4,074	$3,998	-2%	10
Nevada	$5,080	$4,979	-2%	9
Arkansas	$4,688	$4,589	-2%	8
Utah	$3,901	$3,813	-2%	7
Alaska	$7,563	$7,376	-2%	6
Vermont	$7,366	$7,160	-3%	5
Minnesota	$5,732	$5,568	-3%	4
North Dakota	$4,358	$4,167	-4%	3
West Virginia	$6,043	$5,733	-5%	2
New Jersey	$9,607	$9,059	-6%	1

Data Sources: This table is part of ongoing research of Bruce D. Baker and Jill Dickerson on the distribution of teachers by specific quality indicators in public, private and charter schools, under different state policy and "supply" contexts. Data used for preparing this table may be accessed by special "restricted use" license from the National Center for Education Statistics and may not be furnished directly by the authors. Undergraduate institution selectivity drawn from Barrons' Guide to the Most Selective Colleges.

Analysis of Teacher Distribution by PRAXIS Scores in Kansas[73]

This teacher distribution analyses uses data on Kansas teachers' own test scores on PRAXIS, and a variety of district characteristics, to determine whether some districts are more likely than others to have teachers with higher, or lower PRAXIS scores. Again, recall that prior economic research identifies a connection between teacher test scores and the performance of their students.

Data were merged from three separate sources to construct the analyses. First, data on the outcome measure, teacher *Praxis* scores were acquired at the teacher level for teachers hired in Kansas districts over a 10 year period (1990 to 2000, N = 16,714). Teacher *Praxis* scores were then merged with district level characteristic and financial data. District geographic classifications and median family income were accessed through the Common Core of Data (School Year 1995 - 96), provided by the *National Center for Education Statistics.* District Adjusted Current Expenditures per Pupil for 1996 - 97 were also acquired from the National Center for Education Statistics and are part of the Common Core of Data, but were acquired by request. Adjusted current expenditures per pupil are adjusted to account for regional differences in the cost of education using a Chambers' cost of education index. Finally, district enrollments and percentages of students at-risk were acquired through the Kansas State Department of Education where the definition of "at-risk" is qualifying for free lunch status.

Four general models were estimated to each of three outcome measures - reading, writing and math *Praxis* score. The first set of models considers only the locale of the district. Locale variables are coded as dummy variables (1 = yes, 0 = no) across 6 categories used in the CCD - (1) large city (N = 0), (2) mid-size center city (N = 4), (3) rural (N = 248), (4) small town (N = 40), (5) urban fringe of large city (N = 3), (6) urban fringe of mid-size city (N = 5). Because there are no "large city" districts in the state of Kansas using the CCD coding system, that classification is dropped. Each model subsequently uses "mid-size central city" as the basis for comparison.

The second set of models adds the median family income measure in order to assess the extent to which community economic characteristics influence teacher choices. This measure can take on at least two meanings. First, the economic condition of the community may directly influence teacher choices by serving as an indicator of the quality of living in the community. That is, higher quality teachers may desire to teach and live in an economically prosperous area. It is feasible to also presume, however, that where salaries are generally depressed, that teachers may choose not to teach and live in or around high-income communities because of the relative cost of living. Second, high median family income may, to some extent, serve as an indirect indicator of the local district's capacity to pay higher salaries, as communities with higher income tend to choose to spend more on public services. Kansas, however, places strict limitations on local community's ability to supplement school revenues.

The third set of models simply integrates the district size, or enrollment measure in an effort to capture differences by size within locale classifications and also to control for district size in assessing the relationship between income and teacher quality. It is important to note that district size may also have a confounding effect in Kansas in that

[73] Excerpted from unpublished working paper by Bruce D. Baker

the school funding formula provides an aggressive weighting to compensate small districts for "diseconomies of scale." The state provides as much as 214% of the basic per pupil allotment for the states smallest districts (enrollment <100).

The final set of models includes a direct measure of fiscal resources - adjusted expenditures per pupil - and a measure of the percent of students classified as "at-risk." Median family income is dropped from this model because of (a) the fact that median family income is generally a strong predictor of available revenues for education and (b) it is largely redundant with the "at-risk" measure, which is determined according to federal Title I guidelines.

Table 35 displays the estimates for each of the twelve equations (4 models by 3 outcomes). In the first set of models, urban fringe locations tend to attract teachers with higher scores across the board than mid size center cities. This relationship holds true for writing and math scores across the second and third models, but not the fourth model. Rural districts appear to attract teachers with lower reading scores, but higher math scores than mid size center cities. This relationship holds true as well for the second and third model.

In the second and third models, median family income is a positive predictor of teacher reading score, indicating that on average, districts with higher median family income tend to have higher teacher reading *Praxis* scores. In the second model, writing scores are also positively associated with median family income.

The third and fourth models indicate the larger school districts tend to have teachers with higher average reading and writing scores. Despite the significance of median family income as a predictor of *Praxis* scores, adjusted expenditures per pupil are generally not a strong predictor of teacher reading, writing or math scores. The implication is that while income influences teacher choices, it does not do so by way of influencing school resources. This outcome may be particular to states such as Kansas, which impose strict restrictions on raising local revenues. **As seen in the final model, one way in which community income does influence teacher choices is that teachers with higher scores in reading, writing or math tend not to teach in districts with higher percentages of at risk pupils.**

Table 35
Predictors of Average Teacher Scores on Praxis - Reading, Writing & Math

	Model 1 (Locale Only)			Model 2 (Locale & Income)			Model 3 (Locale, Size & Income)			Model 4 (Locale, Resources, Size & At-Risk)		
	Reading	**Writing**	**Math**	**Reading**	**Writing**	**Math**	**Reading**	**Writing**	**Math**	**Reading**	**Writing**	**Math**
Locale (CCD)												
Large City (N = 0)												
Mid Size Center City												
Urban Fringe Large City	0.433 **	0.629 ***	1.190 ***	0.008	0.410 **	0.977 ***	0.165	0.572 ***	0.929 ***	-0.415	-0.022	0.174
Urban Fringe Mid Size City	-0.554 **	0.035	0.085	-0.549 **	0.037	0.087	-0.287	0.308	0.006	-0.269	0.333 *	0.010
Large Town	0.243	0.281	1.250 **	0.108	0.212	1.190 **	0.706	0.829 **	1.000 *	0.408	0.605 *	0.598
Small Town	-0.515 ***	-0.039	0.440 **	-0.545 ***	-0.053	0.425 **	-0.072	0.434 ***	0.279	-0.228	0.343 **	0.068
Rural	-0.607 ***	-0.140	0.624 ***	-0.593 ***	-0.132	0.630 ***	-0.032	0.447 ***	0.457 **	-0.313	0.237	0.111
Median Family Income (ln)				**0.759** ***	**0.391** **	**0.374**	**0.567** **	**0.193**	**0.433** *			
Enrollment (ln)							0.190 ***	0.196 ***	-0.059	0.294 ***	0.292 ***	0.044
Adjusted Expenditures per Pupil (ln)										0.261	0.499 *	0.282
Percent At Risk										**-0.024** ***	**-0.019** ***	**-0.026** ***
Constant	178 ***	180 ***	176 ***	172 ***	172 ***	176 ***	172 ***	172 ***	176 ***	176 ***	170 ***	178 ***
R-Squared	0.179	0.149	0.140	0.211	0.165	0.147	0.242	0.226	0.150	0.280	0.285	0.204
Adj. R-Squared	0.165	0.135	0.126	0.195	0.122	0.130	0.224	0.208	0.130	**0.261**	**0.265**	**0.183**

***p<.01, **p<.05, *p<.10
Data File: PRAXIS File merged with financial and demographic data on Kansas districts

VII. FUNDING AND STUDENT OUTCOMES IN KANSAS

This section provides statistical tests of the association between funding differences across Kansas school districts and student outcome differences across those districts. I begin with a review of methodological standards for measuring the relationship between measured schooling inputs and student outcomes. Next, I review the one published, refereed journal article that has measured the relationship between schooling inputs and student outcomes for the state of Kansas. Next, I provide a series of analyses that present the "best possible" approaches to measuring the relationship between schooling inputs and student outcomes in Kansas, given the available data.

A. Production Function Literature

An extensive body of literature in education and economics explores the relationships between different types of schooling inputs and their relationship with student outcomes. The general objective is to discern whether, and to what extent, money matters for improving schooling quality. Some studies measure directly, the relationship between dollar inputs and student outcomes, while others measure the relationship between resources with associated costs like teacher quantity (class size, pupil to teacher ratios etc.), teacher quality (content specialization, degree level, experience etc.) and student outcomes.

With the current mass of accumulated *production function* studies it may be difficult to draw any one conclusion as to exactly how money matters most. The confusion regarding education production function findings that economists like Hanushek use as the basis for arguing that there is no systematic evidence to one effect or the other regarding the "money matters" debate, stems largely from the fact that, to date, so many different methodologies, of varied rigor, have been employed with so many different data sets from varied contexts. As such, summing the findings of earlier, less rigorous analyses, with those of more recent, more advanced analyses with more refined data may not be meaningful.

Studies using rigorous statistical methods to directly test financial input to student outcome relationships in the 1990s, using the National Educational Longitudinal Study of 1988 generally find consistent, small positive, statistically significant relationships between dollar inputs and student outcomes.[74] Further, controlled experimental studies have shown positive effects of class size reduction, a particularly costly reform.[75] These

[74] Harold Weglinsky (1997) School District Expenditures, School Resources and Student Achievement: Modeling the Production Function. In William Fowler (Ed.) Developments in School Finance 1997. Washington, DC: National Center for Education Statistics, Office of Educational Research and Improvement. David N. Figlio (1999) Functional Form and the Estimated Effects of School Resources. *Economics of Education Review* 18 (2) 242-252. Corrine Taylor (1997) Does Money Matter? An Empirical Study Introducing Resource Costs and Student Needs to Educational Production Function Analysis. In William Fowler (Ed.) Developments in School Finance 1997. Washington, DC: National Center for Education Statistics, Office of Educational Research and Improvement.

[75] Jeremy D. Finn and Charles M. Achilles (1999) Tennessee's Class Size Study: Findings, Implications, Misconceptions. *Educational Evaluation and Policy Analysis* 21 (2) 97-109.Barbara Nye, Larry Hedges and Spyros Konstantopoulos (1999) The Long-Term Effects of Small Classes: A Five-Year Follow-Up of the Tennessee Class Size Experiment. *Educational Evaluation and Policy Analysis* 21 (2) 127-142. Brewer, D., Krop, C., Gill, B.P., Reichardt, R. (1999) Estimating the Costs of National Class Size Reductions Under Different Policy Alternatives. Educational

more refined empirical analyses of class size reduction have resolved much of the confusion over the lack of consistent findings from more crude studies testing relationships between pupil to teacher ratios and student outcomes. Finally, the vast body of recent teacher labor market research (discussed in an earlier section) indicates that financial incentives may play a significant role in improving overall teacher quality, and may also play an important role in improving the equity of distribution of quality teachers.

B. Reasons for Studying Input-Outcome Relationships in Kansas

In the current policy context and pending litigation, there are two central reasons for studying the relationship between schooling inputs and student outcomes in Kansas:

1. **Adequacy:** Are Kansas school children being provide with education quality that will allow them to effectively compete with their peers nationally, and around the world? That is, should the Kansas legislature (either proactively or by court order) infuse more money into the school finance formula, and is there any reason to believe that doing so will improve student outcomes?

2. **Equity:** Are some Kansas children, by virtue of the disparities in schooling inputs across Kansas districts, being disadvantaged, as measured by their schooling outcomes? That is, does the dramatic imbalance of emphasis on district versus student needs addressed earlier lead to disadvantages to children in larger districts, especially those serving more low income and minority students? Alternatively, do district-need cost adjustments, like low enrollment weight, bestow and educational advantage on students in districts receiving the largest amounts of that funding?

Adequacy: Research literature on school finance reforms and student outcomes in other states

A growing body of research attempts to test specifically whether state school finance reforms lead to changes in student outcomes, including overall increases or declines in outcomes, or improvement in the equity of student outcomes (e.g. raising the bottom end, though not necessarily "closing the gap."). These studies attempt to test whether new money introduced into low wealth schools via school finance reform, leads to improved outcome levels and improved outcome equity. Like the Tennessee Class Size studies, these studies measure changes over time in student outcomes, and their relationship to changes in state policies. [76]

Evaluation and Policy Analysis 21 (2) 179-192. Harris, D. (2002) Identifying Optimal Class Sizes and Teacher Salaries. In Levin, H.M. & McEwan, P. Cost Effectiveness and Educational Policy. Larchmont, NY: Eye on Education.

[76] For an exceptional overview of this topic, see Thomas Downes (2002) Do State Governments Matter? A Review of the Evidence on the Impact on Educational Outcomes of the Changing Role of the States in the Financing of Public Education. Working Paper, Federal Reserve Bank of Boston.

Whether "school finance reform" as a general concept, leads to improved student outcomes, depends largely on the type of reform implemented.

1. Was there significant new money with the reform, and did that that money lead to more adequate schooling inputs for previously low funded, low performing schools?
2. Did the reform include tax or spending limits, in an effort to enforce equitable inputs (often in conjunction with less emphasis on relative adequacy)?
3. Was the reform proactive or court ordered?

There remains significant debate on the third question. The difficulty with answering the third question is that the effectiveness of reforms appears to be more dependent on the type of reform implemented than on the reason for the reform. Certain types of reforms tend to produce more consistently positive or more consistently negative results regarding long-run spending and outcomes. The literature on reforms including tax limits typically finds that tax limits level down spending and tax limits may level down student performance.[77] In general, Downes and Shaw (1995) show that the stringency of constraints on local discretion determines the effects of reforms on the level and growth of spending.[78] That is, strict revenue limits, like those imposed in SDF, tend to level down.

Downes (2000) makes a strong case for more detailed study of specific reforms, noting the difficulty of comparing or classifying reforms across states. Very recent, empirically rigorous literature on significant state-specific school finance reforms indicates positive results with respect to achievement outcomes. Two recent studies focus on school finance reform in Vermont (Downes, 2003) and in Kentucky (Flanagan and Murray, 2003). In each state, funding to low wealth districts was increased dramatically. In Vermont, Tom Downes (the same economist who co-authored the most technically rigorous existing analysis of the leveling down effect), found that Vermont's school finance reform (Act 60), which significantly increased funding in low property wealth districts, has also led to increased performance outcomes for children from low wealth districts and that performance outcomes have improved more rapidly in low wealth districts than in high wealth districts.[79] Murray and Flanagan found similarly positive achievement effects from Kentucky's education reform act.[80]

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[77] Thomas Downes and David Figlio (1998) School Finance Reforms, Tax Limits and Student Performance: Do Reforms Level Up or Level Down? Working Paper 98-05. Department of Economics, Tufts University.

[78] Thomas Downes and Mona Shah (1995) The effect of school finance reform on th level and growth of per pupil expenditures. Working Paper. Department of Economics, Tufts University.

[79] Thomas Downes (2003) School Finance Reform and School Quality: Lessons from Vermont. Paper presented at the American Education Finance Association annual meeting. Orlando, FL. Note that since Downes' analyses, Vermont has modified Act 60 to increase the foundation level of funding to $6,800 per pupil over the next few years. Downes' study only the effects of the increase to $5,100 per pupi.

[80] Ann Flanagan and Sheila Murray (2003) A Decade of Reform: The Impact of School Reform in Kentucky. Paper presented at the American Education Finance Association annual meeting. Orlando, FL.

In summary, tax limits, like those imposed in Kansas, level down. School finance reforms *per se* do not.[81] Further, school finance reforms that provide additional aid to districts in need (low wealth, need student population etc.) tend to lead toward improved student performance in those districts relative to other districts (VT), or even statewide (KY).

Adequacy: Research literature on school finance reform and student outcomes in Kansas

When Kansas implemented SDF, some new money was added, but since then state spending has lagged significantly, and local districts have been unable to make up the difference. A recent, published economic analysis of the effects of the initial increases in aid produced by SDF through 1995 – 96 found that aid increases were statistically significantly, and relatively strongly associated with increases in academic attainment:

> "Using panel models that, if biased, are likely biased downward, I have a conservative estimate of the impact of a 20% increase in spending on the probability of going on to postsecondary education. The regression results show that such a spending increase raises that probability by approximately 5%."[82]

Tying together (a) Deke's findings on the initial improvement in student outcomes in Kansas, (b) evidence from the previous section of this report chronicling the rapid decline in funding since the data used by Deke and (c) existing evidence on the effects of tax limits and resultant slowed revenue growth on student outcomes, one might expect a substantial decline in the academic preparedness and educational attainment of Kansas students over the next several years, placing Kansas children at a significant disadvantage in the increasingly mobile, national and global economy.

Equity: Constructing a test of whether differences in available financial inputs are associated with differences in student outcomes across Kansas districts

Constructing statistical tests of whether differences in funding across Kansas districts are associated with differences in outcomes first involves establishing methodological standards for how that test is to be performed and then involves surveying the available data to determine which of those standards can be met. Methodological standards should be derived from existing, published empirical research. As noted previously, the theoretical framework for such tests is the education production function, which assumes that student outcomes are a function of (a) student inputs, including both the knowledge and skills with which students enter the system, and family background and environmental variables that may influence both the entry status and rate

[81] See William Evans, Sheila Murray and Robert M. Schwab (1999) The Impact of Court-Mandated School Finance Reform. In Helen F. Ladd, Rosemary Chalk and Janet Hansen (eds) "Equity and Adequacy in Education Finance: Issues and Perspectives." Committee on Education Finance, Commission on Behavioral and Social Sciences and Education, National Research Council.

[82] John Deke (2003) A Study of the impact of public school spending on postsecondary educational attainment using statewide school district financing in Kansas.

of progress, and (b) schooling inputs, like fiscal inputs, or teacher quality, teacher quantity, school facilities etc.

A general set of standards for producing "conservative" estimates of the relationship between fiscal inputs and student outcomes might include:

1. Use of student level outcome data, to avoid "aggregation bias," typically resulting in overstatement of the strength of the relationship between schooling inputs and student outcomes.[83]
2. Use of appropriate student level measures to account for (a) prior performance – or knowledge and skills with which the student entered the school and (b) student background characteristics, including family and environmental characteristics that may influence both a child's entry skills and the rate[84] at which the child advances.
3. Use of statistical methods that reduce bias that may result from endogeneity between locally determined schooling inputs and student outcomes. That is, community socio-economic factors simultaneously influence school spending level choices and student outcomes. Statistical methods, including 2-stage least squares regression (instrumental variables) are available for reducing this bias.[85]

Other methodological issues that may influence the production function findings are (a) the shape, or *functional form* of the relationship between inputs and outcomes (b) whether there is measurement error in the outcome or input variables and (c) whether there is sampling bias in the sample of students whose performance is being measured. Different *functional forms* can be tested to see which form best fits the data (by way of R-squared on within sample data or by way of cross-validation or prediction methods with out-of-sample data). When there is measurement error in the dependent variable – student performance - the typical result is that significance and magnitude of the input-outcome relationship will be understated. When there is measurement error in independent variables, an *errors in variables* (eivreg in STATA) method can be used. When using high school performance data, the fact that high school performance can only be measured on those who've stayed in school through high school creates sampling bias. Typically, those who drop out would have received lower than average high school test scores, or shown slower than average progress over time. Also, districts serving lower income and minority students tend to have higher dropout rates. As such, inability to control for this sampling bias (via Heckman's selection or endogenous switching models) typically leads to upward bias on performance outcomes in districts serving low income and minority students. In summary, inability to fully account for items (b) and (c) above

[83] Hanushek, Rivken and Taylor (1996) in particular, discuss the role of aggregation (e.g using district or state level data) in creating upward bias of estimates in education production functions. The use of student level data in the analyses herein should limit such bias, yielding conservative estimates. See Eric A. Hanushek, Steven C. Rivken and Lori L. Taylor (1986) Aggregation and the Estimated Effects of School Resources. *Review of Economics and Statistics*

[84] Karl. Alexander, Doris Entwisle and Linda Olsen (2001) Schools, Achievement and Inequality: A Seasonal Perspective. *Educational Evaluation and Policy Analysis* 23 (2) 171-191.

[85] James Dewey, Thomas Husted, Lawrence Kenny (2000) The ineffectiveness of school inputs: A product of misspecification. *Economics of Education Review* 19 (1) 27-45.

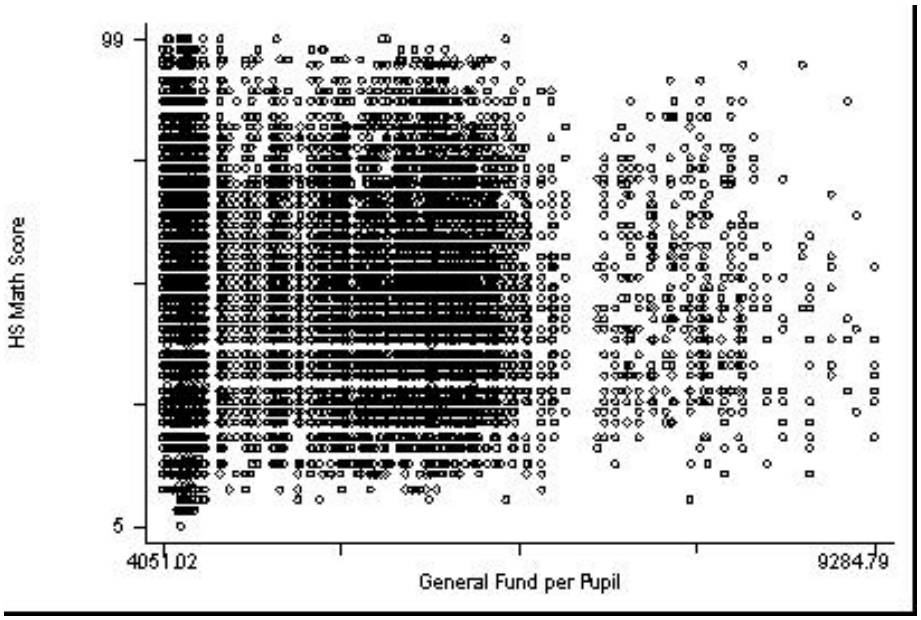
leads to a reduction in the measured magnitude and effect of financial resources on student outcomes.

Perhaps the most important methodological standard stated above is the necessity to, as well as possible, control for student background characteristics. In fact, setting only minimal standards for review of a massive volume of production function studies, Hanushek (1996) notes:

> "**The minimal requirements for acceptance are that studies must include some measures of the family background of students** in addition to the common resource factors and must include information about the statistical significance of the estimates." p. 55[86]

Here I provide a brief explanation for the importance of this particular requirement. Figure 22 displays the "bivariate" (one independent, one dependent variable) XY scatterplot of the relationship between district General Fund Budgets per pupil and 10th grade math scores for all Kansas students in 2001. The correlation between the variables is 0.0168 and is statistically significant. This finding, however, has limited meaning for multiple reasons. One the one hand, this analysis may significantly overstate or understate the relationship between inputs and outcomes if certain types of children disproportionately attend districts with larger or smaller general fund budgets.

Figure 22
Scatterplot of the relationship between General Fund Budgets and 10th Grade Math Scores

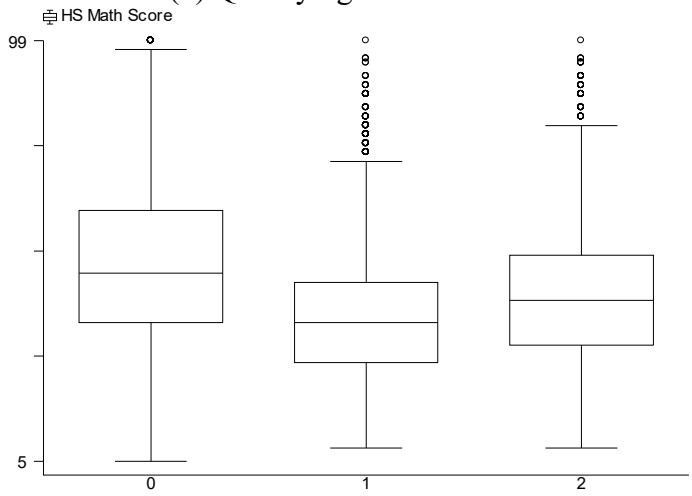


Correlation = 0.0168 (p<.05)

[86] Eric A. Hanushek (1996) School Resources and Student Performance. In Gary Burtless (ed.) pp. 43-73 Does Money Matter? The Effective of School Resources on Student Achievement and Adult Success. (Washington, DC: Brookings Institution Press).

For example, if we are comparing large Kansas districts (which serve most of the dots in the picture, thus most strongly influence the correlation), there might be little difference in general fund budget between large districts with very few children in poverty (Blue Valley) and large districts with a majority of their children in poverty (Kansas City). Yet, Figure 23 indicates that among the same group of students in Figure 22, average performance of children qualifying for free or reduced price lunch is much lower than that of other students. The result is that while general fund budgets will vary little across these districts, performance may vary a lot, implying inappropriately that such wide variations in achievement can be accomplished with such similar funding, as if all else were equal. That is, implying that the low performing districts with the same general fund budget should be able to produce the same outcomes as the high performing district with that general fund budget. Extending this example, if we include Federal Title I aid in the analysis, but still fail to account for student background characteristics, we might see that the "higher funded" districts perform less well, if the additional funding is not yet sufficient to close the gap between children from low vs. middle income households.

Figure 23
High School Math Scores of Non-low-income (0), Free Lunch (1) and Reduced Lunch (2) Qualifying Students



A second, statistical problem with the correlation presented in Figure 22 is that that correlation assumes that both student outcomes and financial inputs are "free to vary" across all students, when in fact, the students are clustered into schools and districts, whereby each district has a set budget per pupil. That is, district general fund budgets may vary only across the 304 (2001) districts in the state, while test scores may vary across the approximately 30,000+ students taking the test in a given year. Failure to adjust "standard" errors in such statistical analyses may result in overstatement of statistical significance, like finding that the relatively small correlation coefficient in Figure 22 is statistically significant at $p<.05$.

C. Equity: Tests of the relationship between key schooling inputs and student outcomes in Kansas

This subsection presents findings of several statistical tests of the relationship between differences in funding across Kansas districts and differences in student outcomes. Unfortunately, due primarily to the inadequacies of Kansas state assessment data, it was infeasible to adhere to one of the methodological standards stated above – the need to account for prior student level performance – or the need to measure student level value added. Other standards were attainable. For example:

1. Student level data on outcomes were merged with district level data on finances and economic conditions in an effort to reduce aggregation bias. Further, robust standard errors, accounting for the clustering of students in districts, were then calculated in order to produce conservative estimates of statistical significance.
2. Student level data on (a) free or reduced price lunch status (b) language proficiency status and (c) disability status were either used as covariates, in some models, or used as a basis for excluding children from the sample such as to reduce the sample to "comparable groups," in other models.
3. Bias that may result from endogeneity of revenue variables, like total revenues per pupil or local option budgets per pupil which may be influence by local voter preferences and economic capacity, was controlled for via two stage least squares estimation.

Table 37 presents the findings from a previous report which focused specifically on the outcome equity effects of low enrollment weighting. That is, do differences in revenues that result specifically from low enrollment weighting, bestow and educational advantage on students in districts that receive more of that weighting? The complete production function model underlying the findings presented in Table 37 may be specified as follows:

$$\mathbf{Score_{ij} = \mathit{f}\ (STUDENT\ [Poverty_{ij}\ ,\ ELL_{ij},\ Disability_{ij}],\ RESOURCE_j\ [LOB_j\ ,\ LEW_j,\ OTHSTU_j\ ,\ OTHDIS_j])}$$

That is, test scores (of student "i" in district "j") at each grade level, for 1997, 1999 and 2001 across math and reading content areas, were predicted in 72 separate regression analyses of 18 different hypothesis tests (counted as 36, if alternative samples – with and without special education students – are counted) as a function of student background characteristics including poverty status (Poverty = free or reduced lunch status of student "i" in district "j"), language proficiency status (ELL, or English language learner) and disability status, and components of the school finance formula that create variation in financial resources across districts, including local option budgets (LOB), low enrollment weight (LEW), other student need weights (OTHSTU, including at risk, bilingual and vocational) and other district weights (including transportation and new facilities). Local option budgets, being endogenous to community preferences for education quality, were instrumented with measures of median family income, tax price and percent of adults

over 65 years of age.[87] Again, the goal was to isolate the variance in school district revenues associated with low enrollment weighting, and test whether that variance was associated positively with student outcomes.

Table 37 reports only the direction (positive or negative) and statistical significance of the relationships between the low enrollment weight variable and student outcomes, because low enrollment weight, and the outcome equity effects of that weight alone were a primary concern of the previous report. They remain central concerns of this report given the consistency of findings in Table 37 and subsequent analyses.

The biggest shortcoming of the available data was the inability to control effectively for students' prior performance, via individual student level value added outcome measures. The ability to run separate regression analyses on multiple years of data, and different grade levels of data, however, allows us to see some emerging trends.[88] For example, at the elementary school level, in 1997 and 1999 there are no, or negative relationships between low enrollment weighting and student performance. But by 2001, those relationships appear to be turning positive. That is, over time, as larger districts have been "squeezed," (e.g. leveling down as larger districts increasingly reach their revenue cap) for funding, smaller districts receiving low enrollment aid have begun to achieve an advantage in student performance by the lower grades, where an advantage did not previously exist.

The most striking, and important trend however, is that by high school (10th grade math or 11th grade reading) all coefficients are positive and statistically significant. In elementary school, few are marginally significant. In middle school, many are statistically significant. This suggests that students attending districts receiving more low enrollment aid have a cumulative performance advantage over time. That is, low enrollment aid contributes positively and significantly to educational value added over time.

[87] Based on a "median voter" framework (see previous section on economies of scale weight) of local determinants of education spending. See for example, J.M. Poterba (1997) Demographic structure and the political economy of public education, Journal of Policy Analysis and Management 16 (1) 48-66. Amy Harris, William Evans, Robert Schwab (1999) Education Spending in an Aging America. Working Paper. Department of Economics, University of Maryland, College Park. Edward M. Gramlich and Daniel Rubinfeld (1982) Micro Estimates of Public Spending Demand Functions and Tests of the Tiebout and Median-Voter Hypotheses. Journal of Political Economy 90 (3) 536-560

[88] In effect, the changes over time are the equivalent of status change comparisons as discussed in a previous section, but these status change comparisons have the advantage of controlling for a variety of other student background and schooling resource characteristics not used in QPA comparisons.

Table 37
Is higher low enrollment weighting specifically associated with high student outcomes at all grade levels and over time[89]

	Elementary			Middle			High		
	1997	**1999**	**2001**	**1997**	**1999**	**2001**	**1997**	**1999**	**2001**
Reading									
with special ed									
OLS	0	0	0	+	0	+	+	+	+
2SLS	0	0	+ (m)	+	0	+	+	+	+
without special ed									
OLS	0	0	0	+	0	+	+	+	+
2SLS	0	0	+ (m)	+	0	+	+	+	+
Math									
with special ed									
OLS	0	- (m)	+ (m)	0	0	+ (m)	+	+	+
2SLS	0	0	+ (m)	+	0	+	+	+	+
without special ed									
OLS	0	- (m)	+ (m)	+ (m)	0	+ (m)	+	+	+
2SLS	0	- (m)	+ (m)	+	0	+	+	+	+

- = negative statistically significant relationship (p<.05)
- (m) = negative, marginally significant relationship (p<.10)
0 = no statistically significant relationship
+ (m) = positive, marginally significant relationship (p<.10)
+ = positive statistically significant relationship (p<.05)

Given the findings in Table 37, that outcome differences emerge most strongly at the high school level with respect to low enrollment weight, coupled with the fact that we cannot measure directly student gains with available Kansas data, it is perhaps most important from this point on to focus on the relationship between available funding levels and the performance of Kansas school-children as they near their departure from the K-12 schools. As such, subsequent analyses in this section focus specifically on high school level tests, concatenating cohort data from 1997, 1999 and 2001 cohorts separately for math and reading, and the relationship between funding differences and high school performance. Recall that the focus on high school tests, without the ability to control for selection bias due to dropping out, may inflate performance in districts serving more low income and minority students.

Analyses performed after the analyses in Table 37 indicated that race was a significant contributor to student outcomes above and beyond poverty status. These findings are reported in a later section. Because district racial composition is related with district size, and therefore low enrollment weight, inclusion of race as an additional student background variable may influence the relationship between low enrollment weight, or other revenue variables and outcomes. As such, all subsequent tests of input-outcome relationships include indicators of race in addition to poverty:

[89] Note that one of Herb Walberg's concerns (his footnote #32) regarding the structure of my analysis, is my failure to control for prior achievement, so as to estimate school effects on individual student value added, rather than level of performance. I discuss at a later point in this report how this is more a failure of the state testing system, than of my analysis. In this case, I have tried to at least perform the analyses on multiple years of data in order to reveal the increased relationship between low enrollment aid and student outcomes as students progress to higher grade levels.

$$Score_{ij} = f\,(STUDENT\,[\mathbf{Race_{ij}}, Poverty_{ij}, ELL_{ij}, Disability_{ij}], RESOURCE_j\,[LOB_j, LEW_j, OTHSTU_j, OTHDIS_j])$$

Table 38 presents the findings from various iterations of the above model, applied to math and reading assessments from Kansas high school students, from 1997, 1999 and 2001. Financial resource variables were calculated as the averages of those resources over the period from 1996 to 2000, so as to represent stable estimates of resource variation across districts.

Of primary interest are whether general resource measures like (a) total revenues per pupil and (b) general and supplemental fund revenues per pupil are positively associated with student outcomes, and even more importantly if measures associated with equity concerns raised throughout this report, like (a) local option budgets per pupil and (b) low enrollment weight are positively associated with student outcomes. When considering aggregate revenue measures like total revenues or general and supplemental fund revenues combined, attempts were made to account for the independent effects of district scale on student outcomes.

In the first regression in the table, the resource measure – *total revenues per pupil* - which includes all federal state and local revenues per pupil (including those for capital outlay etc.), is only marginally significant ($p<.10$) when associated with math outcomes, but statistically significant ($p<.05$) when associated with reading outcomes.

When general fund budgets and local option budgets are considered either together, or separately, both are statistically significantly, positively associated with student performance outcomes. This is the case for both reading and math scores. **That is, students in districts with larger general and supplemental fund budgets per pupil do better on state assessments at the high school level, and students with either larger general fund budgets or larger supplemental fund budgets do better on state assessments at the high school level.**

The next regressions break out the sources of variance underlying general fund budgets, including (a) low enrollment weight, (b) other district weights and (c) student and program weights. **When general fund variance components are decomposed, local option budgets per pupil are positively associated with student outcomes, and low enrollment weight is consistently, positively associated with student outcomes. That is students attending districts with either higher local option budgets per pupil or more low enrollment aid per pupil tend to have higher scores on high school level math and reading assessments.**

Finally, Table 38 includes tests of the interaction between low enrollment weight and indicators of whether a child is Black or Hispanic. Inclusion of the interaction terms tests the hypothesis of whether Black or Hispanic children in districts receiving more low enrollment aid perform better on state assessments. That is, can additional aid, like low enrollment aid, help close the Black-White, or Hispanic-White achievement gap? **In fact, the coefficient for the Black-White achievement gap is -.26, and statistically significant. The coefficient on the interaction term between Black and low enrollment aid is +.32, indicating that 1 unit higher low enrollment aid for black**

students is associated with enough achievement gain to offset the entire Black-White achievement gap.[90]

[90] When linear, rather than log-log regressions are run for this particular model, the black-white achievement gap is typically about 10 points (coefficient on Black = -10) and the coefficient on the interaction term between black and low enrollment weight generally exceeds +10. The implication is that a 1.0 unit increase in low enrollment aid is associated with a 10 point higher score on state high school math assessments for Black students.

Table 38

		10 Grade Math Assessments 1997, 1999, 2001					
		N=71,377 C=297	N=71,377 C=297	N=69,992 C=278	N=69,992 C=278	N=69,992 C=278	N=69,992 C=278
		Estimate Sig.	Estimate Sig.	Estimate Sig.	Estimate Sig.	Estimate Sig.	Estimate Sig.
Revenue Variable							
Total Federal State and Local Revenue per Pupil (natural log)	i	0.12 *					
General Fund and Local Option Budget per Pupil (natural log)	i		0.72 ***				
Decomposition of State Revenue							
General Fund Budget per Pupil (natural log)				0.18 ***			
Local Option Budget per Pupil (natural log)	i			0.09 ***	0.07 ***	0.08 ***	0.08 ***
Low Enrollment Weight Ratio					0.11 ***	0.11 ***	0.11 ***
Other District Weight Ratio					0.03	0.04	0.04
Student/Program Weight Ratio					-2.02 ***	-2.07 ***	-2.05 ***
Federal Aid per Pupil (natural log)						0.00	0.00
District Characteristics							
Scale (natural log of enrollment)		-0.09	0.38 **				
Scale squared (natural log of enrollment, squared)		0.01	-0.02 **				
Student Characteristics							
Poverty Status							
Qualifies for Free Lunch		-0.17 ***	-0.17 ***	-0.17 ***	-0.15 ***	-0.15 ***	-0.15 ***
Qualifies for Reduced Price Lunch		-0.10 ***	-0.10 ***	-0.09 ***	-0.09 ***	-0.09 ***	-0.09 ***
Race/Ethnicity							
Black		-0.27 ***	-0.27 ***	-0.27 ***	-0.23 ***	-0.23 ***	-0.26 ***
Hispanic		-0.19 ***	-0.19 ***	-0.19 ***	-0.15 ***	-0.15 ***	-0.15 ***
Interactions with Race and Low Enrollment Aid							
Black							0.32 ***
Hispanic							-0.03
Test Administration/Time Fixed Effect							
1999		0.05 ***	0.05 ***	0.04 ***	0.04 ***	0.04 ***	0.04 ***
2001		0.14 ***	0.13 ***	0.14 ***	0.14 ***	0.14 ***	0.14 ***
Constant		2.97 ***	-4.16 *	1.63 ***	3.30 ***	3.28 ***	3.28 ***
R-squared		0.10	0.09	0.08	0.10	0.10	0.10

(i) indicates instrumented revenue variables. Instruments included median family income, tax price and percent of population over 65yrs of age.
All revenue variables are calculated as 5 year averages from 1996 to 2000
*p<.10, **p<.05, ***p<.01

Table 38 cont'd

	10/11th Grade Reading Assessments 1997, 1999, 2001					
	N=72,509 C=297	N=72,509 C=297	N=70,706 C=278	N=70,706 C=278	N=70,706 C=278	N=70,706 C=278
	Estimate Sig.	Estimate Sig.	Estimate Sig.	Estimate Sig.	Estimate Sig.	Estimate Sig.
Revenue Variable						
Total Federal State and Local Revenue per Pupil (nati	0.08 **					
General Fund and Local Option Budget per Pupil (nat i		0.34 ***				
Decomposition of State Revenue						
General Fund Budget per Pupil (natural log)			0.09 ***			
Local Option Budget per Pupil (natural log) i			0.05 ***	0.04 ***	0.04 ***	0.04 ***
Low Enrollment Weight Ratio				0.06 ***	0.06 ***	0.06 ***
Other District Weight Ratio				-0.01	0.01	0.01
Student/Program Weight Ratio				-0.63 *	-0.71 *	-0.70 ***
Federal Aid per Pupil (natural log)						
District Characteristics						
Scale (natural log of enrollment)	-0.05 *	0.16 **				
Scale squared (natural log of enrollment, squared)	0.00 **	-0.01 *				
Student Characteristics						
Poverty Status						
Qualifies for Free Lunch	-0.10 ***	-0.10 ***	-10.00 ***	-0.09 ***	-0.09 ***	-0.09 ***
Qualifies for Reduced Price Lunch	-0.05 ***	-0.05 ***	-0.05 ***	-0.05 ***	-0.05 ***	-0.05 ***
Race/Ethnicity						
Black	-0.17 ***	-0.17 ***	-0.17 ***	-0.15 ***	-0.15 ***	-0.16 ***
Hispanic	-0.10 ***	-0.10 ***	-0.10 ***	-0.09 ***	-0.09 ***	-0.09 ***
Interactions with Race and Low Enrollment Aid						
Black						0.14
Hispanic						-0.01
Test Administration/Time Fixed Effect						
1999	0.01	0.01	0.01	0.01	0.01	0.01
2001	0.28 ***	0.28 ***	0.28 ***	0.28 ***	0.28 ***	0.28 ***
Constant	3.62 ***	0.47	3.08 ***	3.88 ***	3.85 ***	3.85 ***
R-squared	0.26	0.25	0.25	0.25	0.25	0.25

(i) indicates instrumented revenue variables. Instruments included median family income, tax price and percent of population over 65yrs of age.
All revenue variables are calculated as 5 year averages from 1996 to 2000
*p<.10, **p<.05, ***p<.01

D. Summary of the Financial Input – Student Outcome Relationship in Kansas

From an adequacy perspective, only one peer reviewed, published study has addressed whether increases in funding resulting from school finance reform in Kansas are associated with improved student outcomes. That study found quite decisively that educational attainment increases with increased funding, as experienced in the earlier years of SDF. From an equity perspective, the regression analyses in this section, which adhere as much as possible to desired methodological standards with presently available data, invariably show that:

a. **Students attending districts with more total revenue per pupil have higher reading test scores at the high school level.**
b. **Students attending districts with either or both more general and supplemental fund revenue score higher on both reading and math tests at the high school level.**
c. **Students attending districts with more low-enrollment aid per pupil or higher local option budgets per pupil have higher test scores at the high school level.**

Of all critical resource measures[91] tested in this section for their relationship with student outcomes at the high school level, only 1 of 20 coefficients was "marginally" statistically significant. All 19 others were statistically significant, with 18 coefficients statistically significant at $p<.01$, using robust standard errors to generate conservative estimates of significance.

[91] Total revenue per pupil, general and supplemental fund budgets per pupil, low enrollment weight and local option budgets per pupil

VIII. DISPARITIES BY RACE

This section reviews the empirical evidence that the Kansas School District Finance Act disparately affects Kansas students by race and national origin. This section begins with an overview of race-based disparities in funding across the states. Next, this section reviews the specific details of race-based disparities in general fund aid per pupil across school districts within the state of Kansas.

A. Overview of National Data on the "Spending Gap"

Using 1997 data from the National Center for Education Statistics (NCES) on cost adjusted current expenditures per pupil, and percentages of children that are minorities, Table 39 indicates that Kansas is among a group of only 5 states where districts with higher percentages of minority students systematically attend school districts that spend less per pupil. One might argue that Kansas (and Nebraska and New Hampshire for that matter) are rural states with relatively small minority populations concentrated exclusively in larger cities, and because economies of scale exist in education, it is logical that the minority students in the state attend lower spending districts. Interestingly, however, the five states with negative coefficients, and 25 states with positive coefficients are not easily classified as rural or urban, or low or high minority population states.

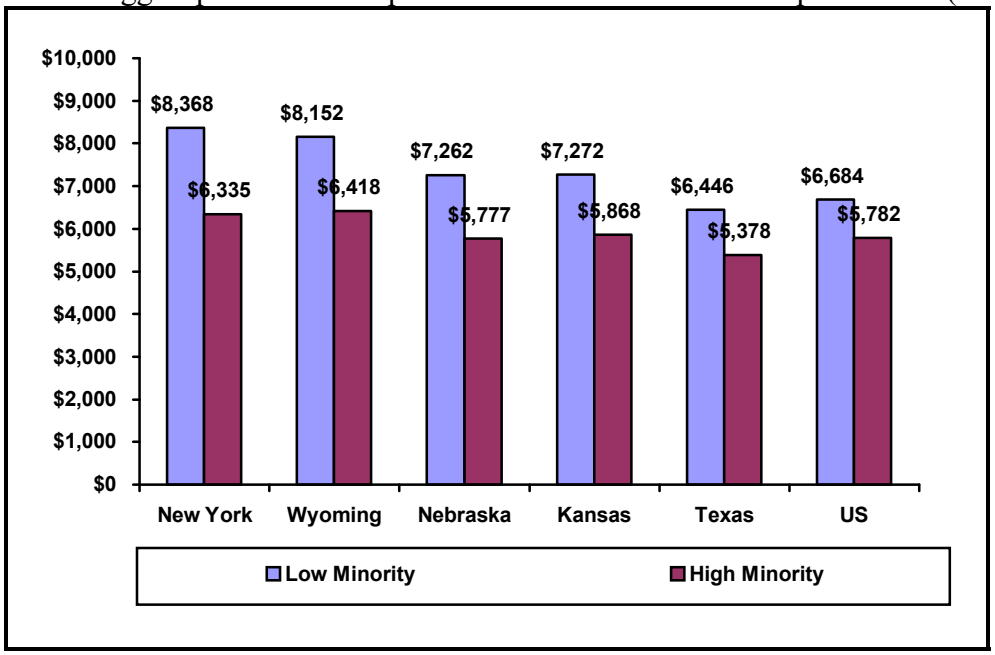
Figure 24 presents the states identified as having the largest disparities in funding between low and high percent minority districts. This figure is adapted from a report prepared by Greg Orlofsky at *The Education Trust* (www.edtrust.org). Using data from 2000, and classifying districts as low and high percent minority, rather than using correlations across all districts, Orlofsky also identifies five states as having the "largest" race based disparities, three of which display negative significant coefficients in Table 39, one of which is **Kansas**.

Table 39
Relationship[1] between Percent Minority Students Enrolled and Adjusted[2] Current Expenditures per Pupil (CCD 1997)
Data Set: R943887.sd2 (SAS)

Positive Significant[3]	Positive Non-significant	Negative Non-significant	Negative Significant
Alaska	Alabama	Iowa	*Kansas*
Arkansas	Colorado	Idaho	Nebraska
Arizona	Delaware	Louisiana	New Hampshire[4]
California	Florida	Nevada	New York[5]
Connecticut	Maryland	Rhode Island	Pennsylvania[6]
Georgia	Maine	Vermont	
Indiana	North Carolina	West Virginia	
Kentucky	Oregon		
Massachusetts	Texas		
Michigan	Virginia		
Minnesota	Washington		
Missouri			
Mississippi			
Montana			
North Dakota			
New Jersey			
New Mexico			
Ohio			
Oklahoma			
South Carolina			
South Dakota			
Tennessee			
Utah			
Wisconsin			
Wyoming			

1) Regression coefficient on "permin97" as independent variable with respect to "adjppe97" as dependent variable with "pop" (population ages 5 – 17) as weight.
2) Where "adjusted" means that per pupil expenditures are adjusted for regional differences in the price of teachers using Chambers Teacher Cost Index.
3) $p<.01$
4) Data immediately prior to State Supreme Court decision to overturn formula (*Claremont Sch. Dist. V. Governor*, 703 A.2d 1353 (N.H. 1997)). Disparities primarily a function of local control.
5) Faced civil rights challenges in federal (*African-American Legal Defense Fund v. New York* 8 F. Supp. 2d 330 (S.D.N.Y. 1998)) and state (*Campaign for Fiscal Equity v. New York* 719 N.Y.S.2d 475 (N.Y.Sup.Ct. 2001)) court. Disparities primarily a function of local control, but related to state aid allocations (pupil count method).
6) Pending federal civil rights challenge (*Powell v. Ridge*, 189 F.3d 387, 399 (3d Cir. 1999)).

Figure 24
States with Biggest per Student Gaps in State and Local Revenues per student (2000)[92]



Source: The Education Trust: Analysis by Greg Orlofsky based on 1999-2000 U.S. Department of Education and U.S. Census Bureau Data.
The Funding Gap: Low Income and Minority Students Receive Fewer Dollars. The Education Trust, August, 2002.

B. Analysis of the Distribution of Funds by Race and National Origin in Kansas

This section presents an analysis of the disparate effects of the school district finance act. This section begins with a statistical and graphic analysis of disparities in general fund revenues per pupil across Kansas districts. Next, this section includes a series of geographic representations of the distribution of funding across Kansas school districts and the distribution of students, African American students, and all minority students.

Analyses of disparate effects focus on disparities in general fund budgets per pupil, or those differences in funding created directly by the pupil weighting system. That is, the analyses that follow focus on the disparate effects of direct legislative actions. It is important to recall that LOB leverage (the cap) is also tied to differences in general fund aid.

[92] Note that Orlofsky's report leaves many questions unanswered, including exactly which poverty measures were used, and how cut-points were established. His findings are included in this report simply because they provide an independent review of similar facts (U.S. Census data) that produce similar findings to my own – That Kansas is among the few states with significant disparities among higher and lower percent minority districts.

Data definitions and sources

Minority Students[93]

1. 1997 data provided by the National Center for Education Statistics include school district aligned estimates of numbers of Black, Asian and Hispanic students and total student populations of school districts. Data file: R943887.sd2
    a. PERMIN97 = Percent of total district population that are Black, Asian or Hispanic
    b. PERBLACK97 = Percent of district population that are Black
2. 2000 – 2001 KSDE school district enrollment data access from the world wide web include district reports of numbers of Black, Asian, Hispanic and Native American Students.
    a. PERMIN01 = percent of total district population that are Black, Asian, Hispanic or Native American
    b. PERBLACK01 = Percent of district population that are Black

General Fund Budgets per Pupil

1. Differences in General Fund Budgets per Pupil across Kansas districts may be represented in either of two ways.
    a. General Fund Budgets per Pupil may be expressed in dollar terms, and calculated as the total general fund budget allocation divided by the districts full time equivalent pupil count (not to be confused with the district's weighted FTE count. Recall that general funds per weighted pupil are equal across districts)
    b. A "weighting ratio" may be calculated by taking a district's weighted FTE count and dividing it by the district's actual FTE count. The weighting ratio represents the ratio of general fund aid per actual pupil to the general fund aid per weighted pupil, or base state aid per pupil. In other words, if a district has 38% more weighted than actual FTE, yielding a weighting ratio of 1.38, that district will receive a general fund per pupil of 38% above base aid, or 1.38 x $3,870 = $5,341 (2001 – 2002).

C. Graphic, Tabular and Statistical Perspective

In this section, I present a few sample visual portrayals of the types of relationships that exist between funding and minority populations across districts within states. The intent of this section is to acquaint the court with common patterns of school

[93] Note that different analysis use different years of minority population data and different sources of that data not for a any particular theoretical or analytical purpose, but because these data and in some cases the analyses themselves were drawn from previous reports and drafts of academic research articles by the author. Such steps were necessary due to the time constraints of producing this report (with notification in mid January, a due date of February 15, and no new data produced in response to plaintiff requests as of February 1, 2003). An upside of the use of various years and sources of data is that despite these differences, the analyses yield very consistent findings.

funding differences. Next, I provide visual and statistical evidence of the disparate effects of the Kansas School District Finance act.

Establishing Measures & Representations of Disparate Impact in School Finance

I have included this brief section as a way to introduce a type of visualization I have found quite useful for understanding and presenting patterns of school funding disparity within states, and differences in those patterns across states. Statistics provided by regression analysis fail to convey the complexity of patterns of disparity in school funding across districts of varied sizes and demographics.[94] In this particular case, I am focusing on patterns of school funding with respect to the minority composition of districts' student populations. To understand the magnitude of effects of any pattern of disparity on a state's children as a whole, it is important to include some indication of the size of school districts, which is done in the "bubble" graphs by representing districts as different size bubbles. It should be of greater concern to policy makers, for example, if a very large circle, or bubble, on the graphs is significantly out of line with its peers.

I apply the following terms to characterize patterns of expenditures per pupil relative to district racial composition:

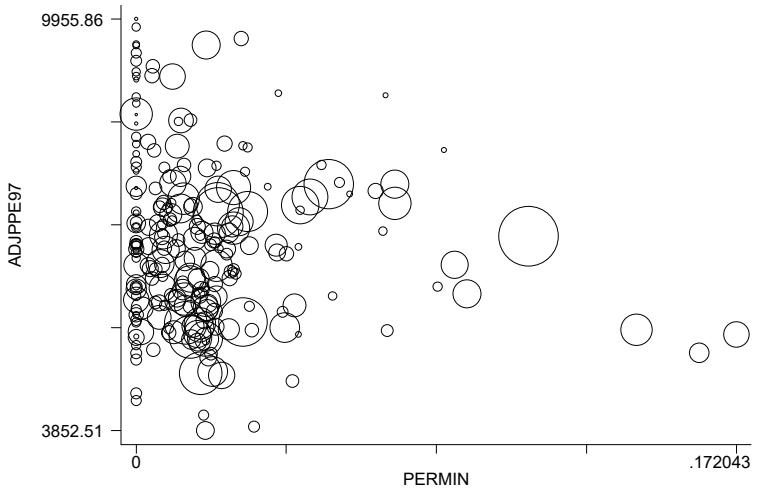
1. Minority-neutral: No systematic[95] relationship between district racial composition and district revenues or expenditures per pupil.
2. Minority-progressive: A systematic relationship whereby districts with higher percentages of minority students have higher revenues or expenditures per pupil (note that a system of this type could also be described as Majority-regressive).
3. Minority-regressive: A systematic relationship whereby districts with higher percentages of minority students have lower revenues or expenditures per pupil (note that a system of this type could also be described as Majority-progressive).

Following are four examples of state school finance systems, characterized in XY "bubble" graphs. In each, the districts' percent minority (percent of all students in a district that are Hispanic, black or Asian, using 1997 estimates) is tracked along the horizontal, or X axis, and the districts' cost adjusted expenditures per pupil are tracked up and down the vertical, or Y axis. Example A involves a relatively small Northeastern state with minority populations ranging from 0 to 17% of district populations and expenditures per pupil ranging from 3850 to 9956 per pupil. Indeed it does appear that a few, mid-size, higher percent minority districts (lower right) have below average expenditures. However, this pattern did not yield statistical significance and might be therefore classified as "neutral."

[94] This is because regression statistics, or at least those most commonly applied, attempt to reduce the relationships in question to a single value, or slope of a linear trendline that indicates the unit change in Y with respect to a unit change in X.

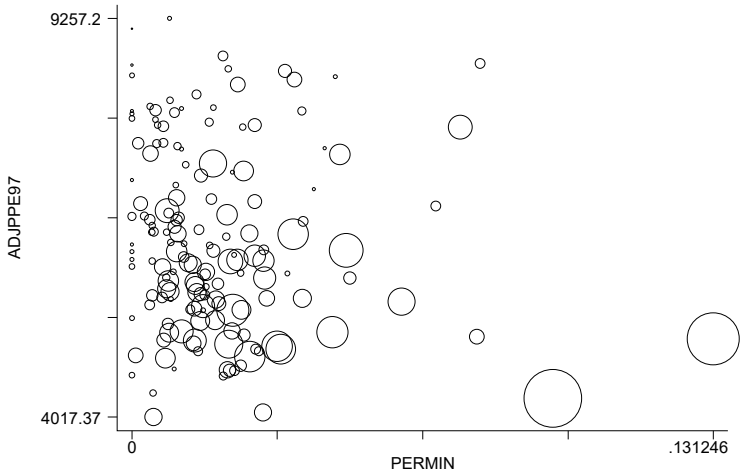
[95] Where the statistical definition of systematic is a relationship that may be represented with a statistically significant linear, log-linear or polynomial (generally 3rd order and below, because ultimately, a polynomial equation can be expanded to "fit" nearly any pattern) equation.

Example A:
Minority-Neutral in Small Northeastern State (Vermont[96])



The neighboring state is presented in Example B and is also a state with relatively few minority students. In Example B, however, the state's two largest districts have higher minority shares than the state's other districts, and appear to have less funding per pupil. Statistical tests of this relationship reveal that the funding system is indeed regressive.

Example B:
Minority-Regressive in Small Northeastern State (New Hampshire[97])



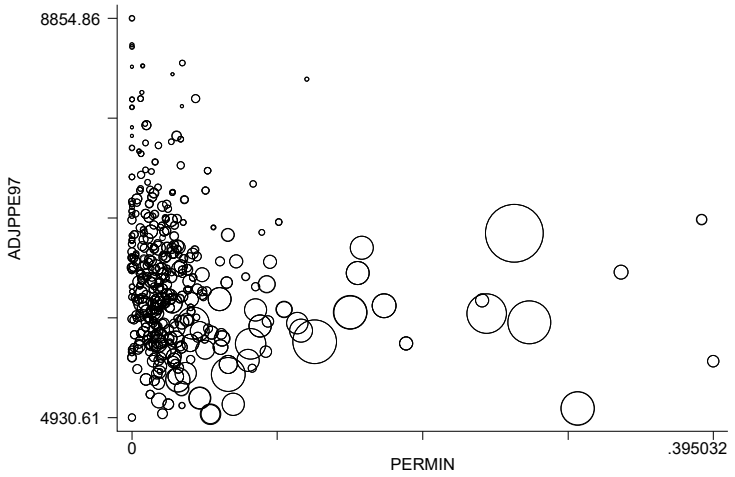
While each of the first two states include many small, rural districts and a few larger (though not large) districts, the complexity of patterns increases quite dramatically when observing larger, more geographically and demographically diverse states.

[96] Funding formula overturned in state court (Brigham v. State, 692 A.2d 384 (1997)).

[97] Funding formula overturned in state court (*Claremont Sch. Dist. V. Governor*, 703 A.2d 1353 (N.H. 1997)).

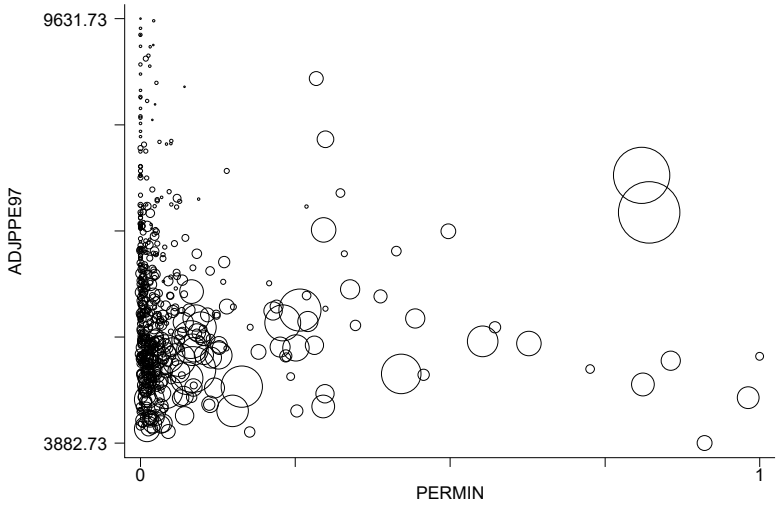
Example C displays a minority-neutral pattern in a state with minority populations ranging up to 39%, and many small, sparse districts, with few minorities, that lack economies of scale, thereby operating at relatively high expenditure per pupil levels. Note in example C that many of the larger, higher percent minority districts have at least average funding per pupil. As a result, the system is statistically neutral. This is not to suggest, however that the system is entirely without equity concerns. One might raise questions as to whether the outlying low-funded midsized district with relatively high minority concentration is being shortchanged.

Example C:
Minority-Neutral in Midwestern State with Rural Scale & Urban Issues (Iowa)



Finally, example D presents a minority-progressive scenario, whereby, for the most part, larger districts serving higher shares of minority students generally have more funding per pupil.

Example D:
Minority-Progressive in Midwestern State with Rural Scale & Urban Issues (Missouri)



Graphic and Statistical Evaluation of SDF

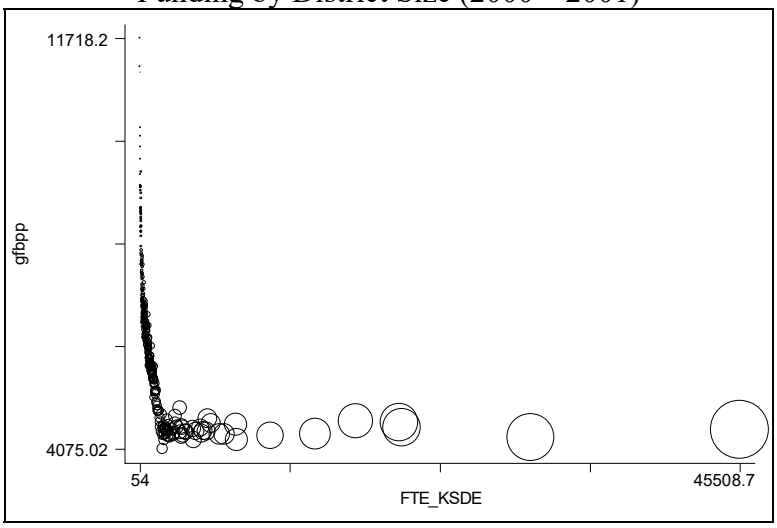
The following bubble graphs of Kansas school districts present a walk-through of the following points:

1. Under SDF, larger districts receive significantly less general fund revenue per pupil
2. The percent of students that are black, Asian and/or Hispanic in larger districts is higher than in smaller districts
3. As a result, districts serving higher percentages of black, Asian and/or Hispanic students systematically receive less funding per pupil.

Data are presented in this sequence to make clear that when SDF was conceived in 1991, it should have been readily understood that providing substantially greater support to small rural districts – support to accommodate district cost issues – and relatively negligible support to accommodate student needs (at risk, limited English proficiency), would create racially disparate effects.

Figure 25 displays that general fund budgets per pupil (gfbpp) are lower for larger districts (enrollment = FTE_KSDE). Larger districts in the figure are presented as larger circles, which in Figure 25 is redundant with the placement of district enrollment on the horizontal axis. That is, from right to left on the horizontal axis, circles will, by definition, be larger.

Figure 25
Funding by District Size (2000 – 2001)

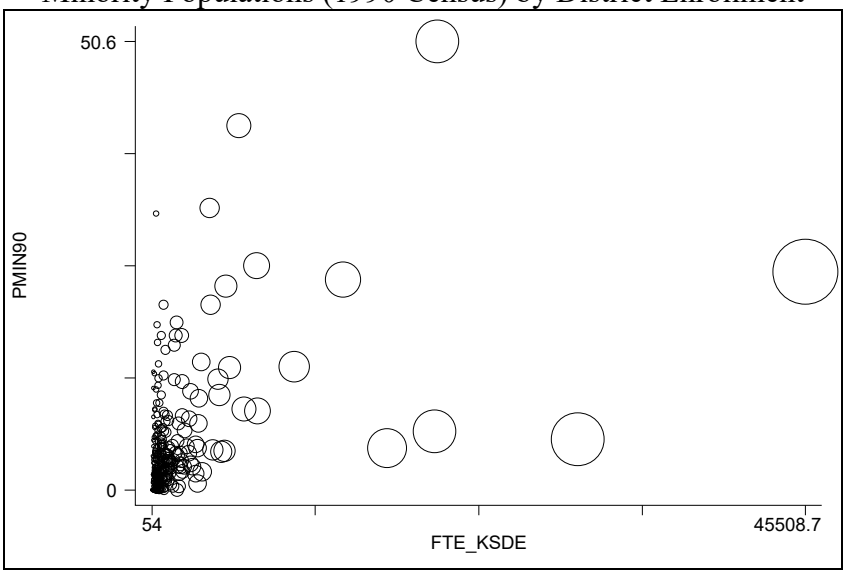


gfbpp = General Fund Budget per Pupil
FTE_KSDE = FTE Pupils

Figure 26 displays the relationship between district enrollment and percent minority, as existed in 1990 according to district-aligned data from the 1990 U.S. Census, indicating that larger districts had larger shares of minority students in 1990. Assuming

some general knowledge of this fact among policymakers **it should have been well-understood that the policy would yield disparate funding by race.**

Figure 26
Minority Populations (1990 Census) by District Enrollment



PMIN90 = Percent Minority, 1990 Census
FTE_KSDE = FTE Pupils

Table 40 presents the minority population shares of school districts falling into three enrollment categories. Recall that districts with greater than 1,725 pupils receive only the minimum correlation aid. Note that approximately 90% (89,948/99,755) of minority students attend these districts, while only 69% of all students and 63% of non-minority students attend these districts.

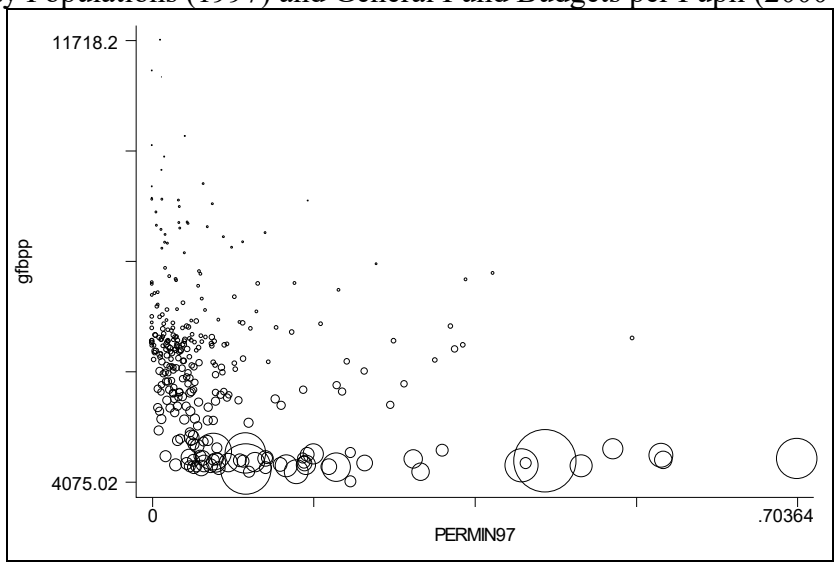
Table 40

Minority Populations (2000-2001) by Enrollment Categories

Enrollment Group	Number of Districts	Number of Students	Mean Percent Minority (2000 – 2001)	Total Minority Students
<300	65	12,901	7.2	929
300 – 1725	185	133,038	6.8	9,047
>1725	54	322,395	27.9	89,948
State Mean	304	468,334	21.3	99,755

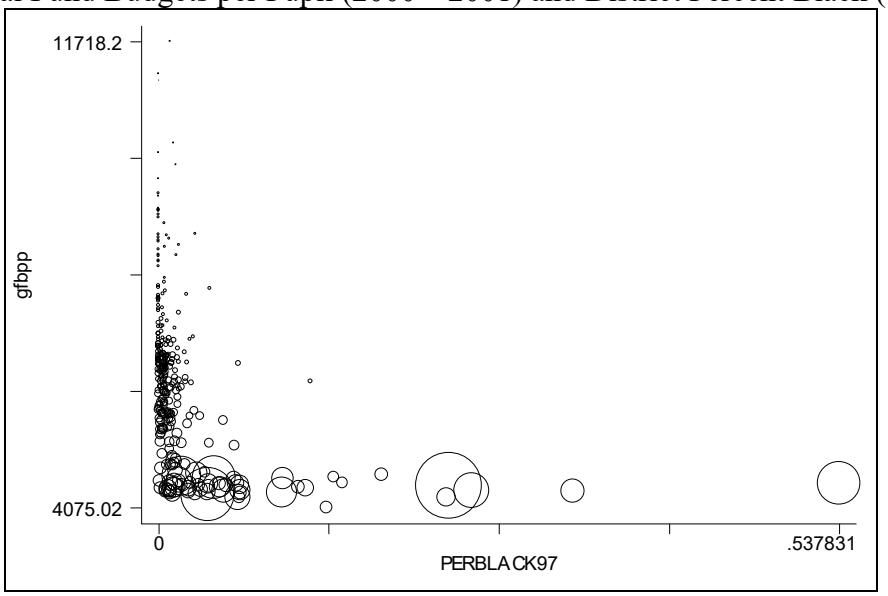
Figure 27 relates 1997 percent minority students with 2000 – 2001 general fund budgets per pupil and figure 28 relates 1997 percent black students with 2000 – 2001 general fund budgets per pupil.

Figure 27
Minority Populations (1997) and General Fund Budgets per Pupil (2000 – 2001)



gfbpp = general fund budget per pupil
PERMIN97 = Percent Minority 1997

Figure 28
General Fund Budgets per Pupil (2000 – 2001) and District Percent Black (1997)



gfbpp = general fund budget per pupil
PERBLACK97 = Percent Black 1997

The statistical significance and magnitude of the relationships portrayed in Figures 27 and 28 are displayed in Table 41. Statistical significance is tested with two functional forms (e.g. the curvature of the line to fit through the bubbles). It is apparent in Figures 27 and 28 that the relationship between minority populations and funding is curved (sweeping downward from left to right, then leveling off). As such, fitting a straight line to the bubble-plot does not necessarily produce a "best fit." It is often easier,

however, to draw inferences from straight lines. Note in Table 41 that when using straight lines, a district's minority share explains 14-16% of the variance in general fund budgets per pupil. Using a curved line (log-log functional form), a district's minority share explains 32-35% of the variance in general fund budgets per pupil. That is, about 1/3 of the differences in general fund budgets per pupil can be explained by district racial composition alone.

The coefficient from the log-log models ranges from -.07 to -.08. The negative sign on the coefficient means that districts with higher minority shares have lower general fund budgets per pupil. The value of .07 indicates that 10% difference in district minority share is associated with a .7% difference in general fund revenues per pupil. For example, an increase from 10% minority to 11% minority (a 10% increase in percent minority), is associated with a .7% decrease in funding (for example, if the district that had 10% minority students had $4,000 in general fund revenues per pupil, the district with 11% minority would have only $3,972 per pupil [4000 – (.007*4000)]. Because percent changes in percentages can be difficult to interpret, the linear alternative is provided. Using the linear option, a district with a 1% higher share of minorities, on average, has about $17 less in general fund revenue per pupil. A district with 1% higher black population share has, on average, approximately $23 less in general fund revenue per pupil.

Table 41
Summary of General Fund Allocations by Race 1996 – 2000

	Percent Minority (1997)		**Percent Black (1997)**	
Year	Coefficient*	Adj. R-square	Coefficient	Adj. R-square
Linear Functional Form				
1996	-1783	.16	-2362	.13
1997	-1757	.16	-2357	.13
1998	-1652	.14	-2216	.11
1999	-1662	.14	-2261	.11
2000	-1737	.14	-2351	.12
Log-Log Functional Form				
1996	-.08	.35	-.06	.39
1997	-.08	.34	-.06	.38
1998	-.07	.32	-.05	.35
1999	-.07	.31	-.05	.36
2000	-.08	.32	-.05	.35

*All coefficients significant (with linear fit) at p<.001

Table 42 presents an alternative, tabular perspective using district reported race data (KSDE) and 2000 – 2001 general fund budgets calculated by weighting ratios. Two things are readily apparent in Table 42. First, the average ratio of weighted to actual FTE and related general fund budgets per pupil are lower for minority students than for white students. Second, there is particularly little variation, as evident in the small standard deviation, in general fund revenues available to black students.

Table 42
Average general fund aid (by weighting ratio calculation) by race (2000 – 2001)

	N[(A)]	MEAN WEIGHTING RATIO	STD. DEV.	GENERAL FUND PER PUPIL	% BELOW WHITE
White	368,830	1.285	0.217	$ 4,909	
Indian	6,112	1.244	0.182	$ 4,752	3.2%
Hispanic	41,499	1.215	0.158	$ 4,641	5.4%
Asian	10,278	1.172	0.093	$ 4,477	8.8%
Black	41,615	1.163	0.073	$ 4,443	9.5%

Note: Mean weighting ratios by race created by using district minority populations as weights. So as not to deflate standard deviations on false assumptions that all students in a given district have access to the exact same amount of revenue per pupil, analytic weights were used in place of frequency weights in STATA v7.0. Analytic weights assume that a value applied to multiple cases represents a mean value for those cases. As such, standard deviations in this table are conservative.

Table 43 presents yet another perspective, classifying school districts by their level of general fund aid into quartile groups. Then, using district reported minority population data from 2000-2001, the average characteristics for districts in each funding quartile were calculated. While districts in the highest funded quartile, with general fund revenues per pupil above $6,496 were 92.4% white, districts in the lowest funded quartile, with less than $5,226 per pupil, were only 74% white.

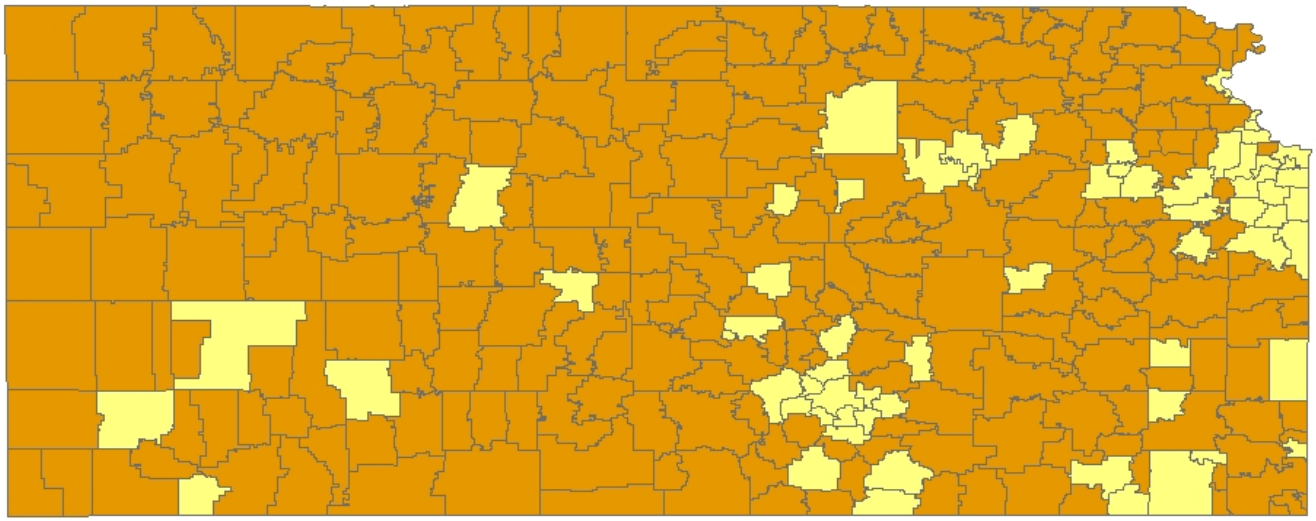
Table 43
Average racial composition (2000 – 2001) of districts by funding level (2000 – 2001)

	4TH QUARTILE		3RD QUARTILE		2ND QUARTILE		1ST QUARTILE	
Ratio Range	> 1.701		1.589-1.701		1.368-1.589		<1.368	
GFB Range	> $6,496		$6,070-$6,496		$5,226-$6,070		<$5,226	
White	207.39	92.4%	424.89	93.4%	778.46	93.2%	3,442.28	74.1%
Black	1.33	0.6%	3.89	0.9%	8.95	1.1%	533.39	11.5%
Hispanic	13.04	5.8%	22.16	4.9%	30.74	3.7%	480.11	10.3%
Indian	2.08	0.9%	2.68	0.6%	14.08	1.7%	61.58	1.3%
Asian	0.63	0.3%	1.51	0.3%	3.14	0.4%	129.95	2.8%
Total	224.47		455.13		835.37		4647.32	

D. Geographic View of Racial Disparities

Figures 29 through 32 present a geographic view of general fund budget differences and the distribution of Kansas students by race.

Figure 29
General Fund Budgets 2000 – 2001 Greater and Less than $5000



As dictated by SDF, the lowest general funds per pupil are found in the state's mid-size and larger districts, including Wichita, Topeka , and KCK as well as Salina, Dodge City, Garden City and Emporia.

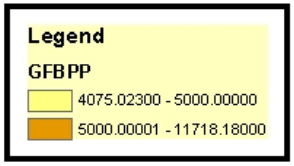
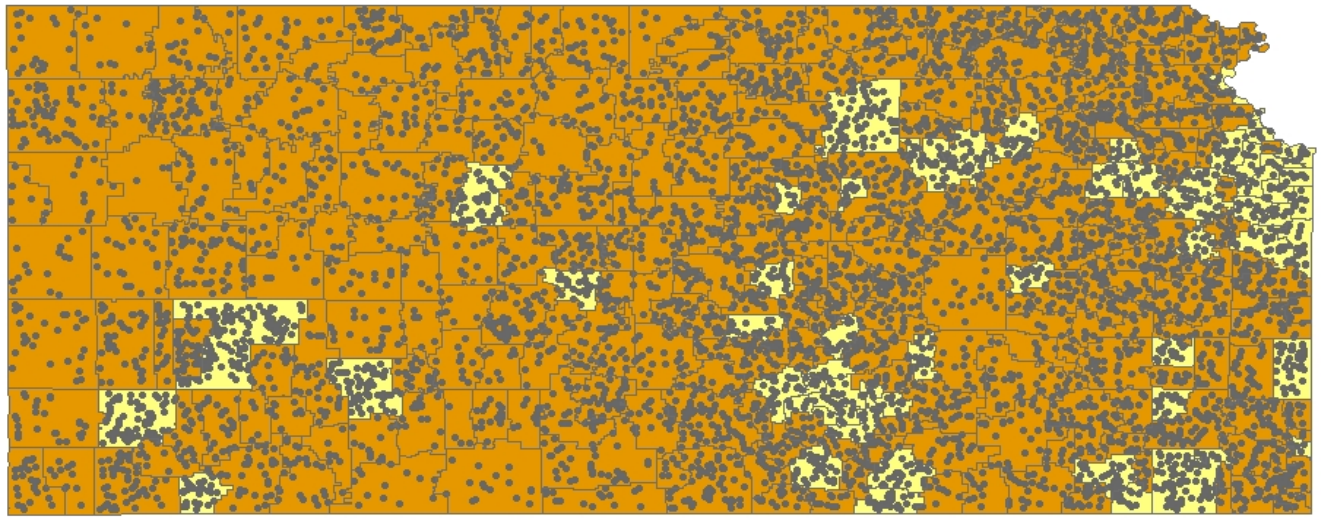
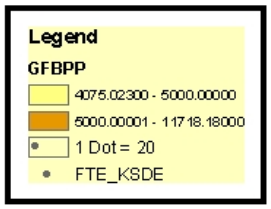


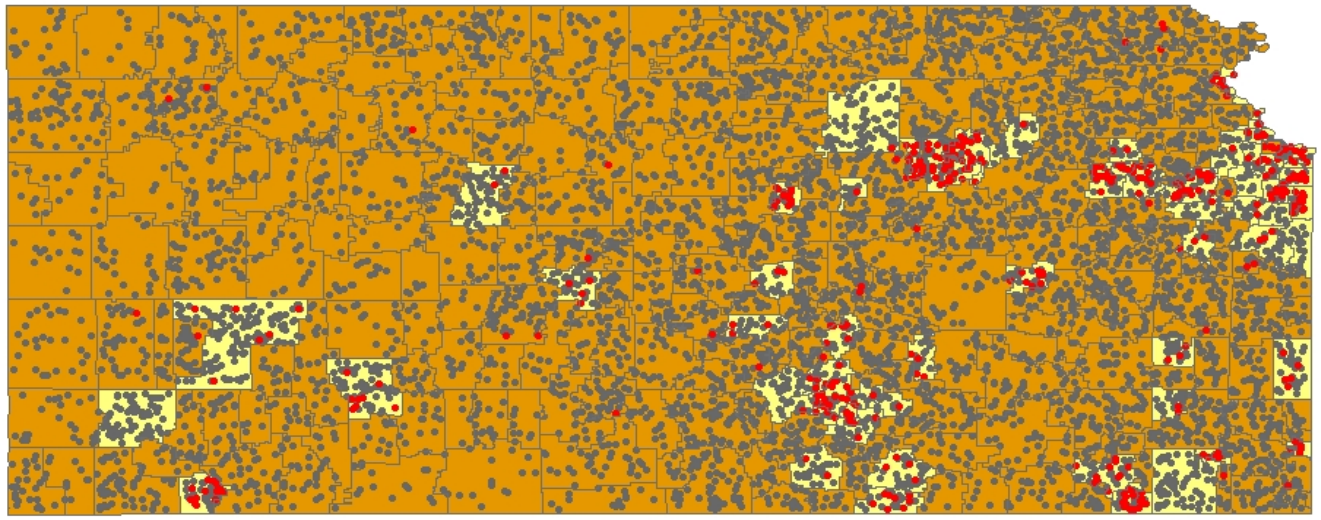
Figure 30
Distribution of Students (2000 – 2001) Across Kansas

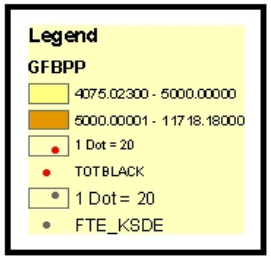




While clearly concentrated in the state's larger districts and metropolitan areas, the student population as a whole does spread out into the rural areas of the state where districts receive more funding per pupil.

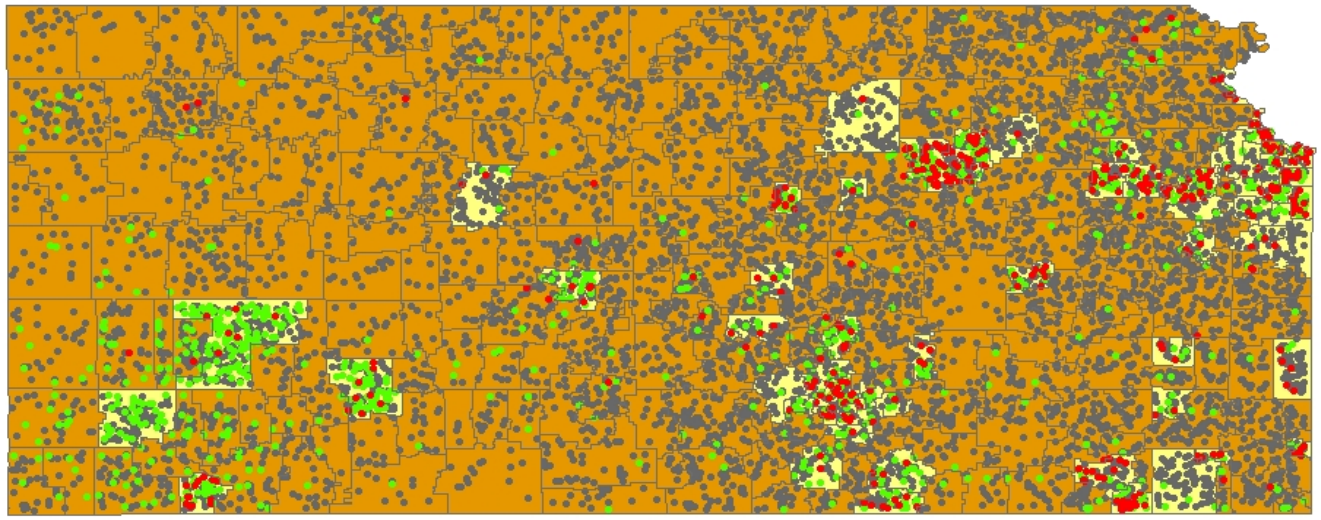
Figure 31
Distribution of Black Students (1997) & All Students Across Kansas

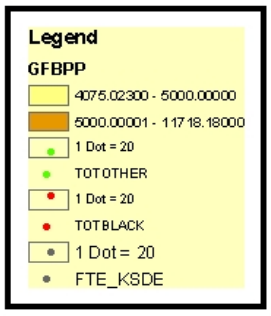




The populations of black students in the state are highly concentrated in four areas, including Wichita, Topeka/Lawrence, Junction City, and the Kansas City metropolitan area. Very few black students in the state attend districts with general fund budgets over $5,000 (2000 – 2001)

Figure 32
Distribution of All Minority Students (1997) and All Students Across Kansas





In addition to the state's metropolitan areas, other minority students are highly concentrated in Dodge City, Garden City and Emporia.

E. The Racial Achievement Gap Above and Beyond Poverty and Language Proficiency

Table 44 reports estimates of the achievement gap between black and white children, and between Hispanic and white children in 1997, 1999 and 2001, on elementary, middle and high school level reading and math assessments. Gaps were estimated via multiple regression analysis, controlling for poverty status and language proficiency status and excluding children with disabilities. That is, the table estimates the average of the difference in test scores between low income blacks and low income whites, non-low income blacks and non-low income whites etc.

Table 44 indicates persistent gaps in achievement between black students and white students, and between Hispanic students and white students, **even when controlling for income status** (via qualification for free or reduced price lunch). This finding is consistent with other literature that shows performance differences by race and ethnicity even when controlling for more comprehensive indices of student socio-economic background characteristics.[98] In some cases, those gaps became smaller from 1997 to 2001, but in others they remained constant, or grew larger. Most notably, the reading performance of Black students appears to have improved. However, it is important to note that any apparent changes over time may be a function of differences in the make-up of the test taking cohorts, or differences in the tests themselves, because each year of data was independently analyzed to produce the findings in Table 44.

[98] See, for example, Bruce D. Baker, Christine Keller-Wolff, Lisa Wolf-Wendel (2000) Two Steps Forward, One Step Back: Race/Ethnicity and Student Achievement in Education Policy Research. *Educational Policy* 14 (4) 511-529.

Table 44
Black and Hispanic children's test scores relative to White children's scores, controlling for language proficiency, poverty (free or reduced lunch), excluding students with disabilities

		Elementary	Middle	Secondary
Math				
Hispanic	1997	-5.99 (-.36)	-9.04 (-.55)	-7.16 (-.46)
	1999	-5.47 (-.33)	-7.46 (-.45)	-6.98 (-.42)
	2001	-4.60 (-.28)	-10.02 (-.61)	-8.53 (-.52)
Black	1997	-11.58 (-.70)	-12.41 (-.75)	-10.82 (-.69)
	1999	-9.75 (-.59)	-11.87 (-.72)	-10.85 (-.66)
	2001	-11.98 (-.73)	-13.63 (-.83)	-11.91 (-.72)
Reading				
Hispanic	1997	-5.54 (-.34)	-8.31 (-.51)	-5.41 (-.33)
	1999	-5.00 (-.30)	-8.47 (-.27)	-6.21 (-.38)
	2001	-3.78 (-.23)	-5.68 (-.35)	-5.95 (-.36)
Black	1997	-9.73 (-.59)	-10.90 (-.66)	-9.24 (-.56)
	1999	-10.16 (-.62)	-9.42 (-.57)	-8.74 (-.53)
	2001	-7.26 (-.44)	-7.04 (-.43)	-8.43 (-.51)

Points below white students outside of parentheses
Standard deviations below white students inside parentheses

F. Recently released NAEP reading results

Recently released data from the National Assessment of Educational Progress (NAEP) on race gaps in reading performance for 4th and 8th grade students show Kansas black students falling behind at higher grade levels. For example, Black students in the 4th grade in Kansas scored 20 points below white students. This gap ranked Kansas 29th of 35 states reporting, giving Kansas a gap for 4th grade black students 9 points better than the national average.

Black 8th graders in Kansas however, faired much more poorly relative to their White Kansas counterparts. Their gap with respect to white students was 29 points, ranking Kansas tied for 6th place, behind only Connecticut, Pennsylvania, Massachusetts, Alabama and Texas in the size of the black white test score gap and giving Kansas a larger gap than the national average (See Appendix C).

IX. CHILDREN WITH DISABILITIES

A. Overview of Service Delivery Options and Funding for Special Education in Kansas

To make sense of special education finance policy and its effects on Kansas school districts and Kansas children first requires understanding how special education services are delivered to children with disabilities in Kansas. Table 45 provides a synopsis. Students with more severe disabilities, or those students who require more specialized services and for whom it is less educationally appropriate to be served in a regular classroom setting, are served in either of two basic settings. Students with severe disabilities from small and medium sized districts are served together in cooperative service centers. Only the state's largest districts are large enough to provide within district services. Because students with more severe disabilities from small and medium sized districts are served in similar settings, of similar scale, costs associated with meeting their needs should be similar (with the possible exception of transportation costs). As such, total general education and special education revenues should not vary by the scale of the *sending district* (district of residence of the child with a disability attending a cooperative center), for students attending cooperative service agencies.

Children with less severe disabilities may be included in regular classroom settings within their district of residence. It is important at this point to refer back to the previous discussion of economies of scale, in which it was noted that smaller districts tend to have more teachers available per student, and that while having more teachers per student may be necessary and appropriate for small, remote districts, there will be unintended and perhaps unavoidable advantages available to children in small districts relative to children in larger districts. That is, the smaller class sizes produce a more conducive learning environment for all children, and in particular for providing support to children with widely varied needs. Further, the additional support (in the form of staffing) required for a student with a disability included in a regular classroom of 12 students is likely to be significantly less than the additional support required for a student with a similar disability in a regular classroom of 20 to 25 students.

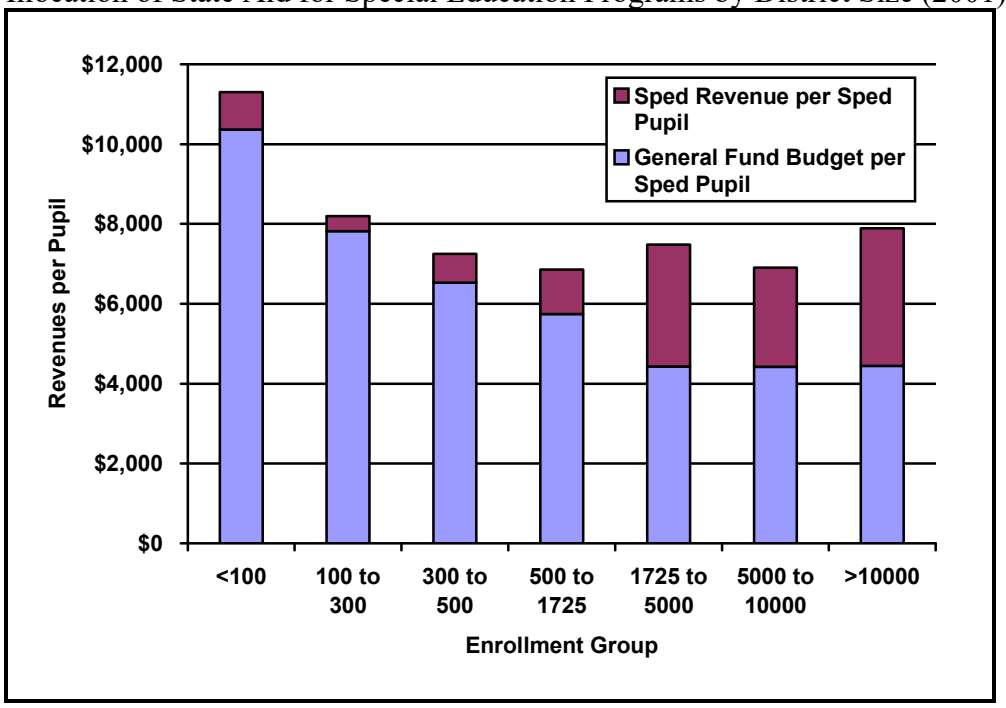
Table 45
Service Delivery Options for Students with Disabilities in Kansas

District Size	Services for Students with Severe Disabilities	Services for Students with Less Severe Disabilities
Small (<1800)	In cooperative services center	In regular classroom
Medium (1800 to 5000)	In cooperative services center	In regular classroom
Large (>5000)	In district special facilities	In regular classroom

Figure 33 displays the allocation of state aid for special education across districts by size in 2002. By allocating significantly less special education aid per special education pupil to smaller districts and significantly more to larger districts, the state has made some effort to balance districts' ability to pay for services that are expected to be of relatively similar cost by district size. However, figure 33 would suggest that that effort is

far from enough, leaving larger districts with significantly lower total resources per special education child than their smaller counterparts. This in spite of the fact that the costs of serving students with more severe disabilities in small and medium sized districts, in the same settings, should be the same.

Figure 33
Allocation of State Aid for Special Education Programs by District Size (2001)



Source: General Fund Legal Max FY 2002. KSDE.
(districts reporting "0" revenues excluded in calculation of group averages)

Figure 34 displays the special education expenditures per special education pupil and cash balances per special education pupil by district size. Figure 34 would appear to at least anecdotally confirm that costs per special education pupil may be higher in larger districts (setting aside questions of efficiency that limit our ability to infer costs from expenditure data, and noting the expected minimal influence of local voters on special education expenditures under the present, state controlled school funding formula) and that pattern of combined general and special education revenues per special education pupil presented in Figure 34 may be allowing smaller districts far more substantial flexibility, including the option to retain much larger cash balances than larger districts. Table 45 provides the data underlying these charts.

Figure 34
Special Education Expenditures and Cash Balances per Special Education Pupil by District Size (2001)

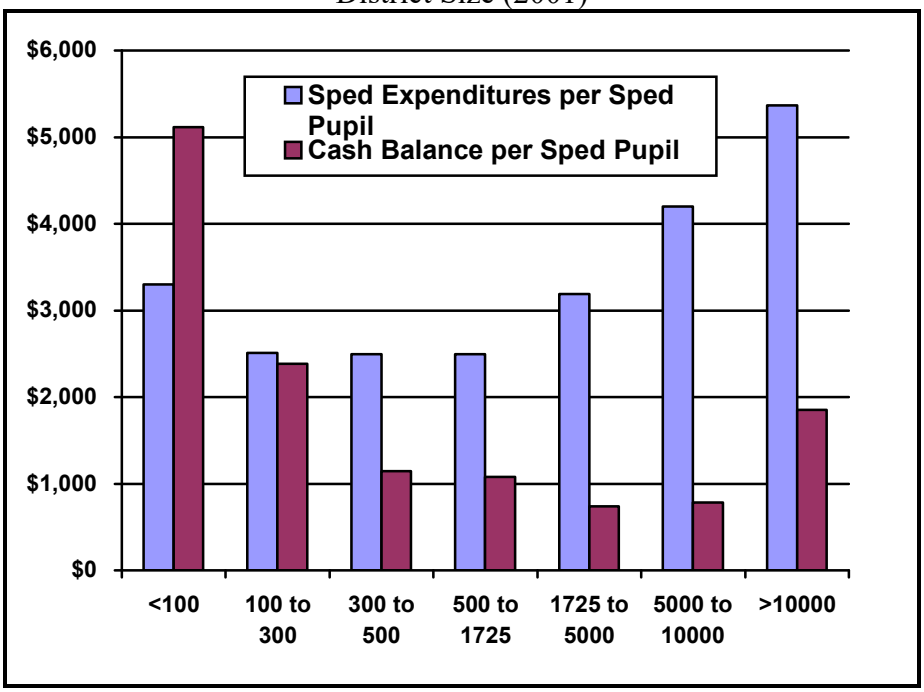
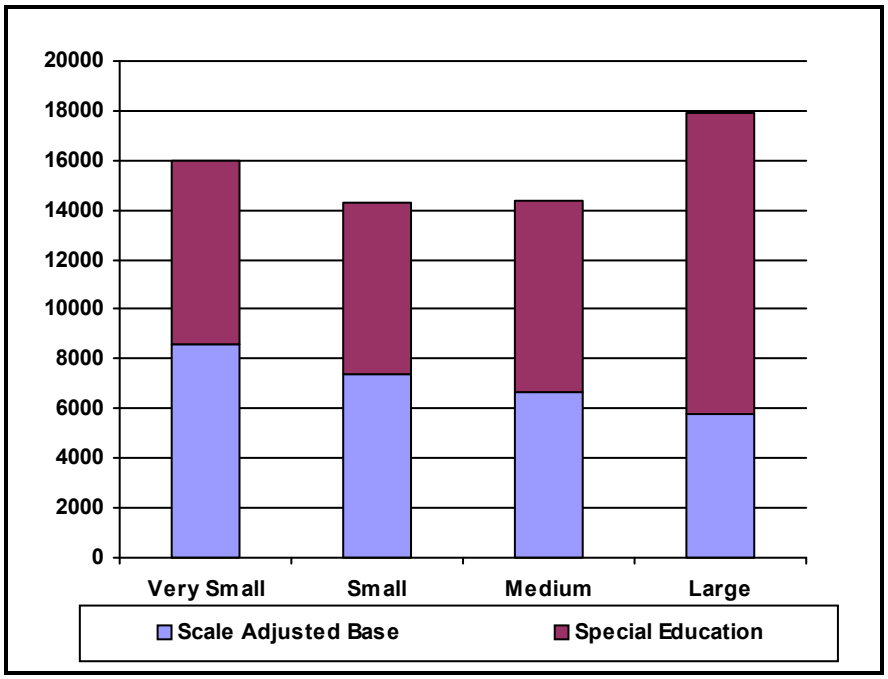


Figure 33 would suggest that the Kansas legislature assumes that total costs of serving children with disabilities are lower in larger districts and higher in smaller ones, otherwise there would be no reason to allocate aid such that smaller districts have more resources per pupil. This assumption applied to the allocation of FY2001 aid, despite evidence to the contrary produced for the legislature in a 1998 report from the division of Post Audit that indicated that districts with higher special education costs per special education pupil tended to be larger districts (99PA02, p. 12).

More recently, the cost study by Augenblick and Myers has also indicated higher special education costs per pupil in larger school districts. Figure 35 provides Augenblick and Myers estimates of the costs of meeting the needs of students with disabilities across Kansas districts of varied size. Augenblick and Myers also find the average costs per pupil of serving children with disabilities to be slightly higher in larger, not smaller districts.

Each of these graphs along with the more detailed data in Table 46 suggest significant inconsistencies between the allocation of special education aid to Kansas districts by size, and the costs of meeting the needs of children with disabilities in districts of different sizes.

Figure 35
Cost of Providing "Input Standard of Suitability" for Special Education Students by District Size



Source: Augenblick & Myers Cost Study Table IV-10

Table 46

Summary Data on Special Education Revenues, Expenditures and Cash Balances & District Characteristics by District Enrollment Category

Variable	<100	100 to 300	300 to 500	500 to 1725	1725 to 5000	5000 to 10000	>10000
Revenues and Expenditures per Pupil							
General Fund Budget per Pupil[99]	$10,369	$ 7,821	$ 6,531	$ 5,740	$ 4,428	$ 4,418	$ 4,447
Sped Transfers from GFB/LOB per Pupil[100]	$ 703	$ 361	$ 311	$ 311	$ 277	$ 283	$ 442
Sped Revenue per Pupil [101]	$ 153	$ 60	$ 132	$ 197	$ 525	$ 460	$ 583
Sped Expenditures per Pupil [102]	$ 598	$ 384	$ 416	$ 401	$ 498	$ 749	$ 912
Cash Balance per Pupil [103]	$ 1,069	$ 358	$ 189	$ 170	$ 113	$ 138	$ 296
Revenues and Expenditures per Sped Pupil							
General Fund Budget per Sped Pupil	$10,369	$ 7,821	$ 6,531	$ 5,740	$ 4,428	$ 4,418	$ 4,447
Sped Revenue per Sped Pupil	$ 932	$ 375	$ 717	$ 1,116	$ 3,056	$ 2,489	$ 3,446
Sped Expenditures per Sped Pupil	$ 3,302	$ 2,509	$ 2,492	$ 2,497	$ 3,191	$ 4,201	$ 5,363
Cash Balance per Sped Pupil	$ 5,112	$ 2,384	$ 1,144	$ 1,078	$ 740	$ 784	$ 1,854
Sped Transfers from GFB/LOB per Sped Pupil	$ 3,401	$ 2,369	$ 1,851	$ 1,969	$ 1,776	$ 1,638	$ 2,593
Financial Summary Statistics							
General & Sped Revenues per Sped Pupil	$10,901	$ 8,133	$ 7,152	$ 6,788	$ 7,404	$ 6,907	$ 7,893
General Fund Revenues less Sped Transfers	$ 9,666	$ 7,460	$ 6,220	$ 5,429	$ 4,151	$ 4,135	$ 4,005
District Mean Population Characteristics[104]							
Percent Limited English Proficient	0.0%	2.0%	1.6%	1.1%	1.1%	8.3%	3.7%
Percent Minority	0.9%	6.2%	4.8%	6.4%	11.8%	28.5%	30.1%
Percent Poverty	20.7%	17.6%	16.3%	13.8%	12.1%	14.2%	13.0%
Pupils to Regular Classroom Teachers[105]	11.30	11.30	13.40	15.60	18.00	18.80	18.00
Expected Regular Classroom Composition							
Children from Poverty	2	2	2	2	2	3	2
LEP Children	0	0	0	0	0	2	1
Other Children	9	9	11	13	16	15	15

[99] 2000-2001 General Fund Budget per FTE Pupil (KSDE)

[100] Based on 2000 - 2001 Percent Line Item report, applying percent line item for Special Educaton Transfers to 2000 – 2001 General Fund and Supplemental Fund Budgets per Pupil (KSDE)

[101] From FY02 General Fund Legal Max file, report of special education aid 2002 (KSDE)

[102] From unencumbered Cash Balances file 2001 – Special Education, Capital Outlay and Food Service Funds (KSDE)

[103] as in footnote 27.

[104] Based on U.S. Census Data

[105] Based on total classroom teacher counts from 2001-2002 CertPerson (KSDE) file, counts of certified classroom teachers divided by enrolled pupils.

B. Statistical Analysis of Special Education Revenue and Expenditure Patterns

This section includes a few statistical tests to further validate special education revenue and expenditure patterns across Kansas districts. Table 47 presents statistical tests of whether and how special education expenditures per special education pupil and cash balances per special education pupil vary with available general instructional funds, recognizing the general instructional funds vary primarily by district size. Special education expenditures per special education pupil tend to be lower in districts with larger general fund and local option budgets per pupil (even when accounting for differences in cash balances in the regression). Further, special education cash balances per pupil tend to be higher in districts with higher general fund and LOB revenues per pupil.

Table 47
Regression Analysis of Special Education Resources and General Fund Budgets per Pupil

	DV = General Fund Budget & LOB per Pupil		**DV = General Fund Budget & LOB per Pupil**	
	Estimate	Sig.	Estimate	Sig.
Constant	5526.035	***	5994.185	***
Cash Balance per Pupil	1.130	***	2.325	***
Special Education Expenditures per Special Education Pupil			-.178	***
Adj. R-squared	.039		.229	

Weighted for district size
***p<.01

Table 48 includes tests of whether districts of different size are affected differently by the need to transfer general funds to special education. Table 46 provides per pupil amounts of transfers based on Fy2000 transfer rates. Table 48 however provides a statistical estimate of the differences in percentages of general funds transferred by district size. Larger school districts transfer larger percentages of their general education funds to cover costs of special education programs. Despite the apparent trend in the opposite direction in Table 46 (unweighted averages for each group), when regression analysis is weighted for district size, larger school districts transfer higher dollar amounts per pupil of general education funds to special education.

Table 48
Regression Estimates of the Relationship Between District Size and General Fund Transfers to Special Education

	DV = Percent of General & LOB Fund Transferred to Special Education		DV = Per Pupil Amount of General Fund Transferred to Special Education	
Variable	Estimate	Sig.	Estimate	Sig.
Constant	4.951	***	295.408	***
FTE Enrollment	.0001	***	.004	***
Adj. R-squared	.455		.295	

Weighted for district size
***p<.01

Finally, Table 49 tests whether differences in rates of general fund transfers to special education are associated with differences in regular classroom pupil to teacher ratios. Regressions in Table 49 indicate that districts with higher general education budgets after transfers to special education tend to have lower pupil to teacher ratios, supporting the contention that districts benefiting from low enrollment weight are able to provide smaller classes for serving students with disabilities included in the regular classroom.

Decomposing the first analysis, districts with larger general education budgets per pupil before transfers also tend to offer lower pupil to teacher ratios. In addition, districts that must transfer higher amounts of general funding per pupil to special education tend to have higher pupil to teacher ratios. The reason this decomposition is important is that it indicates that each component – general education revenue differences and special education transfers – has its own statistically significant effect on certified classroom teacher contact with students in regular education settings. That is, the differences in special education funding transfer rates that are caused by the illogical allocation scheme influence the quality of regular classroom services.

Table 49
Regression Estimates of the Relationship between General Funds and Special Education Transfers to Regular Education Class Sizes

	DV = Regular Ed. Pupil to Teacher Ratio		DV = Regular Ed. Pupil to Teacher Ratio	
	Estimate	Sig.	Estimate	Sig.
Constant	29.436	***	29.092	***
General Fund & LOB less Special Education Transfer per pupil	-.002	***		
General Fund & LOB per pupil			-.002	***
Special Education Transfer per pupil[(1)]			.003	***
Adj. R-squared	.664		.664	

General education funds transferred to special education accounts, per total district FTE
Weighted for district size
***p<.01

C. Summary of Special Education Funding in Kansas

Problems associated special education funding in Kansas are primarily a function of problems with general education funding in Kansas. In fact, it appears to some extent that the legislature has attempted to compensate for general fund allocation problems by allocating much higher rates of excess cost subsidy to larger districts in recent years. Yet even the present degree of compensation has been insufficient to offset the vast and illogical patterns of disparity created by general fund cost adjustments. It is conceivable that a personnel based, excess cost formula could function appropriately in Kansas, if general fund allocations were first made suitable via either an input or outcome based standard.

Appendix D includes a policy brief prepared by Bruce Baker along with Jane Helen Wortman and Tom Skrtic of the Department of Special Education at the University of Kansas addressing policy options for special education finance.

Appendix A
Relative Growth Rates of Revenues and Expenditures Across the States

	Current Instructional Expenditures per Pupil		Current Expenditures per Pupil		Current Expenditures per Pupil Less Special Education Revenues (State)		Total Revenue (Federal, State, Local) per Pupil		State and Local Revenue per Pupil	
STATE	*Growth per Year (Relative to KS)*	*Sig.*	*Growth per Year (Relative to KS)*	*Sig.*	*Growth per Year (Relative to KS)*	*Sig.*	*Growth per Year (Relative to KS)*	*Sig.*	*Growth per Year (Relative to KS)*	*Sig.*
Alabama	84.07	0.00	94.44	0.00	133.66	0.00	66.43	0.00	72.70	0.00
Alaska	71.09	0.00	-40.38	0.05	-19.23	0.34	-198.82	0.00	-235.35	0.00
Arizona	0.36	0.96	-31.19	0.02	-11.02	0.40	-48.85	0.00	-51.75	0.00
Arkansas	38.26	0.00	36.33	0.01	53.00	0.00	-3.18	0.85	3.66	0.83
California	59.59	0.00	23.36	0.02	38.93	0.00	46.13	0.00	52.27	0.00
Colorado	12.79	0.08	10.80	0.38	29.47	0.02	-68.54	0.00	-54.65	0.00
Connecticut	64.40	0.00	58.20	0.00	61.53	0.00	42.03	0.01	53.40	0.00
Delaware	93.47	0.00	127.20	0.00	146.57	0.00	144.56	0.00	145.66	0.00
Dist. of Columbia	10.15	0.50	111.56	0.00	131.61	0.00	233.06	0.00	107.67	0.00
Florida	-12.10	0.05	-55.55	0.00	-77.25	0.00	-85.82	0.00	-80.60	0.00
Georgia	92.84	0.00	88.17	0.00	108.21	0.00	104.89	0.00	111.41	0.00
Hawaii	5.72	0.59	-40.42	0.02	-100.58	0.00	-11.31	0.61	-24.52	0.26
Idaho	59.57	0.00	59.80	0.00	98.10	0.00	5.66	0.78	13.67	0.49
Illinois	84.91	0.00	95.19	0.00	113.14	0.00	65.99	0.00	55.02	0.00
Indiana	84.20	0.00	101.21	0.00	119.08	0.00	105.07	0.00	114.85	0.00
Iowa	22.60	0.00	24.95	0.06	45.49	0.00	21.65	0.19	33.92	0.04
Kansas										
Kentucky	72.17	0.00	57.94	0.00	77.98	0.00	-6.50	0.68	-6.07	0.69
Louisiana	45.56	0.00	35.76	0.00	52.44	0.00	-13.36	0.38	-18.40	0.21
Maine	99.70	0.00	110.90	0.00	130.97	0.00	31.22	0.16	42.32	0.05
Maryland	42.59	0.00	33.43	0.01	48.88	0.00	19.70	0.19	23.25	0.11
Massachusetts	223.95	0.00	215.26	0.00	235.24	0.00	155.06	0.00	161.60	0.00
Michigan	76.29	0.00	60.34	0.00	38.29	0.00	31.87	0.02	38.10	0.00
Minnesota	48.95	0.00	43.22	0.00	10.51	0.37	46.88	0.00	56.93	0.00
Mississippi	36.51	0.00	37.22	0.01	57.21	0.00	-39.53	0.02	-35.91	0.03
Missouri	49.50	0.00	40.24	0.00	55.35	0.00	12.01	0.42	19.47	0.18
Montana	93.46	0.01	75.47	0.22	95.69	0.12	76.60	0.33	76.84	0.31
Nebraska	-8.11	0.38	-26.98	0.08	-26.04	0.09	-18.95	0.33	-15.94	0.40
Nevada	-1.79	0.85	-30.58	0.05	-28.64	0.06	-59.10	0.00	-45.96	0.02
New Hampshire	35.37	0.00	0.20	0.99	20.24	0.28	-58.14	0.02	-50.98	0.03
New Jersey	76.11	0.00	116.65	0.00	122.87	0.00	40.16	0.01	62.37	0.00
New Mexico	53.67	0.00	81.71	0.00	101.71	0.00	39.68	0.03	13.12	0.47
New York	155.77	0.00	139.23	0.00	116.73	0.00	90.78	0.00	93.78	0.00
North Carolina	62.08	0.00	43.48	0.00	77.33	0.00	22.80	0.10	34.50	0.01
North Dakota	30.14	0.02	22.01	0.30	39.13	0.06	-10.62	0.69	-11.24	0.67
Ohio	46.27	0.00	48.04	0.00	81.95	0.00	61.58	0.00	67.53	0.00
Oklahoma	22.17	0.00	21.64	0.09	41.21	0.00	-55.56	0.00	-58.03	0.00
Oregon	26.39	0.00	7.91	0.55	31.96	0.01	-35.87	0.03	-27.35	0.09
Pennsylvania	13.56	0.03	-21.14	0.05	-18.39	0.08	-27.96	0.04	-14.23	0.28
Rhode Island	89.86	0.00	128.91	0.00	149.69	0.00	112.21	0.00	110.40	0.00
South Carolina	65.94	0.00	82.98	0.00	85.07	0.00	61.93	0.00	68.10	0.00
South Dakota	28.01	0.02	17.48	0.39	29.92	0.14	6.84	0.79	-2.37	0.93
Tennessee	73.18	0.00	72.05	0.00	92.09	0.00	-8.46	0.57	0.43	0.98
Texas	74.96	0.00	58.25	0.00	119.17	0.00	-30.16	0.02	-31.36	0.01
Utah	30.90	0.00	-15.15	0.25	-4.64	0.72	-41.76	0.01	-38.18	0.02
Vermont	42.79	0.04	29.74	0.39	2.85	0.93	12.39	0.78	12.52	0.77
Virginia	76.41	0.00	67.66	0.00	77.64	0.00	18.87	0.18	33.46	0.02
Washington	3.28	0.64	-30.98	0.01	-6.97	0.54	-63.63	0.00	-62.39	0.00
West Virginia	87.33	0.00	112.87	0.00	132.91	0.00	25.86	0.17	8.74	0.63
Wisconsin	62.30	0.00	74.78	0.00	88.75	0.00	67.95	0.00	74.98	0.00
Wyoming	52.78	0.00	67.90	0.00	89.10	0.00	11.35	0.69	-5.24	0.85

Appendix B

Buildings Meeting
Standards of Excellence
2001-2002
(Number of Students Tested Appears in Parentheses After Grade Level)
Schools with an asterisk (*) tested 5 or fewer students

USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
101	Erie St Paul	0102	ERIE ELEMENTARY			5 (45) 8 (40)
101	Erie St Paul	0108	GALESBURG ELEMENTARY	4 (14) 7 (9)		
101	Erie St Paul	0116	ST. PAUL ELEMENTARY	4 (17)		5 (12)
101	Erie St Paul	0120	THAYER ELEMENTARY	7 (18)	8 (17)	8 (17)
102	Cimarron-Ensign	0124	CIMARRON ELEMENTARY			5 (50)
102	Cimarron-Ensign	0125	CIMARRON HIGH			11 (43)
104	White Rock	2322	WHITE ROCK HIGH		11 (9)	
104	White Rock	2306	WHITE ROCK MIDDLE	7 (7)	8 (9)	
203	Piper	0180	PIPER ELEM EAST			5 (91)
204	Bonner Springs	0214	BONNER SPRINGS HIGH			11 (167)
205	Leon	0238	LEON ELEMENTARY		5 (48)	
207	Ft Leavenworth	0286	BRADLEY ELEMENTARY	4 (75)		5 (69)
207	Ft Leavenworth	0288	EISENHOWER ELEMENTARY			5 (73)
207	Ft Leavenworth	0290	MACARTHUR ELEMENTARY	4 (80)		5 (58)
208	Wakeeney	0306	WAKEENEY ELEMENTARY			8 (42)
209	Moscow	0342	MOSCOW ELEMENTARY	4 (11)		
212	Northern Valley	0408	LONG ISLAND ELEMENTARY	7 (14)		
216	Deerfield	0482	DEERFIELD ELEMENTARY	4 (20)		
220	Ashland	0554	ASHLAND HIGH		11 (19)	
221	North Central	0582	NORTH CENTRAL HIGH		8 (7) 11 (12)	
221	North Central	0576	NORTH CENTRAL UPPER ELEM	4 (6)		
222	Washington	0594	WASHINGTON ELEMENTARY	4 (19)		
222	Washington	0596	WASHINGTON HIGH		11 (25)	
223	Barnes	0620	HANOVER ELEMENTARY	7 (11)		
223	Barnes	0622	HANOVER HIGH	10 (25)		
223	Barnes	0628	LINN ELEMENTARY	4 (20)		
223	Barnes	0630	LINN HIGH	10 (7)		
225	Fowler	0684	FOWLER ELEMENTARY		5 (11)	
229	Blue Valley	0770	BLUE VALLEY HIGH		11 (196)	11 (208)
229	Blue Valley	0769	BLUE VALLEY NORTH HIGH		11 (372)	11 (390)
229	Blue Valley	7774	BLUE VALLEY NORTHWEST HIGH	10 (388)		11 (340)

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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
229	Blue Valley	7777	BLUE VALLEY WEST HIGH			11 (323)
229	Blue Valley	0783	COTTONWOOD POINT ELEM.	4 (63)	5 (89)	5 (89)
229	Blue Valley	0785	HARMONY ELEMENTARY	4 (109)	5 (107)	
229	Blue Valley	7775	HEARTLAND ELEMENTARY	4 (88)	5 (86)	
229	Blue Valley	0780	INDIAN VALLEY ELEMENTARY		5 (51)	
229	Blue Valley	0756	LAKEWOOD ELEMENTARY	4 (91)		5 (94)
229	Blue Valley	0773	LEAWOOD ELEMENTARY	4 (56)	5 (76)	5 (76)
229	Blue Valley	0777	MISSION TRAIL ELEMENTARY	4 (92)	5 (81)	
229	Blue Valley	0771	MORSE ELEMENTARY	4 (94)		
229	Blue Valley	0779	OVERLAND TRAIL ELEMENTARY	4 (92)	5 (70)	
229	Blue Valley	0781	OVERLAND TRAIL MIDDLE			8 (199)
229	Blue Valley	0767	OXFORD MIDDLE			8 (182)
229	Blue Valley	7773	PRAIRIE STAR ELEMENTARY	4 (76)		5 (67)
229	Blue Valley	0768	STANLEY ELEMENTARY	4 (103)	5 (95)	
229	Blue Valley	7788	SUNSET RIDGE ELEMENTARY	4 (99)		
229	Blue Valley	0775	TOMAHAWK RIDGE ELEMENTARY	4 (61)		5 (65)
229	Blue Valley	0772	VALLEY PARK ELEMENTARY		5 (48)	
230	Spring Hill	0789	HILLTOP ELEMENTARY	4 (18)	5 (15)	
230	Spring Hill	0792	SPRING HILL MIDDLE			8 (112)
231	Gardner Edgerton	0812	EDGERTON ELEMENTARY	4 (34)		
231	Gardner Edgerton	0808	GARDNER EDGERTON HIGH			11 (185)
233	Olathe	2785	BENTWOOD ELEMENTARY	4 (77)		
233	Olathe	2786	CALIFORNIA TRAIL JHS	7 (252)		
233	Olathe	0847	FRONTIER TRAIL JUNIOR HIGH	7 (258)		
233	Olathe	2781	GREEN SPRINGS ELEMENTARY	4 (60)	5 (80)	5 (78)
233	Olathe	0872	HAVENCROFT ELEMENTARY	4 (42)	5 (61)	
233	Olathe	0875	HERITAGE ELEMENTARY		5 (59)	
233	Olathe	0863	INDIAN TRAIL JUNIOR HIGH	7 (150)		
233	Olathe	0868	MEADOW LANE ELEMENTARY	4 (61)	5 (61)	
233	Olathe	0871	NORTHVIEW ELEMENTARY			5 (47)
233	Olathe	2783	PLEASANT RIDGE ELEMENTARY		5 (75)	5 (73)
233	Olathe	0856	PRAIRIE CENTER ELEMENTARY		5 (60)	
233	Olathe	0846	REGENCY PLACE	4 (62)	5 (62)	5 (62)
233	Olathe	0870	ROLLING RIDGE ELEMENTARY		5 (57)	
233	Olathe	0874	SCARBOROUGH ELEMENTARY		5 (62)	
233	Olathe	0855	WALNUT GROVE ELEMENTARY		5 (49)	5 (52)
235	Uniontown	0966	WEST BOURBON ELEMENTARY	4 (43)		
237	Smith Center	1010	SMITH CENTER ELEMENTARY			5 (30)

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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
238	West Smith County	1032	KENSINGTON HIGH	7 (20)		11 (12)
241	Wallace County	1106	WALLACE COUNTY HIGH	10 (20)		
242	Weskan	1120	WESKAN ELEMENTARY		5 (12)	
242	Weskan	1122	WESKAN HIGH		11 (14)	11 (14)
243	Lebo Waverly	1138	WAVERLY ELEMENTARY	4 (19)		
245	LeRoy Gridley	1178	GRIDLEY ELEMENTARY	7 (12)		5 (9)
245	LeRoy Gridley	1174	LEROY ELEMENTARY			5 (6)
246	Northeast	1194	NORTHEAST ELEMENTARY	4 (40)		
248	Girard	1260	GIRARD MIDDLE			8 (97)
249	Frontenac	1292	FRONTENAC JR/SR HIGH			8 (50) 11 (47)
251	North Lyon County	1346	ADMIRE ELEMENTARY			8 (16)
251	North Lyon County	1350	AMERICUS ELEMENTARY	7 (33)		
251	North Lyon County	1360	READING ELEMENTARY			5 (10) 8 (12)
252	Southern Lyon County	1394	OLPE HIGH			8 (27)
253	Emporia	1450	BUTCHER CHILDREN'S SCHOOL	4 (19)		
253	Emporia	1414	VILLAGE ELEMENTARY	4 (80)		
253	Emporia	1416	WALNUT ELEMENTARY	4 (49)		
256	Marmaton Valley	1538	MARMATON VALLEY HIGH			11 (42)
259	Wichita	1708	BOSTIC TRADITIONAL MAGNET			5 (54)
259	Wichita	1715	LEVY SPECIAL EDUCATION CNTR.	4 (*)	5 (*)	
259	Wichita	1724	L'OUVERTURE COMPUTER MAGNET	4 (50)		
259	Wichita	1823	NORTHEAST MAGNET HIGH		11 (129)	
260	Derby	1936	WINETEER ELEMENTARY	4 (92)		
264	Clearwater	2011	CLEARWATER ELEMENTARY WEST	4 (80)		
266	Maize	2045	MAIZE ELEMENTARY	4 (208)		
267	Renwick	2062	ANDALE ELEMENTARY-MIDDLE	4 (44)		
267	Renwick	2066	COLWICH ELEMENTARY	4 (41) 7 (38)		
267	Renwick	2068	GARDEN PLAIN ELEMENTARY	7 (34)	8 (45)	
267	Renwick	2074	ST. MARKS ELEMENTARY	4 (45) 7 (25)	8 (29)	5 (34) 8 (29)
268	Cheney	2090	CHENEY ELEMENTARY	4 (63)		
269	Palco	2114	PALCO ELEMENTARY			5 (11)
272	Waconda	2186	TIPTON ELEMENTARY	4 (10) 7 (9)	5 (6)	5 (6)

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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
274	Oakley	2258	MONUMENT ELEMENTARY	4 (27)		
274	Oakley	2266	OAKLEY SR HIGH			11 (23)
275	Triplains	2286	WINONA ELEMENTARY	4 (8)	5 (6)	
279	Jewell	2374	RANDALL MIDDLE			8 (8)
281	Hill City	2412	HILL CITY ELEMENTARY	4 (26)		
281	Hill City	2416	HILL CITY HIGH			11 (30)
281	Hill City	2414	LONGFELLOW MIDDLE			8 (39)
282	West Elk	2448	SEVERY ELEMENTARY			5 (13)
287	West Franklin	2572	WILLIAMSBURG HIGH		11 (14)	
288	Central Heights	2585	CENTRAL HEIGHTS ELEMENTARY			5 (49)
290	Ottawa	2641	EISENHOWER ELEMENTARY	4 (23)		
290	Ottawa	2642	EUGENE FIELD ELEMENTARY	4 (32)		
291	Grinnell Schools	2672	GRINNELL HIGH	10 (11)		
291	Grinnell Schools	2670	GRINNELL MIDDLE		8 (8)	
292	Wheatland	2690	WHEATLAND MIDDLE/SR. HIGH	10 (17)		
294	Oberlin	2740	DECATUR COMMUNITY JR/SR HIGH			11 (43)
297	St. Francis Schools	2812	ST. FRANCIS ELEMENTARY	4 (24)		
297	St. Francis Schools	2816	ST. FRANCIS HIGH			11 (38)
298	Lincoln	2840	LINCOLN ELEMENTARY	4 (24)		
300	Commanche County	2890	SOUTH CENTRAL HIGH	10 (28)	11 (21)	
302	Smoky Hill	2928	RANSOM JR SR HIGH			8 (12)
303	Ness City	2948	NESS CITY ELEMENTARY	4 (23)		
303	Ness City	2952	NESS CITY HIGH			11 (37)
305	Salina	2985	CORONADO ELEMENTARY	4 (48)	5 (52)	
305	Salina	3000	MEADOWLARK RIDGE ELEM.	4 (52)	5 (54)	
305	Salina	3014	STEWART ELEMENTARY	4 (58)		
306	Southeast of Saline	3052	SOUTHEAST SALINE HIGH	10 (64)		
308	Hutchinson	3118	MORGAN ELEMENTARY	4 (48)	5 (51)	
309	Nickerson	3164	NICKERSON ELEMENTARY	4 (39)		
312	Haven Public Schools	3244	MT. HOPE ELEMENTARY	4 (17)		
312	Haven Public Schools	3240	PARTRIDGE ELEMENTARY	4 (12) 7 (16)	5 (14)	
312	Haven Public Schools	3238	YODER ELEMENTARY	4 (12) 7 (9)	5 (8)	
314	Brewster	3278	BREWSTER HIGH			8 (16)

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316	Golden Plains	3381	GOLDEN PLAINS ELEMENTARY	4 (13)		
318	Atwood	3348	ATWOOD ELEMENTARY	7 (30)		
318	Atwood	3350	ATWOOD HIGH	10 (32)		11 (33)
320	Wamego	3399	WAMEGO WEST ELEMENTARY		5 (88)	5 (88)
321	Kaw Valley	3420	EMMETT ELEMENTARY	4 (*)		5 (7) 8 (7)
321	Kaw Valley	3432	ST. MARYS HIGH	10 (47)		11 (53)
322	Onaga Havens Wheaton	3456	ONAGA ELEMENTARY	7 (19)		
323	Pottawatomie West	3488	ST. GEORGE ELEMENTARY	4 (38)	5 (43)	
323	Pottawatomie West	3492	WESTMORELAND ELEMENTARY	4 (22)		
325	Phillipsburg	3540	PHILLIPSBURG MIDDLE			8 (54)
327	Ellsworth	3594	ELLSWORTH ELEMENTARY	4 (45)		
328	Loraine	3640	QUIVIRA HEIGHTS HIGH		11 (23)	
328	Loraine	3638	QUIVIRA HEIGHTS JR HIGH	4 (19)		
328	Loraine	3634	WILSON ELEMENTARY	4 (9)		
328	Loraine	3636	WILSON HIGH		11 (19)	
329	Mill Creek Valley	3667	MAPLE HILL ELEMENTARY	4 (*)		
329	Mill Creek Valley	3665	MILL CREEK VALLEY JR HIGH			8 (43)
330	Wabaunsee East	3684	ESKRIDGE ELEMENTARY	4 (16)		
332	Cunningham	3750	CUNNINGHAM HIGH	10 (29)		
333	Concordia	3780	CONCORDIA ELEMENTARY	4 (75)		
336	Holton	3886	CENTRAL ELEMENTARY			5 (78)
339	Jefferson Co North	3950	JEFFERSON CO. NO. ELEM/MIDDLE	4 (41)	5 (44)	
339	Jefferson Co North	3948	JEFFERSON COUNTY NORTH HIGH	10 (31)		
340	Jefferson West	3969	JEFFERSON WEST INTERMEDIATE		5 (82)	5 (82)
343	Perry	4029	PERRY MIDDLE			8 (98)
345	Seaman	4068	PLEASANT HILL ELEMENTARY		5 (47)	
345	Seaman	4072	WEST INDIANOLA ELEMENTARY	4 (43)		
347	Kinsley Offerle	4118	KINSLEY HIGH			11 (21)
348	Baldwin	4144	MARION SPRINGS ELEMENTARY	4 (12)	5 (13)	
341	Macksville	4196	MACKSVILLE ELEMENTARY	4 (19)		
354	Claflin	4294	CLAFLIN ELEMENTARY	4 (26)	5 (29)	
355	Ellinwood	4318	ELLINWOOD ELEMENTARY	4 (39)		
357	Belle Plaine	4364	BELLE PLAINE HIGH			11 (44)

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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
360	Caldwell	4422	CALDWELL HIGH		11 (22)	
362	Prairie View	4490	FONTANA ELEMENTARY			5 (12)
362	Prairie View	4502	PARKER ELEMENTARY			5 (20)
364	Marysville	4545	MARYSVILLE ELEMENTARY	4 (45)		
364	Marysville	4548	MARYSVILLE JR/SR HS			11 (91)
365	Garnett	4592	GREELEY ELEMENTARY	4 (*)		
366	Yates Center	4639	YATES CENTER ELEMENTARY			5 (36) 8 (55)
369	Burrton	4734	BURRTON ELEMENTARY		8 (20)	
372	Silver Lake	4776	SILVER LAKE ELEMENTARY		5 (56)	
374	Sublette	4834	SUBLETTE ELEMENTARY			5 (30)
374	Sublette	4838	SUBLETTE MIDDLE		8 (32)	
375	Circle	4850	BENTON ELEMENTARY	4 (39)		
377	Atchison County	4894	ATCHISON CO. COMMUNITY HIGH			11 (68)
377	Atchison County	4916	ATCHISON CO. COMMUNITY MIDDLE			8 (56)
377	Atchison County	4890	EFFINGHAM ELEMENTARY	4 (21)		
379	Clay Center	4970	GARFIELD ELEMENTARY	4 (74)		
379	Clay Center	4982	GREEN ELEMENTARY		5 (6)	5 (6)
379	Clay Center	4994	LONGFORD ELEMENTARY	4 (6)	5 (*)	
379	Clay Center	4998	MORGANVILLE ELEMENTARY	4 (14)		
379	Clay Center	5014	WAKEFIELD ELEMENTARY	4 (27) 7 (23)	5 (21)	5 (21)
379	Clay Center	5016	WAKEFIELD HIGH			11 (19)
380	Vermillion	5038	FRANKFORT HIGH	10 (27)		
383	Manhattan	5135	ANTHONY MIDDLE SCHOOL	7 (191)		
383	Manhattan	5113	BERGMAN ELEMENTARY		5 (60)	
383	Manhattan	5122	EUGENE FIELD ELEMENTARY	4 (17)	5 (6)	
383	Manhattan	5130	T. ROOSEVELT ELEMENTARY	4 (25)		
384	Blue Valley	5160	OLSBURG ELEMENTARY	4 (21)		
385	Andover	5186	ANDOVER CENTRAL HIGH SCHOOL	10 (117)		
385	Andover	5180	ANDOVER HIGH	10 (101)		
385	Andover	5181	ROBERT M. MARTIN ELEMENTARY	4 (53)		
385	Andover	5182	MEADOWLARK ELEMENTARY	4 (58)		
386	Madison Virgil	5198	MADISON ELEMENTARY	4 (21)		
399	Paradise	5486	NATOMA ELEMENTARY		5 (7)	
403	Otis Bison	5598	OTIS-BISON INTERMEDIATE	4 (12)		
406	Wathena	5674	WATHENA ELEMENTARY	4 (29)		
407	Russell	5710	LURAY-LUCAS ELEMENTARY	4 (10)		

Buildings Meeting
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Schools with an asterisk (*) tested 5 or fewer students

USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
410	Durham Hillsboro	5812	HILLSBORO ELEMENTARY	4 (52)		
410	Durham Hillsboro	5814	HILLSBORO HIGH		11 (63)	
410	Durham Hillsboro	5820	HILLSBORO MIDDLE	7 (62)		
411	Goessel	5834	GOESSEL ELEMENTARY	4 (30)	5 (21)	5 (21)
411	Goessel	5836	GOESSEL HIGH	7 (34)	11 (25)	
412	Hoxie	5852	HOXIE ELEMENTARY			8 (33)
418	McPherson	6028	EISENHOWER ELEMENTARY	4 (46)		5 (52)
419	Canton Galva	6068	GALVA ELEMENTARY			5 (13)
420	Osage City	6088	OSAGE CITY ELEMENTARY	4 (53)		
422	Greensburg	6118	DELMER DAY ELEM/MIDDLE	4 (22)		
423	Moundridge	6142	MOUNDRIDGE HIGH		11 (41)	
423	Moundridge	6146	MOUNDRIDGE MIDDLE	7 (31)	8 (28)	
424	Mullinville	6156	MULLINVILLE ELEMENTARY		5 (6)	
426	Pike Valley	6206	PIKE VALLEY HIGH			11 (32)
426	Pike Valley	6194	PIKE VALLEY JUNIOR HIGH	7 (20)		
427	Belleville	6222	BELLEVILLE MIDDLE	7 (33)		
428	Great Bend	6256	EISENHOWER ELEMENTARY			5 (44)
428	Great Bend	6280	GREAT BEND MIDDLE			8 (238)
429	Troy	6324	TROY ELEMENTARY	4 (28)		
437	Auburn Washburn	6512	AUBURN ELEMENTARY	4 (50)		
437	Auburn Washburn	6517	INDIAN HILLS ELEMENTARY	4 (74)		5 (64)
437	Auburn Washburn	6530	JAY SHIDELER ELEMENTARY	4 (77)		5 (71)
438	Skyline	6560	SKYLINE HIGH			11 (28)
441	Sabetha	6618	SABETHA ELEMENTARY	4 (49)		
441	Sabetha	6622	WETMORE ELEMENTARY	4 (12)		
441	Sabetha	6624	WETMORE HIGH	10 (15)		
442	Nemaha Valley	6654	NEMAHA VALLEY HIGH		11 (52)	
443	Dodge City	6680	NORTHWEST ELEMENTARY			5 (69)
444	Little River	6734	WINDOM ELEMENTARY-MIDDLE			5 (22)
447	Cherryvale	6876	CHERRYVALE HIGH			8 (51)
449	Easton	6924	SALT CREEK VALLEY ELEM	4 (57)		
450	Shawnee Heights	6940	SHAWNEE HEIGHTS ELEMENTARY			5 (73)
450	Shawnee Heights	6946	TECUMSEH NORTH ELEMENTARY	4 (36)		

Buildings Meeting
Standards of Excellence
2001-2002
(Number of Students Tested Appears in Parentheses After Grade Level)
Schools with an asterisk (*) tested 5 or fewer students

USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
451	B & B	6962	B AND B HIGH	7 (20) 10 (25)		
451	B &B	6964	ST. BENEDICT ELEMENTARY		5 (22)	
452	Stanton County	6980	BIG BOW ELEMENTARY	4 (8)		
454	Burlingame	7057	SCHUYLER ELEMENTARY	4 (20)		
455	Hillcrest Rural	7074	HILLCREST ELEMENTARY	4 (11)		
457	Garden City	7119	FLORENCE WILSON ELEMENTARY	4 (51)		
457	Garden City	7131	GERTRUDE WALKER ELEMENTARY	4 (52)		
459	Bucklin	7184	BUCKLIN ELEMENTARY	4 (20)		
460	Hesston	7206	HESSTON ELEMENTARY	4 (61)		
460	Hesston	7208	HESSTON MIDDLE	7 (55)	8 (57)	
463	Udall	7270	UDALL ELEMENTARY	4 (27)		
465	Winfield	7314	SOUTH VERNON ELEMENTARY			5 (9)
465	Winfield	7329	WEBSTER ELEMENTARY	4 (24)	5 (20)	5 (20)
470	Arkansas City	7448	ROOSEVELT ELEMENTARY	4 (40)		
471	Dexter	7492	DEXTER ELEMENTARY	4 (19)		
473	Chapman	7546	ENTERPRISE ELEMENTARY	4 (14)		
475	Junction City	7596	CUSTER HILL ELEMENTARY	4 (34)		5 (28)
475	Junction City	7598	EISENHOWER ELEMENTARY	4 (52)		5 (53)
475	Junction City	7600	FORT RILEY ELEMENTARY	4 (47)		
475	Junction City	7592	GRANDVIEW ELEMENTARY	4 (14)		
475	Junction City	7606	LINCOLN ELEMENTARY	4 (34)		
475	Junction City	7624	MILFORD ELEMENTARY	4 (18)		
475	Junction City	7608	MORRIS HILL ELEMENTARY	4 (19)		
475	Junction City	7610	SHERIDAN ELEMENTARY	4 (37)	5 (45)	5 (48)
475	Junction City	7630	WARE ELEMENTARY	4 (93)		
475	Junction City	7612	WASHINGTON ELEMENTARY	4 (26)		
476	Copeland	7651	SOUTH GRAY JUNIOR HIGH	7 (18)	8 (23)	
482	Dighton	7782	DIGHTON HIGH		11 (28)	
483	Kismet Plains	7800	PLAINS ELEMENTARY	4 (28)		
488	Axtell	7912	AXTELL HIGH		8 (17) 11 (20)	
488	Axtell	7916	BERN HIGH	7 (12)		
489	Hays	7952	FELTEN MIDDLE			8 (173)
489	Hays	7946	LINCOLN ELEMENTARY	4 (26)		
489	Hays	7956	O'LOUGHLIN ELEMENTARY	4 (50)		5 (60)
489	Hays	7959	ROOSEVELT ELEMENTARY	4 (62)		
491	Eudora	8029	EUDORA MIDDLE SCHOOL	7 (99)		
493	Columbus	8086	SCAMMON ELEMENTARY	4 (15)		
493	Columbus	8090	SPENCER ELEMENTARY	4 (7)		

Buildings Meeting
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2001-2002
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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
496	Pawnee Heights	8170	PAWNEE HEIGHTS HIGH	10 (13)		
496	Pawnee Heights	8166	PAWNEE HEIGHTS WEST ELEM.	4 (8)	5 (10)	
497	Lawrence	8186	GRANT ELEMENTARY	4 (6)		
497	Lawrence	8198	HILLCREST ELEMENTARY	4 (55)	5 (59)	
497	Lawrence	8213	LANGSTON HUGHES ELEM.	4 (34)	5 (38)	
497	Lawrence	8202	QUAIL RUN ELEMENTARY	4 (65)	5 (71)	
497	Lawrence	8220	RIVERSIDE ELEMENTARY			5 (14)
497	Lawrence	8189	SUNFLOWER ELEMENTARY	4 (60)		
497	Lawrence	8222	WAKARUSA ELEMENTARY	4 (46)	5 (40)	
498	Valley Heights	8246	VALLEY HEIGHTS ELEMENTARY - WATERVILLE			5 (24)
500	Kansas City	8322	SUMNER ACADEMY OF ARTS AND SCIENCES		11 (177)	
500	Kansas City	8354	WHITE CHURCH ELEMENTARY			5 (49)
506	Labette County	8652	ALTAMONT ELEMENTARY			8 (37)
506	Labette County	8658	BARTLETT ELEMENTARY		5 (13)	
506	Labette County	8666	EDNA ELEMENTARY	4 (14)		
506	Labette County	8684	MOUND VALLEY ELEMENTARY	7 (15)		
512	Shawnee Mission	8776	APACHE ELEMENTARY	4 (47)		
512	Shawnee Mission	8778	ARROWHEAD ELEMENTARY	4 (21)		
512	Shawnee Mission	8782	BELINDER ELEMENTARY	4 (52)	5 (62)	
512	Shawnee Mission	8784	BLUEJACKET/FLINT ELEMENTARY			5 (101)
512	Shawnee Mission	8786	BRIARWOOD ELEMENTARY	4 (73)	5 (69)	5 (67)
512	Shawnee Mission	8787	BROKEN ARROW ELEMENTARY	4 (87)		5 (86)
512	Shawnee Mission	8788	BROOKRIDGE ELEMENTARY			5 (74)
512	Shawnee Mission	8790	BROOKWOOD ELEMENTARY	4 (51)	5 (65)	5 (63)
512	Shawnee Mission	8791	CHRISTA MCAULIFFE ELEMENTARY	4 (74)	5 (85)	5 (89)
512	Shawnee Mission	8794	CORINTH ELEMENTARY	4 (52)		5 (44)
512	Shawnee Mission	8796	CRESTVIEW ELEMENTARY	4 (37)		
512	Shawnee Mission	8814	D.E. BONJOUR ELEMENTARY	4 (39)		

Buildings Meeting
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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
512	Shawnee Mission	8774	EAST ANTIOCH ELEMENTARY			5 (39)
512	Shawnee Mission	8806	HIGHLANDS ELEMENTARY	4 (46)		
512	Shawnee Mission	8874	INDIAN HILLS MIDDLE	7 (305)		8 (261)
512	Shawnee Mission	8880	INDIAN WOODS MIDDLE			8 (384)
512	Shawnee Mission	8808	JOHN DIEMER ELEMENTARY			5 (66)
512	Shawnee Mission	8819	MILL CREEK ELEMENTARY	4 (63)	5 (73)	5 (67)
512	Shawnee Mission	8876	MISSION VALLEY MIDDLE	7 (334)		8 (305)
512	Shawnee Mission	8823	OAK PARK ELEMENTARY	4 (41)		
512	Shawnee Mission	8828	PAWNEE ELEMENTARY	4 (77)		5 (84)
512	Shawnee Mission	8832	PRAIRIE ELEMENTARY	4 (64)	5 (59)	5 (59)
512	Shawnee Mission	8834	R. BENNINGHOVEN ELEMENTARY	4 (88)		
512	Shawnee Mission	8836	RISING STAR ELEMENTARY	4 (75)		
512	Shawnee Mission	8840	ROELAND PARK ELEMENTARY			5 (21)
512	Shawnee Mission	8838	ROELAND ELEMENTARY	4 (42)		
512	Shawnee Mission	8886	SHAWNEE MISSION EAST HIGH	10 (512)		
512	Shawnee Mission	8892	SHAWNEE MISSION SOUTH HIGH	10 (444)	11 (445)	
512	Shawnee Mission	8854	SOMERSET ELEMENTARY	4 (37)		
512	Shawnee Mission	8856	SOUTH PARK ELEMENTARY	4 (37)		
512	Shawnee Mission	8857	SUNFLOWER ELEMENTARY	4 (101)		
512	Shawnee Mission	8858	TOMAHAWK ELEMENTARY	4 (49)		5 (39)
512	Shawnee Mission	8884	TRAILRIDGE MIDDLE			8 (308)
512	Shawnee Mission	8860	TRAILWOOD ELEMENTARY	4 (41)		5 (31)
512	Shawnee Mission	8875	WEST ANTIOCH ELEMENTARY	4 (21)		

Buildings Meeting
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USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
512	Shawnee Mission	8864	WESTWOOD VIEW ELEMENTARY			5 (35)
615		6858	INDEPENDENCE BIBLE HS	10 (6)		
659		7042	ST. PAUL - LEAVENWORTH		8 (9)	
663		4728	TRINITY – PAOLA	4(7)	5 (*) 8 (6)	
664		9021	HOPE LUTHERAN – SHAWNEE	4 (15) 7 (21)	8 (10)	
665		8570	TOPEKA LUTHERAN		8 (17)	8 (17)
669		7344	TRINITY - WINFIELD			5 (6)
694		9015	ACCELERATED SCHOOLS	4 (30) 7 (23)	5 (28) 8 (18)	8 (9)
695		9088	THE INDEPENDENT SCHOOL		5 (59) 11 (52)	
698		7784	ASCENSION - OVERLAND PARK	7 (46)		8 (23)
699		1912	KAPAUN-MT. CARMEL HIGH		11 (198)	
701		4726	HOLY TRINITY - PAOLA		8 (9)	
702		1444	SACRED HEART - EMPORIA			5 (15)
703		2662	SACRED HEART - OTTAWA		5 (17)	
708		8232	ST. JOHN - LAWRENCE		5 (46)	5 (46)
710		7044	IMMACULATA HIGH		11 (36)	
714		8565	CHRIST THE KING	7 (20)		
716		8556	MOST PURE HEART OF MARY		8 (45)	
719		4570	ST. GREGORY			5 (8)
725		8422	ST. PETER'S CATHEDRAL			5 (19)
733		9002	CURE' OF ARS	7 (72)	8 (50)	8 (49)
735		9019	HOLY SPIRIT - OVERLAND PARK	7 (52)	8 (45)	5 (52) 8 (45)
736		9006	HOLY TRINITY - LENEXA		8 (80)	
737		9013	NATIVITY	7 (76)		5 (77) 8 (78)
739		9024	QUEEN OF THE HOLY ROSARY		5 (17) 8 (19)	8 (19)
740		9014	ST. AGNES			5 (34) 8 (51)
741		9016	ST. ANN		8 (47)	8 (46)
742		9018	ST. JOSEPH - SHAWNEE			8 (75)
743		882	ST. PAUL		8 (18)	8 (18)
745		9000	BISHOP MIEGE HIGH			11 (180)
746		9020	ST. THOMAS AQUINAS OVERLAND PK	10 (293)	11 (304)	
750		5252	ST. MARY'S GRADE - ELLIS		5 (6)	5 (6)

Buildings Meeting
Standards of Excellence
2001-2002
(Number of Students Tested Appears in Parentheses After Grade Level)
Schools with an asterisk (*) tested 5 or fewer students

USD	USD NAME	BLDG #	BUILDING NAME	MATH GRADE	READING GRADE	WRITING GRADE
754		5152	MANHATTAN CATHOLIC ELEMENTARY			5 (36)
756		2152	SACRED HEART GRADE - PLAINVILLE		5 (11)	
759		2246	ST. JOHN'S - BELOIT			11 (14)
760		7984	THOMAS MORE PREP-MARIAN HIGH - HAYS	10 (65)	11 (83)	
761		7642	ST. FRANCIS XAVIER'S HIGH - JC			8 (12)
763		2208	TIPTON HIGH	10 (10)		11 (9)
765		5580	ST. JAMES - AUGUSTA	4 (15)		
766		5904	ST. PATRICK ELEM. - CHANUTE		5 (17)	
768		4358	ST. JOSEPH ELEM. - CONWAY SPRINGS		5 (28)	
769		1952	ST. MARY ELEMENTARY - DERBY	4 (26)	5 (23)	
770		940	ST. MARY ELEMENTARY - FORT SCOTT	4 (6)	5 (12)	
772		3144	HOLY CROSS ELEM. - HUTCHINSON	4 (21)		5 (*)
773		3148	ST. TERESA ELEM. - HUTCHINSON		5 (23)	
774		6860	ST. ANDREW ELEM. - INDEPENDENCE		5 (8)	5 (*)
775		3744	ST. PATRICK ELEM. - KINGMAN		5 (19)	
776		6060	ST. JOSEPH ELEM. -MCPHERSON		5 (8)	
777		4828	ST. MARY CATH. - NEWTON	7 (13)		
781		2040	ST. PETER ELEMENTARY	4 (43)	5 (42)	
783		1856	ALL SAINTS ELEM.	4 (29)		
784		1860	BLESSED SACRAMENT ELEM.		8 (35)	
787		1882	ST. ANNE ELEM.	7 (25)		
788		1885	ST. ELIZABETH ANN SETON - WICHITA		5 (86)	8 (60)
789		1886	ST. FRANCIS OF ASSISI ELEM.		5 (86)	
790		1888	ST. JOSEPH ELEM. - WICHITA	7 (17)		
792		1892	ST. MARGARET MARY ELEM.	7 (24)		
794		1896	ST. THOMAS AQUINAS ELEMENTARY	7 (66)	5 (74)	
798		1334	ST. MARY/COLGAN HIGH - PITTSBURG		11 (40)	
799		1910	BISHOP CARROLL HIGH			11 (228)
801		6304	ST. PATRICK	4 (19)		
901		4727	LAKEMARY CENTER	10 (10)	11 (10)	
902		1881	HEARTSPRING	10 (6)	11 (6)	

APPENDIX C

Gaps in average reading scale scores, by race/ethnicity, grade 4 public schools: By state, 1992–2002

Grade 4

	White score minus Black score					White score minus Hispanic score				
	Accommodations not permitted			Accommodations permitted		Accommodations not permitted			Accommodations permitted	
	1992	1994	1998	1998	2002	1992	1994	1998	1998	2002
Nation (Public)[1]	32	38*	32	31	29	28	36	30	31	28
Alabama	30	33	29	31	30	***	***	***	***	***
Arizona	22	31	28	28	21	23 *	31	37	31	32
Arkansas	29	34	33	32	33	***	***	***	***	18
California ‡	36	30	29	31	27	37	40	39	35	31
Colorado	21	29	28	30	—	20	29	27	26	—
Connecticut	34	45	35	34	31	43	51 *	39	41	33
Delaware	26	28	22	30	24	***	***	17	42	21
Florida	33	36	31	31	30	15	24	20	20	19
Georgia	28	37 *	32	30	26	***	***	***	***	26
Hawaii	7	17	9	11	12	19	25	19	17	16
Idaho	***	—	—	—	***	23	—	—	—	27
Indiana	25	31	—	—	23	***	***	—	—	9
Iowa ‡	18	39 *	30	31	18	***	***	***	***	22
Kansas ‡	—	—	34 *	30	20	—	—	12	25	21
Kentucky	18	24	23	21	23	***	***	***	***	***
Louisiana	26	35	38 *	38 *	30	***	***	***	***	***
Maine	***	***	***	***	***	***	***	***	***	***
Maryland	29	37	36	34	30	24	***	20	18	21
Massachusetts	26	33	28	26	27	34	47 *	36	34	32
Michigan	35	—	36	36	31	***	—	22	22	21
Minnesota ‡	34	45	37	40	27	***	***	***	***	26
Mississippi	31	33	25	26	29	***	***	***	***	***
Missouri	30	30	35	33	28	***	***	***	***	***
Montana ‡	—	***	***	***	***	—	***	***	***	***
Nebraska	28	33	—	—	17	19	24	—	—	23
Nevada	—	—	27	30	22	—	—	23	25	22
New Hampshire	***	***	***	***	—	***	***	***	***	—
New Mexico	21	24	28	26	***	23	23	25	27	21
New York ‡	27	36	36	37	32	42	37	39	40	30
North Carolina	26	32	28	30	27	***	***	24	***	19
North Dakota ‡	***	***	—	—	***	***	***	—	—	***
Ohio	23	—	—	—	27	***	—	—	—	***
Oklahoma	22 *	—	31	30	32	16	—	14	21	23
Oregon	—	—	25	25	20	—	—	32	39 *	24
Pennsylvania	36	46	—	—	37	35	***	—	—	31
Rhode Island	31	28	35	34	26	40	32	50 *	48 *	32
South Carolina	27	36 *	27	29	26	***	***	***	***	***
Tennessee ‡	26	31	29	25	26	***	***	***	***	28
Texas	24	36	39	39	30	23	28	26	30	24
Utah	***	***	***	***	***	21	27	34 *	29	23
Vermont	—	—	—	—	***	—	—	—	—	***
Virginia	26	32	24	27	27	***	13	26 *	18	9
Washington ‡	—	19	19	17	14	—	32	25	22	23
West Virginia	***	13	25	23	13	***	***	***	***	***
Wisconsin ‡	28	24	20	41	—	18	24	20	27	—
Wyoming	***	***	***	***	***	19	15	15	15	17
Other Jurisdictions										
District of Columbia	62	73 *	71	72 *	60	57	64	67	74	55
DDESS [2]	—	—	20	19	16	—	—	18	14	9
DoDDS [3]	—	18	18	18	15	—	10	13	16	7
Guam	***	***	—	—	***	***	***	—	—	***
Virgin Islands	***	—	***	***	***	***	—	***	***	***

— Indicates that the jurisdiction did not participate or did not meet minimum participation guidelines for reporting.
‡ Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2002.
* Significantly different from 2002 when only one jurisdiction or the nation is being examined.
*** Sample size is insufficient to permit a reliable estimate.
[1] National results that are presented for assessments prior to 2002 are based on the national sample, not on aggregated state assessment samples.
[2] Department of Defense Domestic Dependent Elementary and Secondary Schools.
[3] Department of Defense Dependents Schools (Overseas).

Gaps in average reading scale scores, by race/ethnicity, grade 8 public schools: By state, 1998 and 2002

Grade 8

	White score minus Black score			White score minus Hispanic score		
	Accommodations not permitted	Accommodations permitted		Accommodations not permitted	Accommodations permitted	
	1998	1998	2002	1998	1998	2002
Nation (Public)[1]	28	26	27	26	27	26
Alabama	27	28	30	***	***	***
Arizona	26	21	17	26	25	25
Arkansas	29	29	28	***	***	***
California ‡	25	30	23	30	30	27
Colorado	25	22	—	29	26	—
Connecticut	35	32	38	31 *	30	38
Delaware	25	28	23	17	15	25
Florida	32	28	25	17	17	17
Georgia	28	27	22	***	***	25
Hawaii	***	***	10	***	***	17
Idaho	—	—	***	—	—	21
Indiana	—	—	20	—	—	***
Kansas ‡	19	22	29	23	31	20
Kentucky	22	19	19	***	***	***
Louisiana	27	26	28	***	***	***
Maine	***	***	***	***	***	***
Maryland	30	32	28	10	11	21
Massachusetts	25	27	31	30	32	31
Michigan	—	—	28	—	—	***
Minnesota ‡	34	38	—	***	***	—
Mississippi	26	25	28	***	***	***
Missouri	22	23	22	***	***	***
Montana ‡	***	***	***	***	***	***
Nebraska	—	—	27	—	—	22
Nevada	26	23	25	21	22	22
New Mexico	***	***	***	23	20	20
New York ‡	28	28	28	28	28	23
North Carolina	22	25	27	***	***	22
North Dakota ‡	—	—	***	—	—	***
Ohio	—	—	27	—	—	***
Oklahoma	17 *	16 *	29	20	14	17
Oregon ‡	28	30	***	23	32	22
Pennsylvania	—	—	35	—	—	31
Rhode Island	14	22	25	27	29	28
South Carolina	26	25	26	***	***	***
Tennessee ‡	29	29	26	***	***	***
Texas	27	25	30	21	22	26
Utah	***	***	21	14 *	21	30
Vermont	—	—	***	—	—	***
Virginia	23	24	24	15	8	14
Washington ‡	19	25	24	23	27	24
West Virginia	16	14	22	***	***	***
Wisconsin ‡	36	35	—	15	13	—
Wyoming	***	***	***	21	15	18
Other Jurisdictions						
American Samoa	—	—	***	—	—	***
District of Columbia	***	***	***	***	***	***
DDESS [2]	23	30	19	7	2	6
DoDDS [3]	17	19	15	16	12	11
Guam	—	—	***	—	—	***
Virgin Islands	***	***	***	***	***	***

— Indicates that the jurisdiction did not participate or did not meet minimum participation guidelines for reporting.
‡ Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2002.
* Significantly different from 2002 when only one jurisdiction or the nation is being examined.
*** Sample size is insufficient to permit a reliable estimate.
[1] National results that are presented for assessments prior to 2002 are based on the national sample, not on aggregated state assessment samples.
[2] Department of Defense Domestic Dependent Elementary and Secondary Schools.
[3] Department of Defense Dependents Schools (Overseas).
NOTE: Score gaps are calculated based on differences between unrounded average scale scores.
Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited

APPENDIX D
Kansas Special Education Funding Options:
A Policy Brief

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Presented to the
Kansas Special Education Advisory Council

April 9, 2002

Adopted by the Kansas Special Education Advisory Council

February 25, 2003

Goal of Special Education Funding: To provide local school districts with supplemental funds for educating students who experience disabilities.

Four Funding Approaches

1. Resource Based (current Kansas funding formula): Districts determine programming needs of special education students and allocate certified special education personnel and paraprofessionals to meet those needs. State provides aid to cover either a portion of all resource costs or a more limited set of specific allowable resource costs. In Kansas, aid is limited to a specific set of allowable resource costs, i.e., special education personnel and paraprofessionals.

   a. General Advantages:

      - Little incentive to over identify students for special education services. There is no explicit disincentive to over identify students, but there is a practical disincentive for doing so, in that, the additional resource costs of serving over identified students typically exceed the aid that identifying them would generate.
      - Can accommodate varied resource needs across districts.
      - Appears to logically reimburse costs deemed appropriate by experts at the state level.

   b. General Disadvantages:

- Aid allocated only for personnel reimbursement ignores resource costs other than personnel (e.g., materials, supplies, equipment, etc).
- May lead districts to engage in "budget maximizing" behavior (i.e., seeking higher levels of funding by over identifying students, using labels of greater severity, and placing students in more restrictive placements, all of which yields more teachers and thus higher levels of funding).
- May lead to higher administrative costs because as districts hire more special education personnel, they also must hire more administrative personnel to supervise them.

c. "Fit" with General Education Formula in Kansas

- Complicating factor: Generally acceptable, all things considered, but state needs to more accurately identify and define "excess cost" (relative to base aid). According to an October 1998 Legislative Post Audit report, the Kansas resource based formula leads to excess cost figures across districts ranging from 69%-137%. Additionally, depending on the way special education personnel are allocated, some cooperatives receive as much as 238% of excess costs.

2. Pupil Weight: One or more categories of student-based funding for special programs, expressed as a multiple of regular education aid.

a. General Advantages:

- Ability to accommodate cost differences by student need.
- Ability to attach pupil weights directly to district general funds giving district administrators flexibility on how funds are used.
- Weighted aid is increased when base aid allocations are increased, unless the legislature consciously chooses to decrease the weight(s).
- Proposed Kansas two-level pupil weight is not an "identification contingent weight" (i.e., the weights are not based on severity categories). This is similar to Augenblick pupil weighting approach, which does not differentiate by level of severity, but rather by size of district, with weights becoming incrementally higher for larger districts.

b. General Disadvantages:

- May create incentives to misclassify and/or misplace students into specific types of disability categories or placements that receive higher reimbursements (Parrish, O'Reilly, Duenas & Wolman, 1997). Additionally, this formula is not linked to student outcomes.
- May stimulate over identification of high incidence disabilities (i.e., learning disabilities and behavioral disorders).
- May stimulate overly restrictive placements in cases where weights are tied to placement.

c. "Fit" with General Education Formula in Kansas:

- Complicating factor: Because the local option budget (LOB) is contingent upon the level of base aid, use of pupil weighting artificially increases the general fund, which allows some districts to raise their LOB more than others because use of the LOB leverage is contingent upon what districts receive as a base.
- Complicating factor: The "low enrollment weighting" component of the general education funding formula creates vastly different amounts of basic funding across districts that may not reflect actual costs or appropriate differences. Although legitimate to some degree, the low enrollment weighting methodology does not appear to be rational, in that, relatively speaking, it appears to over-fund small districts and under-fund larger districts. Although low enrollment weighting may not actually over-fund small districts, in that, these districts may actually need the level of funding they receive, it certainly appears to be under-funding the larger districts. In general, it is important to consider the local general education funding differences created by low enrollment weighting before determining the best way to add on supplemental special education funding.
- Complicating factor: Pupil weights are typically applied to the foundation level in pupil weight programs, but districts have varied capacity to raise revenue above that level (as with the LOB). Pupil weights can never be fully equalized under these circumstances.

3. Census Based: State provides block grants to all schools or districts based on total enrollment of school or district. The block grant is intended to provide services for high incidence, lower need special education students. A separate formula is used for low incidence, high need students.

a. General Advantages:

- Promotes inclusion (partly by detaching labeling from funding but also by imposing budget constraints).
- Montgomery's (1995) research in Vermont notes the following advantages: (a) return of students to home schools; (b) disappearance of regional special education classes; (c) placement neutrality; (d) break down in categorical service delivery models creating links between general and special education (i.e., broader access to special education and related services expertise for all students); (e) increased flexibility in program design; (f) more funding predictability for local school districts; and (g) low reporting burden.
- No incentive to over identify students.
- Typically, provides more equitable allocations across districts.

b. General Disadvantages:

- Feir's (1999) research on census based funding in Pennsylvania reports the following disadvantages: (a) in effect, capped growth of the state's obligation to fund special education; (b) special education share of total local budgets increased; (c) districts with more special education students and higher cost services were least able to control costs; and (d) the formula change did not necessarily change program delivery patterns.
- Some districts will have higher proportions of students with high incidence disabilities than natural proportions would predict.
- Special considerations for districts with high numbers of students with low incidence disabilities are necessary and require extensive adjustments.
- Where numbers of "exceptions" are significant, the census based formula becomes inefficient and too burdensome to implement.
- Legislatures can neglect to increase the level of the special education block grant on an annual basis, even in years when other aid is increased.

c. "Fit" with General Education Formula in Kansas

- Complicating factor: Uneven incidence rates; contrary to the logic of census based funding, disability does not necessarily follow a pattern in which there are relatively more or less students with disabilities in larger or smaller districts.
- Complicating factor: A general education funding formula that is not cost-based and creates widely varied levels of funding across districts. This means that, under a census based formula, special education funding would be allocated equally on top of general education funding that is not allocated equally. As such, under a census based formula, some districts may run a profit from the special education block grant on top of varied general funds, whereas other districts may run a deficit.

4. Percentage Reimbursement: Funding based on a percentage of allowable or actual expenditures.

a. General Advantages:

- Reimbursements may accommodate significant cost differences across districts.
- Reimbursements expand allowable resources beyond staffing.
- State may distribute general education supplemental aid and special education supplemental aid using the same sliding scale, based on the same fiscal capacity measures (if they are good ones).

b. General Disadvantages:

- Compliance burden of accounting for allowable special education costs, potentially encouraging inefficient segregation of resources within districts.

c. "Fit" with General Education Formula in Kansas:

- Complication factor: None, this formula is at least as good as, if not better than, the current resource based funding formula.

Recommendations Regarding Funding Options:

1. Given fundamental problems in the General Education formula associated primarily with low enrollment weighing, a significant change in the Special Education funding formula is not warranted at this time.

2. Given these problems with the General Education formula, maintaining the current resource based Special Education funding formula, or at most moving to a percentage reimbursement formula (see below), is the best option.

3. Moving from the resource based Special Education formula to a percentage reimbursement formula has the advantage of reimbursing districts for other costs in addition to personnel (e.g., materials, supplies, equipment, etc).

3. The pupil weighting formula may be a better option for distributing funds according to local district need, but its tendency to encourage over identification and overly restrictive placements must be taken into consideration under any type of General Education funding formula.

4. A census based funding formula is not warranted at this time primarily because it would extend the existing inequities of the General Education formula. However, given the potentially substantial programmatic advantages of the census based approach, such a Special Education funding formula should be reconsidered if and when a new General Education formula is proposed.

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Supplement 1
Comparison of Kansas and Texas
"Cost Adjusted Tier I Aid"

(Excerpt from research in progress)

COMPARISON OF COST ADJUSTMENTS IN KANSAS AND TEXAS

District need and student need adjustments can interact to significantly affect the distribution of school aid depending on the characteristics of the district and size of the adjustment. In this section we provide detailed descriptions of the scale adjustments and student need adjustments in Texas and Kansas school finance formulas. We then evaluate the balance between scale adjustments and student need adjustments by observing the relationship between "cost adjusted Tier 1 aid per pupil" and school district demographics including percentages of children in poverty and percentages of children expected to require English language remediation.

Both Kansas and Texas use two-tiered aid systems.[106] The first tier involves a foundation program where the state-set foundation level is adjusted to reflect cost differences across districts. The first tier in Kansas and Texas is partially supported by a mandated, uniform local property tax. The second tier involves a matching grant to support additional local property taxes particularly in low property wealth districts. Texas also adjusts a portion of the matching aid for cost differences. Our focus in this article is on the "cost adjusted base" for the first tier aid formula. The comparison of Texas and Kansas is valuable because both states make an effort to adjust for both pupil needs and economies of scale in their first tier aid program. Despite these similarities, these states provide an interesting contrast because of differences in the design and magnitudes of the scale adjustments versus student need adjustments.

A COMPARISON OF CONTEXTS

Table 4 contrasts the distribution of school districts and student populations in Kansas and Texas. Texas is obviously a much larger state than Kansas in terms of both geography and population. More interesting, however, are the differences in distribution of the population by rural and urban areas and enrollment size. Unlike Texas, Kansas has no major metropolitan areas, except for a predominantly suburban portion of the Kansas City, Missouri area. The largest school district in Kansas, Wichita, serves approximately 45,000 students. In Kansas, 32% of the state's students attend 6 large districts, three of which are relatively suburban (Olathe, Blue Valley, Shawnee Mission districts) and the other three more urban (Wichita, Topeka, Kansas City districts). Only 2 of Kansas' large districts (Topeka and Kansas City) have poverty rates exceeding 20%. Those two districts serve 7.4% of the state's student population. In contrast, 63% of Texas school children attend large districts, and 36% of Texas school children attend large districts with poverty rates exceeding 20%.

[106] Texas actually could be classified as a three-tiered system, because there is a wealth equalization provision as well, where districts with equalized wealth above $305,000 per pupil in weighted average daily attendance (WADA) (2002-2003) are subject to wealth reduction provisions.

TABLE 4
Comparison of District and Pupil Distributions in Kansas and Texas

	Kansas	Texas
Total pupils	450k	3.86m
Total districts	303	1,034
Districts < 1,000 pupils	212	559
Pupils (%) in districts < 1,000 pupils	94.5k (21%)	241k (6.3%)
Districts >10,000 pupils	6	80
Pupils (%) in districts > 10,000 pupils	145k (32%)	2.43m (63%)
Poverty percent in large districts	13%	28%
Large districts with poverty percent > 20%	2	42
Pupils (%) in large districts with poverty percent > 20%	33k (7.4%)	1.4m (36%)

Data Sources: Pupil and district counts in Kansas based on Kansas State Department of Education FY03 General Fund and Legal Max file. Similar data from Texas based on the Texas Education Agencies' FM02 files. Data on poverty rates accessed through the U.S. Census Bureau's, Census 2000, *School District Demographics* web site.

On the other end of the spectrum, over two-thirds of Kansas school districts enroll less than 1,000 pupils, while just over half of Texas districts enroll less than 1,000 pupils. In Kansas, 21% of children attend those districts, while in Texas only 6.3% attend small districts. The differences in population distributions set the stage for very different political dynamics in each state, arguably leading to differently balanced cost adjustments in state aid formulas.

SCALE ADJUSTMENTS IN TEXAS AND KANSAS

Texas Scale Adjustments

We begin with a description of the Texas small and midsized district adjustments. The Texas *Foundation School Program* (FSP) includes a series of cost adjustments intended to simultaneously accommodate costs associated with differences in district size, and sparsity. FSP also includes a separate block grant program for allocating transportation aid. As such, the sparsity adjustment to Tier 1 aid is assumed to be related to non-transportation operating costs. Very small districts (130 ADA or less) in Texas are effectively provided a "minimum base budget" by setting the funded pupils for those districts above the actual average daily attendance (ADA) using a set of decision rules based on grade levels offered and distance to the nearest high school district.[107]

[107] The decision rules for setting the fundable average daily attendance of very small districts are as follows: (1) if the district has less than 130 students in average daily attendance, offers a k-12 grade program and either enrolls at least 90 students or is greater than 30 miles by bus from the nearest high school, the district receives aid for 130 students; (2) if the district offers a k-8 program and has at least 50

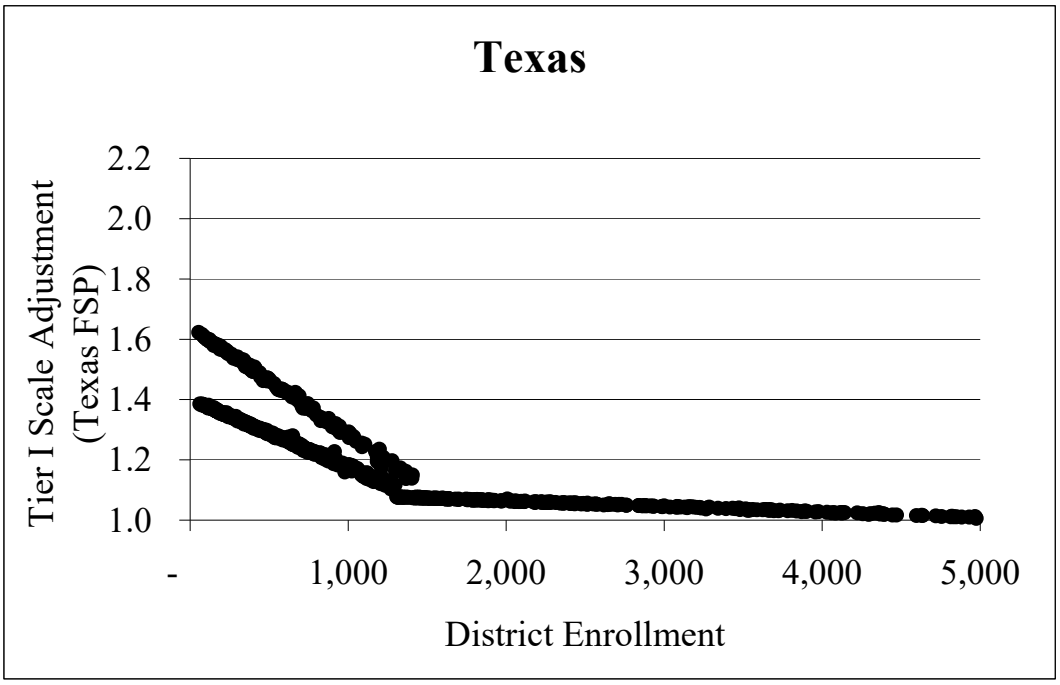
Small districts with 130 to 1,600 students receive either of two weights, a higher weight of .0004 if the district is greater than 300 square miles (thereby sparse) and a lower weight of .00025 if the district is less than 300 square miles. Districts with 1,600 to 5,000 pupils may receive midsized district weighted funding, with a weight of .000025. However, high property wealth districts are excluded from the midsized district weight.[108] In Texas, small and midsized district weights are applied to each district's "Adjusted Basic Allotment" (ABA). In 2002 – 2003, the basic allotment per pupil was $2,537. That basic allotment is multiplied times a "cost of education index," which adjusts for differences in teacher wages in different parts of the state, to yield the "Adjusted Basic Allotment." As such, the wage index and scale and sparsity adjustments have multiplicative effects.

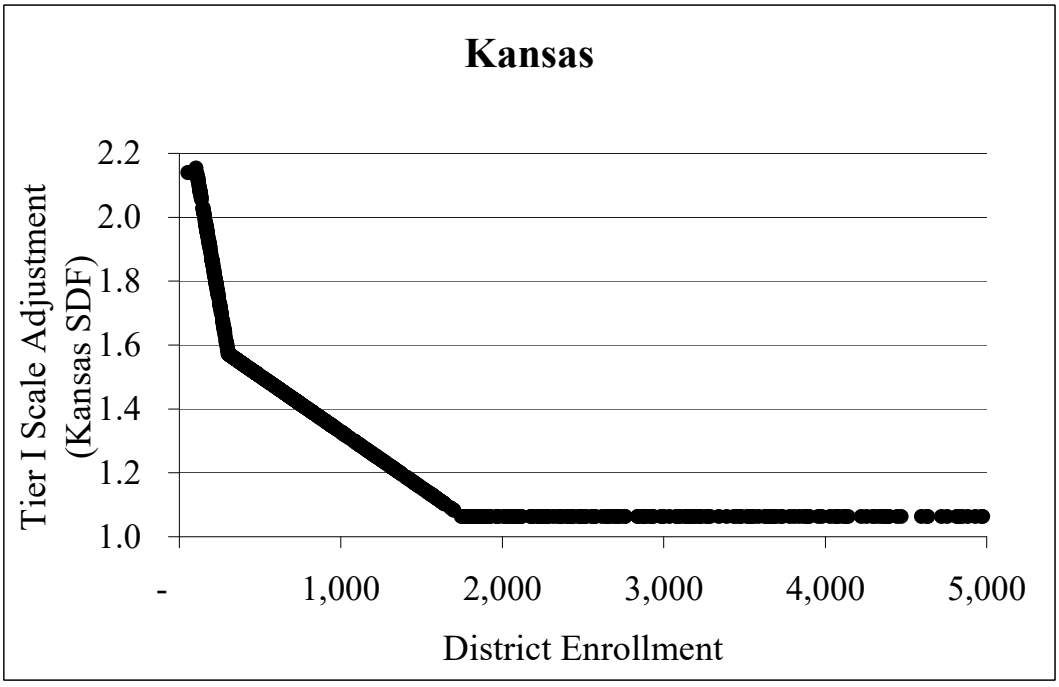
The end result of the Texas scale and sparsity index appears as Figure 1. The Y axis represents the magnitude of the adjustment, relative to the adjusted basic allotment. Districts may receive as much as 63% above (1.63) their adjusted basic allotment through small district weighting. For districts with fewer than 1600 pupils, there are two separately sloping lines. The steeper of the two lines represents the cost index for small, sparse districts over 300 square miles and the more gradual slope represents the index for small, less sparse districts. Districts with 1,600 to 5,000 pupils fall on the gradual sloping line that descends to 1.0.

students, or is 30 miles from the nearest high school district, the district receives aid for 75 students; or (3) if the district offers a k-6 program and has at least 40 students or is 30 miles by bus route from the nearest high school district, the district receives funding for 60 students.

[108] Districts with property values exceeding $305,000 per pupil in weighted average daily attendance (WADA) in 2002 – 2003.

FIGURE 1
Scale and Sparsity Adjustment





Kansas Scale Adjustments

In 1992, under court pressure (though no formal decree), the Kansas legislature adopted a new, cost adjusted two tiered formula called the *School District Finance Act* (SDF). As part of that formula, the legislature followed a Governors' task force recommendation that adjustments be made for economies of scale. The weight was calculated by taking the median general fund budget per pupil of districts with 75 to 125 pupils to represent the relative cost in districts with 100 pupils, the median budget per pupil of districts with 200 to 400 pupils to represent the cost in districts with 300 pupils and the median general fund budget per pupil in districts with over 1,900 pupils to represent the cost per pupil in districts with over 1,900 pupils.[109] A weighting scheme was derived by "connecting the dots" between the districts with 100 pupils, 300 pupils and 1,900 pupil to yield the pattern shown in Figure 2. Unlike the Texas' formula, no adjustments are made to the base prior to adjusting for scale.

These calculations resulted in ratios for Kansas of 214% for 100 or fewer pupils, 158% for 300 pupils, and no weight for districts with 1900 or more students.[110] Comparing Texas and Kansas in Figure 1, the smallest districts in Kansas receive a much higher weight. For districts with 300 to 1,000 pupils, the Kansas weight runs relatively parallel to the Texas weight for districts over 300 square miles, but the Kansas weight is significantly higher than the weight for non-sparse Texas districts.

OTHER COST ADJUSTMENTS TO FIRST TIER AID

Ultimately, the validity of a cost adjusted first tier of a funding formula is based not only on the effects of any single pupil weight, but on the aggregate effects of the pupil weighting system. It is important to note that for a number of reasons, pupil weights alone cannot directly be compared. The effects of weights on budgets per pupil depend on (a) how pupils in need are counted and (b) whether weights are applied to a uniform base aid allocation, or that allocation is first adjusted for other costs, creating multiplicative effects of weights.

Beginning with compensatory education, Kansas multiplies a weight of 0.10 by the number of students who qualify for free lunch. The weighted pupil count is then multiplied times the base aid per pupil, where that base aid is not adjusted for any other factors. As such, a child who qualifies for free lunch in Kansas yields .10 x 1 FTE x $3,863, or $386, regardless of district size. In Texas, children who receive either free or reduced lunch qualify for a 0.20 weight.[111] The weight is multiplied by the foundation level after adjustment for the state's "cost of education index," and after applying scale and sparsity adjustments. As a result, the dollar yield of the weight varies by district. Given that Texas applies a higher weight to a previously adjusted base, and has an overall

[109] Note that no separate adjustments or provisions were included for sparsity in the scale adjustment. Rather, a separate, density based formula is used for providing transportation aid.

[110] The SDFA was modified so that districts in 1999 with 1,725 students or more would receive a weight of 1.0632.

[111] Texas pupil counts are based on Average Daily Attendance (ADA) rather than a single day (September 20) enrollment count as in Kansas. Use of Average Daily Attendance as a count basis for compensatory funding may deflate numbers of qualifying students because children from economically deprived backgrounds attend school less regularly.

higher poverty rate, it is not surprising that compensatory/at risk weights make up 9.3% of the first tier level in the Texas formula, compared to only 2.1% for Kansas (Table 5).

TABLE 5
Comparison of Cost Adjustments in the First Tiers of Kansas *SDF* and Texas *FSP*

	Kansas		Texas	
	Percent of Total Tier I Aid Allocated to Cost Adjustment	**Implicit Pupil Weight**	**Percent of Total Tier I Aid Allocated to Cost Adjustment[c]**	**Implicit Pupil Weight**
Student Need Adjustments				
Compensatory/Poverty	2.1	0.16[a]	9.3	0.37[a]
Bilingual/Limited English Proficient	0.4	0.23[b]	1.1	0.24[b]
Vocational (KS)/ Career & Technology (TX)	1.3		5.3	
Gifted and Talented			0.5	
District Need Adjustments				
Geographic Costs/Wage Index			10.5 [7.9]	
Scale/Sparsity Adjustment	10.2		2.3 [2.7]	
Transportation	3.3		2.2	
New Facilities	1.6		0.2	
Sum of Student Need Related (Bilingual, Compensatory, Vocational)	3.8		15.7	
Sum of District Need Related (Scale, Transportation, Geographic Cost)	15.1		11.18 [12.98]	

[a] Based on rates of poverty reported in U.S. Census 2000, for children aged 5 to 17.
[b] Based on U.S. Census Bureau, number of children between ages of 5 and 17 who speak English "Not Well" or "Not at All".
[c] Percentages calculated after excluding special education aid from Teir 1 of FSP, yielding total cost of Tier I of about $12.7 billion. Values in brackets include multiplicative effects.

As with compensatory/at risk weights, both the magnitude and the application of bilingual education weights differ in Kansas and Texas. First, Kansas uses a weight of 0.20 and Texas a weight of 0.10. In Kansas, bilingual pupil counts are based program contact hours, where it takes 6 contact hours (full time) to yield 1 FTE pupil. In Texas bilingual counts are based on ADA counts for students qualified for bilingual education. Unless children are receiving bilingual programming full time in Kansas, or unless qualified children in Texas attend school at a very low rate, the Kansas approach will likely result in significantly fewer funded pupils.[112]

In general, student need and program based weights, including compensatory, bilingual and vocational education make up a larger share of the "cost adjusted first tier" in Texas than in Kansas (Table 5). In Kansas district need weights like transportation weighting and economies of scale adjustments are larger than those in Texas. A notable exception is Texas' use of a geographic cost index for adjusting teacher wages. The

[112] For example, in 2000 Kansas City, Kansas, a large relatively urban, impoverished district, reported 1,938 limited English proficient pupils (in the NCES Local Education Agency Universe Survey) they reported 6,897 contact hours (for Kansas General Fund Calculation purposes). Dividing the contact hours by 6 yields 1,149 fundable FTE pupils, or 59% of the LEP count. For Wichita, the states largest district, that figure was 71%. It may also be relevant to note that numbers of pupil identified by local districts may be sensitive to available aid levels. As such, there may be less incentive for Kansas districts to seek bilingual education aid.

overall effect of this index is to shift money back toward the state's major metropolitan areas, as well as economically depressed cities in southern Texas along the Rio Grande.[113] Because the Geographic Cost index benefits larger cities and towns, it partially offsets the effects of the scale component. In Kansas, the scale component alone makes up 10.2% of Tier 1 costs, while in Texas the scale component alone makes up less than 3%.[114]

Table 5 provides implicit weights derived from each state's Tier I cost adjustments. In Kansas, for example, the 0.10 poverty weight yields $778 per child in poverty.[115] Relative to average Tier I aid per pupil, the implicit poverty weight for Kansas is 0.16. In Texas the poverty weights yield $1,329 per child in poverty, on average, producing an implicit weight of 0.37. For LEP children implicit weights are 0.23 for Kansas and 0.24 for Texas. [116]

EVALUATING THE AGGREGATE EFFECTS OF COST ADJUSTMENTS

In this section, we compare the distribution of cost adjusted first tier aid in Texas and Kansas by district size, and by indicators of student need, including percentages of children in poverty and percentages of children with limited English language proficiency. We construct comparable "cost adjusted first tier aid" values by excluding from Kansas transportation aid (allocated separately in Texas), and from Texas special education weighted aid (allocated through a separate formula in Kansas).

Figure 2 compares the first tier aid per pupil for small districts in Kansas and Texas (<5000). On the vertical axis of each chart, the first tier aid per pupil has been expressed as a ratio to the base aid per pupil used in each state's foundation formula in 2002-03 (Kansas = $3,863, Texas = $2,537). As such, the vertical axis indicates the "aggregate Tier I cost index" for each district. Note that in Kansas, among small districts, there is little variation in first tier funding aside from the scale weight. The minimal scattering of points above the linear segments for scale implies that Kansas' small districts receive little additional funding for at risk children or bilingual or vocational education programs. In Texas, there is somewhat more variance in district funding for each enrollment, because both district size and distance is considered in determining the weight. In addition, differences in percentages of children in poverty, technical education or bilingual education programs may account for some variation.

[113] Roma, Brownsville, Rio Grande City

[114] The 2.3% figure for the Texas scale component cost is based on the influence of the scale weight alone on costs for regular education students. This figure excludes the multiplicative effects of the scale weight times the cost of education index and the effects of the scale weight on student need weights including special education, compensatory education and bilingual education weights which are multiplied times scale and cost adjusted aid. Excluding special education, but including multiplicative effects with geographic cost index, our estimate increases to 2.7%.

[115] Based on U.S. Census Bureau estimates of the population from 5 to 17 in poverty

[116] Based on U.S. Census Bureau estimates of the population from 5 to 17 that speaks English "Not Well" or "Not at All"

FIGURE 2
Aggregate Effects of Tier 1 Cost Adjustment
on Small (<5,000) Districts

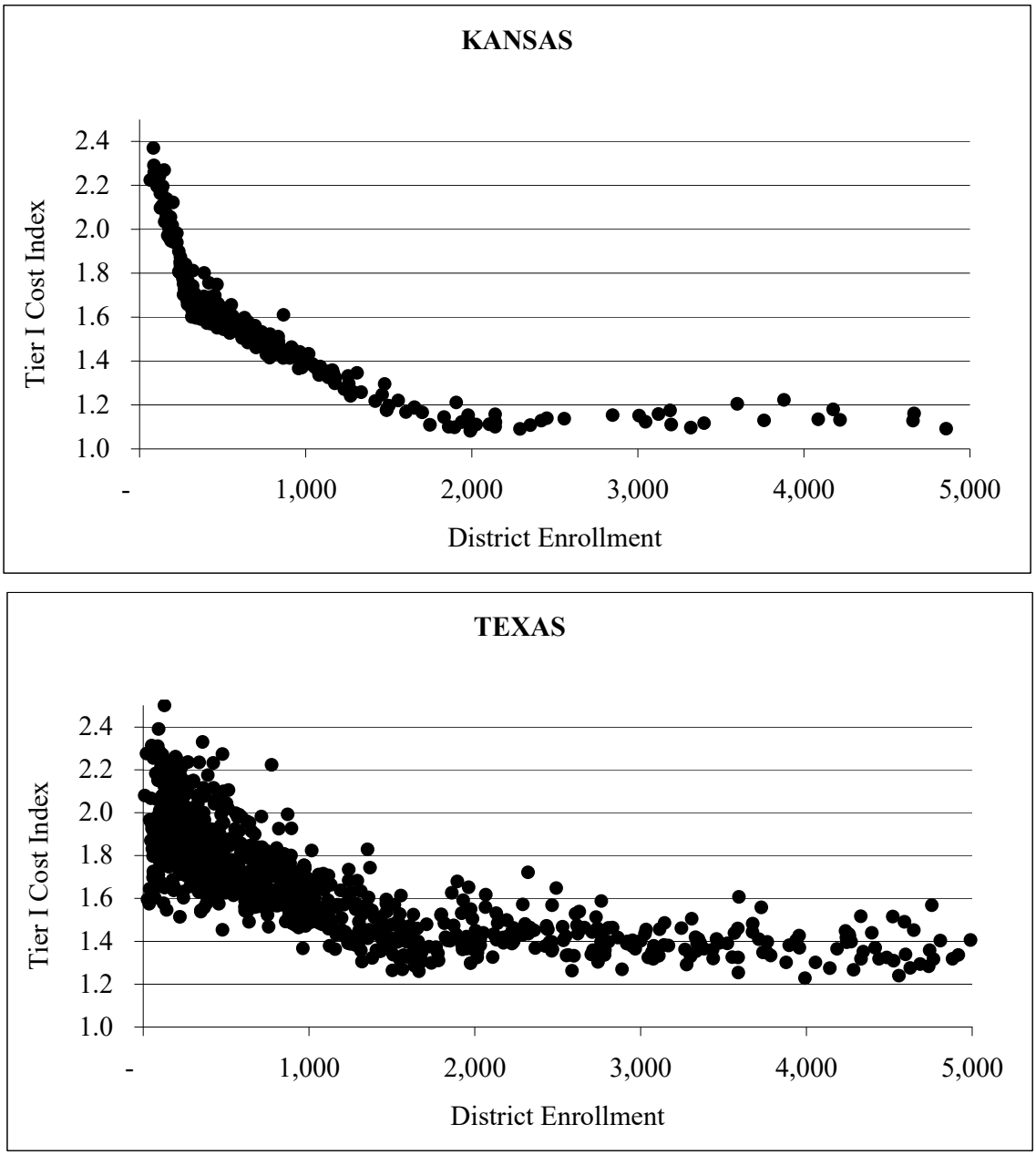
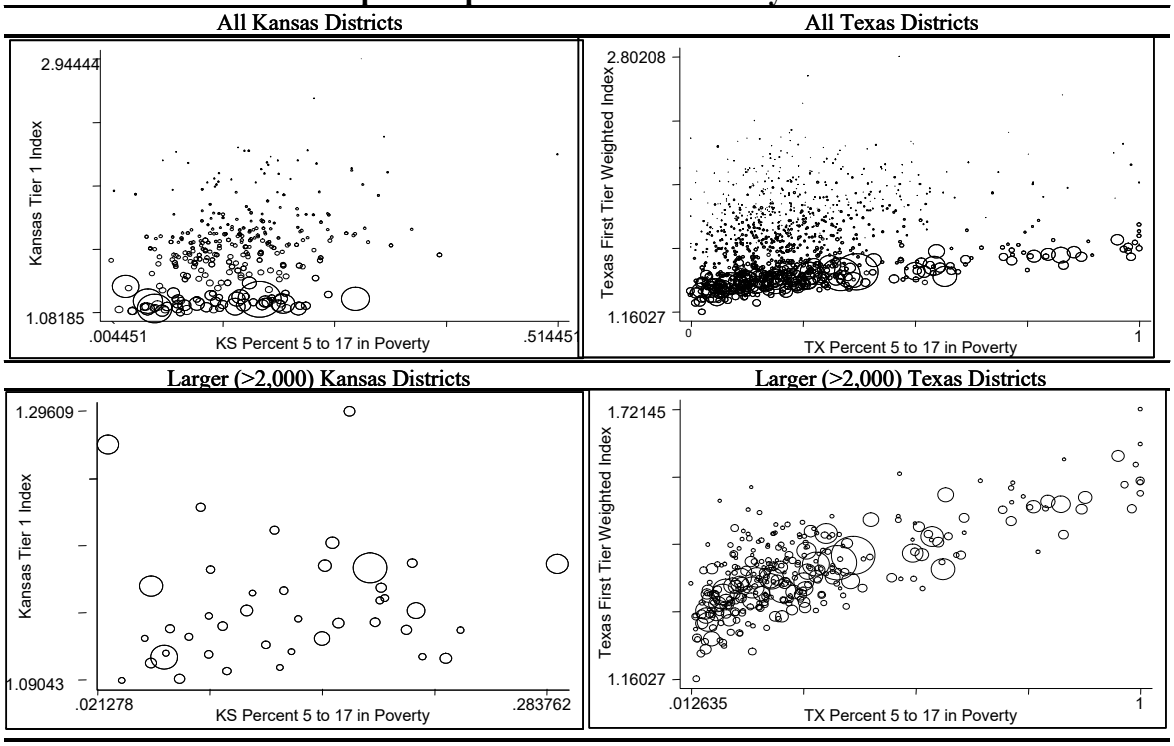


Figure 3 displays the relationships between the aggregate first tier cost index for both the Kansas and Texas formulas, and the percent of children living in poverty. [117] The

[117] Because school districts in each state count children in need in different ways, and because district level identification rates may be endogenous to cost adjustments, we rely on U.S. Census Bureau data to measure the characteristics of the populations of school aged children aligned with school district boundaries. In particular, we use the U.S. Census Bureau's measures of the numbers of children between the ages of 5 and

top two panels of the figure include all districts in each state, and the bottom two panels include only the state's larger districts, or those not receiving significant economies of scale adjustment. The size of the bubbles in each graph represents the relative sizes of districts in each state. Note, however that a large bubble in Kansas, is a district with 30,000 to 45,000 pupils, while the largest bubbles in Texas have over 150,000 students. If first tier funding accounted significantly for high student needs, in this case poverty, we would expect to see a positive relationship for all districts, and for any subset of districts.

FIGURE 3
Graphic Representation of Poverty Effects



Source: Kansas Tier I index based on FY 2002 – 03 General Fund Budgets (less transportation aid), using FY03 General Fund and Legal Max file (www.ksde.org) and Texas Tier I index based on 2002 – 03 Tier I aid (less special education aid) using the Texas Education Agency's FM02 files and a simulation constructed by the authors. Poverty rates from Census 2000 special tabulation.

Examining first the pattern for Kansas, there is a positive relationship between Tier I aid and poverty rates for all districts, which is confirmed in Table 6 by the positive, statistically significant regression coefficient (pupil weighted) The positive relationship is accounted for primarily by the high poverty rates among a number of small districts, which receive larger scale adjustments. Among medium-sized and larger Kansas districts

17 living in poverty, divided by the population of children between 5 and 17 for each Kansas and Texas school district to yield the district's percent of children in poverty.

(over 2,000 students), however, there is no discernable pattern between poverty and the aggregate Tier I index.[118]

TABLE 6
Estimates of Poverty and Language Proficiency Status Effects for Kansas and Texas Tier I Aid

	Kansas			Texas		
	Estimate	Sig.	Rsq	Estimate	Sig.	Rsq
Effects of Scale Index Alone on Student Need						
Scale Index and Poverty	0.40	**	0.02	-0.01		0.00
Scale Index and LEP	-2.69	**	0.04	-0.52	***	0.05
Effects of Texas Geographic Wage Index						
Wage Index and Poverty				0.07	***	0.13
Wage Index and LEP				0.61	***	0.34
Effects of Tier I Index (comparable components) on Student Need						
Tier I Index and Poverty						
All Districts	0.47	***	0.01	0.26	***	0.19
Large (>2,000) Districts	0.03		0.00	0.28	***	0.65
Texas Large Districts Limited to KS Range (<28.4%)				0.36	***	0.25
Tier I Index and LEP						
All Districts	-1.63	**	0.02	0.79	***	0.05
Large (>2,000) Districts	1.01	**	0.12	1.39	***	0.48
Texas Large Districts Limited to KS Range (<7.8%)				1.56	***	0.28

**Statistically significant from zero at 5 percent level. ***Statistically significant at the 1 percent level.

[a] Adjusted R-squared of regression of Tier I index on enrollment, enrollment squared, poverty and LEP shares.

Texas contrasts with Kansas when evaluating poverty effects. It is important to note that the range of poverty in medium sized and larger districts is much wider in Texas, with districts having as high as 100% of children in poverty compared to a maximum of 28% poverty rate in medium sized and large Kansas districts. Table 6 and Figure 3 indicate that across all districts, the magnitude of the poverty effect is larger for Kansas than for Texas, though the relationship between poverty and funding is stronger in Texas (higher R-squared). While Kansas shows no discernable poverty effect for large districts, Texas shows a positive poverty effect for large districts, which explains a substantial portion (65%) of the variance in first tier funding. The poverty effect for Texas large districts increases when restricted to the poverty range of Kansas large districts. Unlike Kansas, the Texas scale weight is not positively associated with poverty.

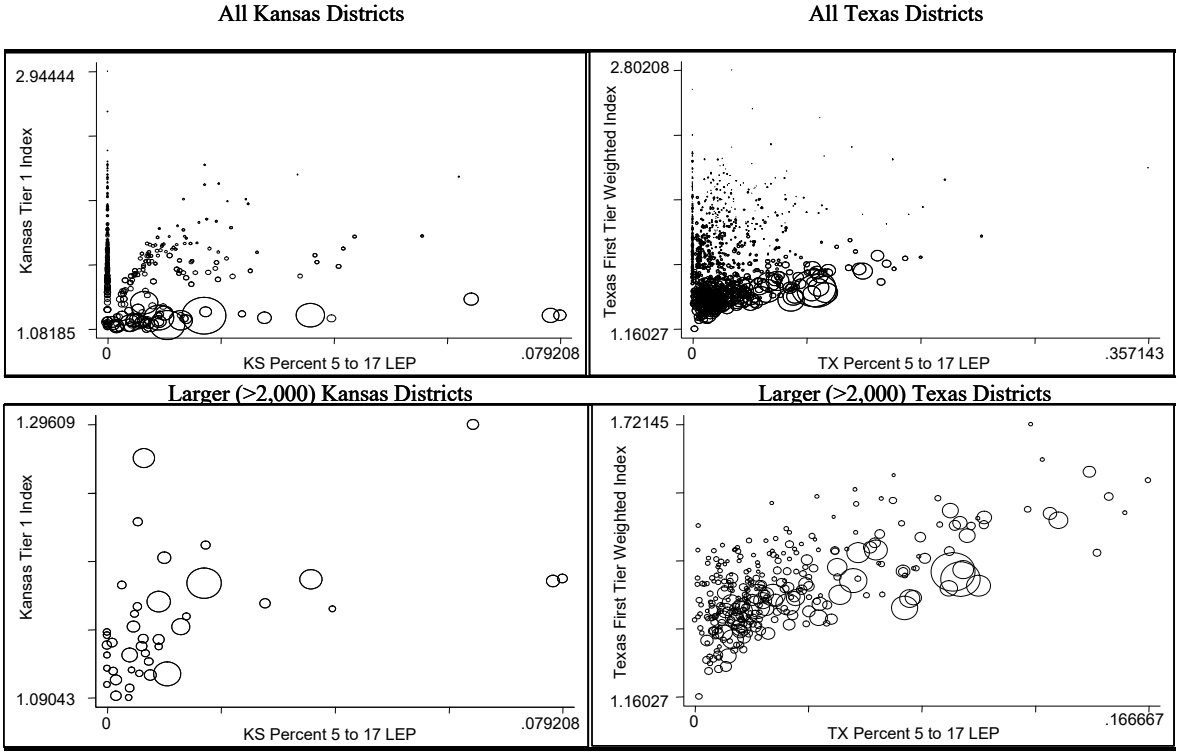
Figure 4 presents the relationship between the first tier cost index and shares of limited English proficient children.[119] When considering districts of all sizes in Kansas, there does not appear to be a strong relationship between the Tier 1 index and LEP shares. In Table 6, the statistical estimate of the relationship between LEP students and the first tier index is negative, but the LEP shares explain little of the variation in tier 1 funding levels. The negative relationship can be accounted for by the higher percentages

[118] The lack of positive relationship is due in part to some large, very low poverty districts in Kansas that receive much higher aggregate cost adjustment than high poverty districts. These fast growing wealthy suburbs like Blue Valley, receive substantial additional weighting via "new facilities" and "ancillary new facilities" adjustments. In 2002 – 2003, Blue Valley received an overall implied cost adjustment of 1.29, while Kansas City, the state's poorest urban district received only 1.20.

[119] Like poverty status, and with the same rationale, for LEP status we use U.S. Census Bureau's measure of the number of children between 5 and 17 who speak English "Not Well" or "Not at All," as a percent of each district's population between the ages of 5 and 17.

of LEP children among some of the state's larger districts that receive no scale adjustment and few or no LEP children in many of the state's small districts. Focusing on larger districts in Kansas, a positive LEP effect emerges, yet outliers (high cost adjustment, low LEP share) persist, reducing the variance in Tier I cost adjustments explained by LEP share. A handful of districts, serving higher percentages of LEP pupils appear to benefit from the bilingual programming weight.

FIGURE 4
Graphic Representation of LEP Effects



Source: Kansas Tier I index based on FY 2002 – 03 General Fund Budgets (less transportation aid), using FY03 General Fund and Legal Max file (www.ksde.org) and Texas Tier I index based on 2002 – 03 Tier I aid (less special education aid) using the Texas Education Agency's FM02 files and a simulation constructed by the authors. Language proficiency rates from Census 2000 special tabulation.

When observing all Texas districts, we find a positive relationship between LEP shares and the aggregate Tier I cost index. However, the fit of the model is weak because a number of small districts have very low LEP shares, but high Tier I cost indices due to scale adjustments. While the Texas scale weight, like the Kansas scale weight is negatively associated with LEP shares, the Texas geographic wage index is positively associated with LEP shares, in part because cities in the Southern tip of the state, along the Rio Grande, receive the largest geographic cost adjustments. Focusing on larger districts in Texas, the positive LEP effect is stronger, especially when restricting the LEP share range for Texas districts to that of Kansas. For larger districts, there are fewer outliers. As a result, the LEP share variable explains between 28% and 48% of the variation in the aggregate Tier I cost index.

Summary of the Relative Balance in Kansas and Texas Tier I Aid

Overall, Kansas provides greater support for small rural districts, and less for larger more ethnically and socio-economically diverse towns and urban centers. In Texas, the balance of cost adjustments tilts somewhat in the other direction, providing less support for small rural districts and more for urban centers. The collective effects do not differ as a simple function of Texas having a smaller scale weight and Kansas having smaller compensatory and bilingual program adjustments. Rather, a number factors play indirectly into the overall distribution. For example, Kansas provides substantial support for high poverty rural districts, not through compensatory aid, but through its scale adjustment. Texas provides substantial support for cities and large towns with very high LEP populations, not through its bilingual programming weight, which is relatively small, but through its geographic cost of education index.

Not surprisingly, the balance of winners and losers that emerge from each state's system of cost adjustments roughly reflects the balance of the distribution of the population presented back in Table 4. One might translate the population balance to political balance in state legislatures. In Kansas, larger districts, in particular large high poverty districts lack the critical mass to shift school finance policy in their favor. Recall that only 7.4% of Kansas children attend large districts with poverty rates over 20%. In contrast, 36% of Texas school children attend large high poverty districts. In Kansas, recall that 21% of Kansas school children attended rural districts with fewer than 1,000 pupils, while in Texas only 6.3% of children attended such districts. Clearly, political balance plays a significant role in determining the balance of cost adjustments.

Note

This additional figure, not included in the final version of the work cited in this supplement, compares the Kansas scale weight to the present Texas scale weight, and to the scale weight estimated by researchers for the 77th Texas legislature. The cost function scale weight is the same scale weight that underlies the cost function indices used in Section I of this report in which I present a framework and examples for a "cost adjusted two tiered" formula. Note that for Texas districts the present scale adjustments in many cases are too large. For example, the green curve crosses the higher blue line (for sparse small Texas districts) at a district enrollment of about 140 pupils and the lower blue line (for non-sparse Texas districts) at 270 pupils. In Kansas, all non-sparse and sparse small districts between 1725 and 100 pupils receive more in cost adjustment than sparse Texas districts, which, except for those with fewer than 140 pupils, receive too much.