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ABSTRACT

This paper explores the impact of the Kentucky Education Reform Act (KERA) of 1990 on the funding and allocation of resources to special education. Overall, the results indicate that the revenues generated for the special education system by KERA are approximately equal to marginal costs of special education services statewide. However, there is significant district-to-district variation in special education expenditures relative to revenues generated by KERA. Moreover, these patterns are related to student poverty, identification rates, and per capita income. While the overall funds generated have approximated costs by special education funding category, there is substantial variation in costs within funding categories that affect the equity of the system. However, district special education directors appear to favor the new system over the old system because of the increased flexibility for serving children, the reduced costs of fiscal audits, and the reduced incentives for placement. Individual chapters describe the Support Education Excellence in Kentucky (SEEK) Program, the study methodology, empirical results, policy implications of cost analysis, and perspectives on the special education funding system from sample local directors of special education. Appendices provide an explanation of the SEEK formula and estimated figures for tuition costs for out-of-district placements. (Contains 20 references.) (Author/DB)

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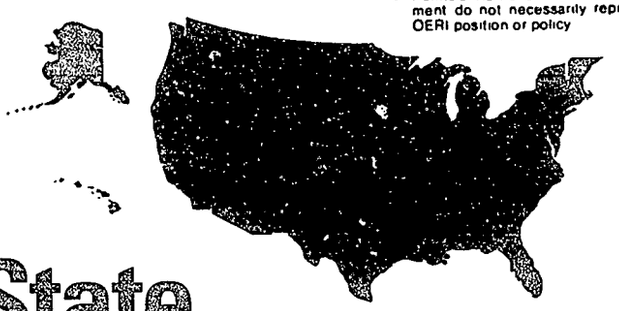

State Analysis Series

Impact of the Kentucky Education Reform Act on Special Education Costs and Funding

Jay G. Chambers
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March 1995

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Abstract

This paper explores the impact of the Kentucky Education Reform Act (KERA) of 1990 on the funding and allocation of resources to special education. Overall, the results indicate that the revenues generated for the special education system by KERA are approximately equal to marginal costs of special education services statewide. However, there is significant district-to-district variation in special education expenditures relative to revenues generated by KERA. Moreover, these patterns are related to student poverty, identification rates, and per capita income. While the overall funds generated approximate costs by special education funding category, there is substantial variation in cost within funding categories that affect the equity of the system. However, district special education directors appeared to favor the new system over the old system because of the increased flexibility for serving children, the reduced costs of fiscal audits, and the reduced incentives for placement.

I. Background and Purpose

In 1989, the Kentucky Supreme Court declared that the state's public elementary and secondary educational system was unconstitutional. The state's educational system was characterized as providing an inequitable and inadequate level of resources for serving all children in the state. In response to this declaration, the General Assembly enacted House Bill 940, also known as the Kentucky Education Reform Act (KERA), in 1990. This reform bill called for a systemwide change in education that focused on areas of curriculum, governance, and finance.

As a result of House Bill 940, the General Assembly entirely changed the general school finance structure because it had "...no alternative but to increase overall funding as well as to eliminate disparities in revenues among school districts" (Executive Editor, 1989, p. 134). As an integral part of general school finance reform, the funding mechanism for special education changed from a unit-based formula to a pupil weighting system. The Kentucky State Legislature mandated this study to review the existing approach to special education funding and to provide information to the Kentucky State Board of Education that would help them develop recommendations for making any necessary revisions to the funding mechanism for special education.

The new school funding system implemented under KERA is basically a foundation type program which establishes a basic allocation for each child being served. Each district's basic allocation is adjusted by a series of pupil weights to reflect the added cost of serving certain special student populations including exceptional students (i.e., special education), at-risk students, and students receiving home and hospital services. Thus, funding for these various populations is integrated into the general school finance formula. Of particular interest is the fact that funds generated by the exceptional child add-on are not

targeted to special education students. While districts still must adhere to federal requirements, there are no restrictions against special education teachers working with students without disabilities in regular classroom settings. Given these circumstances, the State Board was interested in determining whether revenues being generated by special education students are being spent on these students.

This study addresses three major cost questions:

- *How do statewide expenditures compare with the revenues generated for special education services? Is special education adequately funded in the state?*

- *How do special education expenditures compare with revenues in individual districts or types of districts? Which types of districts exhibit systematic differences in the relationship between expenditures and revenues for special education?*

- *How do the three pupil weights currently in use under KERA compare with the actual costs of serving the various categories of students?*

The results of this study show that for the state as a whole, expenditures on special education are approximately equal to revenues. However, there is a considerable range of variation across individual districts in the extent to which expenditures match revenues. Finally, on average, revenues generated by the KERA weights approximate the cost of services, but there is a considerable variation within the categories of students covered by each of the three pupil weights currently being used. These results are based on analysis of statewide databases in combination with data collected from a stratified random sample of districts within the State of Kentucky for the 1993-94 school year.

This paper includes a description of the new funding system that was implemented as part of KERA, an overview of the study methodology, the results of the empirical analysis, a discussion of the policy implications, and a summary and concluding remarks.

II. Support Education Excellence in Kentucky (SEEK) Program

Three-tiered System

House Bill 940 called for public education in Kentucky to be funded through a new school finance system known as the Support Education Excellence in Kentucky (SEEK) Program. SEEK, a tiered finance system, is composed of three distinct, but closely related components: Adjusted Base Guarantee, Tier I, and Tier II. This type of finance system is considered to be a shared finance system. It establishes a guaranteed amount of aid per pupil and uses a measure of district wealth or fiscal capacity to adjust state aid allocations in inverse proportion to the district's ability to pay (O'Reilly, 1993). Through Tiers I and II, the formula allows for "local leeway," which allows districts to tax themselves above the mandated tax rate.

State Adjusted Base Guarantee

SEEK is essentially a foundation program where the state provides a guaranteed amount of revenue per pupil (i.e., base) to each school district. Biennially the General Assembly derives a statewide guaranteed base funding level usually on the basis of available funds. The base amount for the 1993-94 school year was $2,495 per pupil.

The base funding level for each school district is also adjusted using a series of add-ons which reflect the additional costs for at-risk students using a pupil weight of .15; home and hospital which includes an additional $2,395 per pupil served; and exceptional children using three weights applied to unduplicated

counts of low incidence, high incidence, and speech and language-only students. An add-on is also provided for transportation services.

SEEK also requires a minimum level of effort from local school districts. Each school district is mandated to levy a minimum equivalent tax rate of 30 cents per $100 of assessed property value. The Required Local Effort (RLE), the local contribution to the adjusted base guarantee, can be reached by levies on property and through other levies permitted for general school purposes (e.g., motor vehicle tax, utility tax). The difference between the RLE and the calculated base (i.e., base plus the four add-ons) represents the state SEEK contribution to a local school district. As a result, state aid will vary across districts, and this variance ensures that state aid to districts is sensitive to local fiscal capacity due to variations in local property wealth (Adams, 1993).

Tier I

Tier I is an optional component of SEEK that allows school districts to raise additional revenue of up to 15 percent of the adjusted base guarantee. If a school district chooses to levy this additional tax and its per pupil property wealth is below 150 percent of the statewide average for per pupil property wealth, the district receives state equalization funds. State equalization funds are provided in order to guarantee that each participating district will receive that same revenue per pupil when making the same tax effort. If a local board chooses to levy a tax rate under this tier, the levy is not subject to an electoral vote with a few exceptions.

Tier II

Tier II is another optional component of SEEK that allows school districts to raise additional revenue of up to 30 percent of the amount generated by the adjusted base guarantee and Tier I. Tier II differs from Tier I in that the district does not receive state equalization funds and the tax rate levy is subject to an electoral vote. As noted in the Exceptional Child Pupil Weight Status Report (1993), "Tier II has the effect of placing a cap on the amount of revenue a local school district can raise, thereby maintaining some control over the disparity in per pupil revenues that might be available in local school districts" (Kentucky Department of Education, 1993, p. 50).

A detailed description of the SEEK formula is presented in Appendix A to this paper.

Exceptional Child Add-On

Funding for the exceptional children program has been an integral part of the general education finance system. However prior to SEEK, state aid for special education was administered on the basis of classroom units, which provided a fixed amount of money to cover the cost of the resources needed to operate each classroom unit. Under SEEK, state aid for special education is calculated through a pupil-weighted formula. Students with disabilities aged 5 through 21 generate an exceptional child add-on based on categories of disability. The federal disability categories plus an additional category for developmentally delayed (for pre-school children) are grouped into the following three categories with the corresponding pupil weights for the 1993-94 school year.

Category	Pupil Weight
Low Incidence Category: Functional Mental Disability, Emotional Behavioral Disorder, Deaf-Blindness, Hearing Impairments, Multiple Disabilities, Visual Impairment, Autism, and Traumatic Brain Injury	2.34
High Incidence Category: Specific Learning Disability, Mild Mental Disability, Other Health Impairment, Orthopedic/Physical Disability, Developmentally Delayed	1.17
Speech or Language Impairment Only Category	0.24

This total count from the three pupil weight categories is then multiplied by the base amount awarded for Average Daily Attendance (ADA) to get the district's total exceptional child add-on. The following formula demonstrates how the total district exceptional child add-on is calculated.

District's Total Exceptional Child Add-on (TE) for 1993-94:

$$TE = (NL \times 2.34 \times \$2,495) + (NH \times 1.17 \times \$2,495) + (NS \times 0.24 \times \$2,495)$$

where $2,495 equals per pupil base allocation and the unduplicated special education child counts for the previous year are represented by

NL = for the Low Incidence Category
NH = for the High Incidence Category
NS = for Speech or Language Impairment Only Category

This add-on is intended to reflect the additional costs over and above the base allocation associated with each special education child. Each special education child also generates the same base level of funding of $2,495 as all other students served by a district.[1]

Some of the important features under the current special education funding system are the following:

- The exceptional child add-on is based on the previous year's federal child count for children served within a given district.

- Funds generated by the exceptional child add-on are *not* targeted to special education students. All dollars are allocated to all students under SEEK with the requirements that needed services must be provided. Districts still must adhere to federal requirements which specify that (1) districts must spend in the current school year at least as much as they spent in the previous school year for providing services to children with disabilities, (2) districts must spend at least as much on every student with disabilities as on a student without disabilities, and (3) districts must not use federal dollars to pay for a program or service previously paid for or mandated by the state.

- The exceptional child add-on has no relationship to existing state class size standards for special education students. However, current state regulations still apply regarding maximum allowable class sizes for special education.

- The exceptional child add-on does not place a restriction on special education teachers working with students without disabilities in a regular classroom or collaborative (inclusive) setting.[2]

[1]For example, each low incidence student generates an add-on of $5,838.30 (=2.34 x $2,495) and a base allocation of $2,495 for a total allocation of $8,333,30 (=$5,838.30 + $2,495).

[2]Kentucky uses the word collaborative teaching to refer to arrangements that are more commonly referred to as "*inclusive practices*," i.e., the practice of working with special education children within the regular classroom environment.

III. Study Methodology[3]

Although much of the data for this study came from statewide databases provided to CSEF and were available for all 176 districts within the state, no data were available statewide for a number of data elements. These data elements were estimated based on data collected specifically for this study from a stratified random sample of 17 districts and 63 schools. The districts were stratified by size and special education identification rates and were selected with probability proportional to total enrollment (i.e., larger districts had a greater chance of being selected). Five of the districts in the original sample did not wish to participate in the study. Therefore, a replacement sample was chosen using the same sampling strategy. Replacement districts were selected at random from the same stratum as the district choosing not to participate.

A sample of schools within each district was also selected. For each district in the sample, a minimum of two elementary, one middle, and one high school were selected. If the district contained special schools, at least one of these schools was selected. Table 1 displays the district and school sample.

The primary statewide databases used for the analysis in this paper were the *School Data Form (SDF)*, *Professional Staff Data (PSD)*, the December 1 Special Education Child Count, and 1993/94 SEEK Calculations from the Kentucky Department of Education.

The second phase of data collection involved telephone contacts with the 17 sample districts followed by a series of requests mailed to designated district and

[3]Readers interested in a more detailed description of the sample selection, data collection, and analytical procedures used for this study may request the full report entitled *"Special Education Weight Project for the State of Kentucky"* from the Center for Special Education Finance located at the American Institutes for Research in Palo Alto, California. Copies of the data collection instruments are included in Appendices to the complete report.

school staff for hard copy reports and computerized data files containing specific fiscal, student, staffing, or programmatic data. Among the request for materials from school principals, CSEF staff asked for staff rosters including all school personnel working in each building. Follow-up phone calls were made by CSEF staff to clarify and interpret the information that was provided and to ensure that the analysis was as comprehensive as possible. Sufficient materials were received from all 17 districts to carry out the cost analysis for this study. CSEF staff used the materials to complete a series of forms which described the patterns of resource allocation and utilization within the sample schools and for the special education district administration and support services.

Table 1
Description of district and school sample

	Number of				
	Districts	Elementary Schools	Middle/Junior High Schools	High Schools	Special Schools
Largest strata	3	6	5	3	2
Large strata	3	6	3	3	0
Small strata	7	13	5	7	0
Smallest strata	2	2	1	3	0
High incidence strata	2	2	0	2	0
Total	17	29	14	18	2

Largest strata represent districts with public school enrollment > 10,000 students with special education identification rates ≤16%.
Large stata represent districts with public school enrollment between 5,001-10,000 students with special education identification rates ≤ 16%.
Small strata represent districts with public school enrollment between 1,000-5,000 students with special education identification rates ≤16%.
Smallest strata represent districts with public school enrollment <1,000 students with special education identification rates ≤16%.
High incidence strata represent districts with public school enrollment <5,000 students with special education identification rates >16%.

In addition, a 20 percent sample of special education students up to a maximum of four students was selected from the caseloads and classes of each special education teacher assigned to one of the sample schools. The special education teacher was asked to complete a *Special Education Student Information Form* in order to gather information on all the services a student receives and the number and type of school staff providing these services. A total of 718 *Student*

Information Forms were sent out to teachers and 536 usable responses were received for a response rate of 75 percent.

A *Special Education Director Interview* was also administered by CSEF staff to gather qualitative information on the state special education finance system from the 17 special education directors in the sample. The interview protocol was used to gather information over the telephone on how well the state finance system for special education works with specific questions regarding the major areas of concern in funding special education, disincentives and incentives associated with the funding system, whether the funding system meets their needs, how the funding system impacted regular education, and how the funding system can be improved.

IV. Empirical Results

Through the course of this project, CSEF staff have met twice with the Project Steering Committee in the Kentucky special education community. The purpose of these meetings was to establish a clear understanding of the goals for special education finance reform in Kentucky and to provide assistance in identifying the information that would be helpful to the state in considering potential modifications to the system. Indeed the major cost questions posed at the beginning of this paper were identified as a result of these meetings.

The analysis focuses attention on the costs of personnel services for special education students. It is well known that education is a labor intensive industry and that, on average, the costs of personnel account for more than 85 percent of total educational expenditures. For instructional services, this percentage is generally even higher. Moreover, data on the costs of furnishings and equipment, as well as other components of nonpersonnel costs, are generally not easily accessible.

The *Professional Staff Data (PSD)* system maintained by the Kentucky Department of Education represents a primary source of data used to determine the level of expenditures on special education services in Kentucky. This data source contains valuable information on the detailed assignments of all certificated personnel employed in the schools within the Kentucky public school system. Certificated personnel are to report their type of assignment by using one or more of the 500 assignment codes listed on the PSD form. For each assignment code, professional staff are required to list time allocations, numbers of students served, and levels of pay.

Through the assignment descriptions and the account/fund codes associated with each assignment record contained in the PSD file, CSEF staff, with the help

of Kentucky Department of Education staff, identified all of those assignment codes which represent professional staff who are providing instructional, administrative, or support services to special education students. The personnel costs associated with each assignment are calculated from the payroll information contained in each PSD record. Assignments are sorted and organized according to whether they are part of regular or special education; and they are divided among various instructional, administrative, and support costs. Instructional costs are divided among resource programs (pull-out) programs, special class programs, collaborative teaching, planning and travel, preschool, home and hospital, and vocational programs.

While the PSD does report comprehensive information on the universe of certificated personnel, no such data are available for noncertificated personnel in a form that allows determination of how these noncertificated personnel divided their time among regular versus special education. For this reason, it was necessary to collect data on noncertificated personnel working at the sample districts and schools described earlier under study methodology. Using the observed relationship between certificated and noncertificated personnel expenditures in the sample schools, the levels of non-certificated personnel expenditures are estimated in all of the schools and districts in the state.[4]

A Comparison of Statewide Revenues and Expenditures for Special Education

How do statewide expenditures compare with the revenues generated for special education services? Is special education adequately funded in the state?

Table 2 presents a comparison of the statewide total revenues and expenditures for special education services for the 1993-94 school year. Special education students in Kentucky public schools generated a special education *add-on* of

[4]A regression equation estimated from data on the sample schools was used to predict the level of noncertificated personnel expenditures in each school throughout the state. Expenditures on noncertificated salaries and benefits for district-level administrative and support functions were also estimated from the sample districts and applied to all districts in the state. Details of these estimation procedures may be found in the complete report referred to earlier. The costs to local districts of personnel benefits are also estimated. For certificated personnel, districts assume responsibility for paying only the basic payroll taxes (e.g., liability insurance, Medicare, worker's compensation). Thus, district benefit contributions for certificated personnel amount to about *three* percent of salaries. The state pays for the remaining benefit costs for certificated personnel including retirement, health, and life insurance premiums. For noncertificated personnel, the district contributes about 18 percent of salaries to benefits which includes social security, retirement, worker's compensation, and Medicare. The personnel cost figures presented in the following section generally include the district contributions to benefits unless otherwise indicated.

$184.0 million using the foundation formula and pupil weights specified under KERA. Because of the way in which the SEEK formula operates, a portion of these funds will come from the state with the balance coming from local sources depending upon the wealth of each individual district. Federal funding of special education services amounted to a total of $34.8 million. With 73,669 special education students served, these revenues amounted to $2,970 per pupil.[5]

Table 2

Comparing statewide expenditures and revenues for special education

	Total Amount (millions)
Revenues[a]	
State Add-on	$184.0
Federal Funds	$ 34.8
Total	$218.8
Expenditures[b]	
Certificated Personnel	$174.2
Noncertificated Personnel	$ 30.6
Nonpersonnel	$4.2
Tuition for out-of-district placements	$9.5
Total	$218.5
Excess of revenues over expenditures	$0.3

[a]Sources of state and federal revenues from Finance Division of the Kentucky Department of Education.

[b]Certificated salaries were determined from data presented in the Professional Staff Data (PSD) files from the Kentucky Department of Education.

Based on the analysis of personnel costs, it was estimated that Kentucky spends $174.2 million on certificated and $30.6 million on noncertificated personnel salaries and benefits for special education services in the public schools. Of the total $204.8 million spent on personnel, $186.9 million (or 91 percent), or $2,537 per pupil, is spent for instructional services. Special education administrative and support costs amount to $17.9 million, or about $243 per pupil. Instructional

[5]The enrollment of 73,669 equals total special education enrollment for the 1993-94 school year as reported in the Kentucky Department of Education's special education child count data.

costs represent more than 91 percent of total expenditures for special education services.

For some special education students, these special education expenditures encompass the total costs of their educational programs, while for others they represent only additional costs over and above the costs of the regular program. For those students who spend 100 percent of their time in special education programs, these expenditures represent the total costs for all educational services. For those students who spend some percentage of their time in regular classrooms, these expenditures represent only the add-on portion related to special education services. In order to account for the total costs of educational services for these special education students, it would be necessary to apportion the costs of regular education services to these students.

As suggested previously, nonpersonnel costs generally do not represent a very significant percentage of the budget for instructional services. The data provided by the sample districts for this project are insufficient to estimate the costs of nonpersonnel resources, and data from state sources are not recorded in sufficient detail to permit separation of special education costs. Nonpersonnel costs are generally difficult to estimate and would require an investment of resources by project district staff that exceeded the budget for this study. However, as a first approximation, an estimate of the overall percentage of special education program expenditures allocated to nonpersonnel was derived from data presented in Moore, Strang, Schwartz, and Braddock (1988). It is estimated that about two percent of the overall expenditures for special education programs are for nonpersonnel resources.[6] If nonpersonnel expenditures represent two percent of the total, then the total estimated amount expended on nonpersonnel resources would be $4.2 million.[7]

[6]Appendix table C3.5 (p. C-33) of the Moore et al. (1988) report is entitled "distribution of program expenditures within districts by program." Based on this table, the overall percentage of resources allocated to nonpersonnel resources was two percent. A second table in the same Appendix on page C-62 reports the "distribution of federal (EHA-B) and total expenditures for special education by type of resource." Based on this second table, the overall percentage of resources allocated to nonpersonnel resources was 14 percent. There was insufficient information reported in these tables to determine precisely what factors underlie the differences in these two figures. One does specify "within districts," perhaps suggesting that district provided programs as opposed to external placements. Perhaps the second figure includes tuition payments to external providers.

[7]If nonpersonnel expenditures represent two percent of the total, then personnel expenditures represent 98 percent of the total expenditure. Total expenditure is $209.0 (=204.8/.98) million. Nonpersonnel expenditures are therefore equal to $4.2 (=209.0 - 204.8) million.

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Two sources of data are used to estimate the tuition expenditures required for obtaining services for students outside the district in public and private day school or residential programs. The actual total numbers of students in Kentucky schools who are served in public and private day and residential programs for special education students are derived from the child count data used by the Kentucky Department of Education to report information to the Office of Special Education Programs (OSEP). Unfortunately, CSEF was unable to obtain data on average tuition levels from Kentucky Department of Education sources. Once again data on tuition and fees reported by Moore et al. (1988) are used to estimate these costs. Appendix B to this paper presents the table used to estimate the tuition costs. Estimate tuition costs ranged from around $8,333 per pupil for public day schools to $44,579 for private residential programs. Kentucky school districts reported serving 740 special education students in public or private day schools and 65 students in public or private residential programs.

What implications do these results have for whether special education services are adequately funded? Combining the tuition and nonpersonnel cost estimates with the total costs of personnel, Table 2 shows that the total expenditures on special education services in Kentucky amount to an estimated $218.5 million, compared to a total revenue generated by state and federal funding of $218.8 million. These results suggest that, overall, public school districts in Kentucky are spending approximately the same amount of money on special education as that generated by the state and federal funding. The differences that do exist between revenues and expenditures appear to be relatively small, depending on the assumptions used in estimating tuition and nonpersonnel costs.

Given the fact that, on average, nonpersonnel costs amount to about 15 percent of total current expenditures for school districts, the two percent estimate for the special education program may well be very conservative. On the other hand, some of the cost estimates for out-of-district placements may, in fact, involve double counting. That is, some districts may contract with, and pay tuition to, other public school districts to provide services to special education students in day schools or residential facilities. If this is the case, then some of the personnel counted in the districts providing the services are already reflected in the estimates of personnel costs presented in Table 2. To account for this possibility would require data on the numbers of children served in public day or residential schools who are being served by public school districts whose personnel data are included in the PSD file.

Are these funds adequate? This is a more difficult question. *Adequate for what?* To address this question would require three steps. First, state decisionmakers would have to determine what goals it wants the special education program to accomplish. Second, they would follow this up with a specification of the resource requirements necessary to achieve the goals for each category (however determined) of child served by the program. Third and finally, they would cost out these services for the state by counting the number of children in each category and multiplying the resource requirements by appropriate price (e.g., salary and benefit) figures.

A Comparison of District Level Revenues and Expenditures for Special Education

How do special education expenditures compare with revenues in individual districts or types of districts? Which types of districts exhibit systematic differences in the relationship between expenditures and revenues for special education?

The previous section examined the overall relationship between special education revenues and expenditures. *But to what extent are these overall patterns consistent across individual school districts? What are the patterns of divergence across individual districts?* This analysis focuses attention on the costs of special education personnel, since the reliability of the nonpersonnel components and the tuition payments on a district-by-district basis are less reliable.

Table 3 divides the districts into four groups defined by personnel expenditures expressed as a percentage of revenues (both state and federal) generated for special education services (i.e., 100 x expenditures divided by revenues): districts whose personnel expenditures as a percentage of revenues are less than 75 percent, between 75 and 90 percent, 90 to 100 percent, and in excess of 100 percent. The second column of the table designates the average value of expenditures as a percent of revenues in each of the four groups. The next two columns show the average values of the per pupil revenues generated and the per pupil personnel expenditures, respectively, for each group. The last two columns of the table display the number of districts and the percentage of statewide special education students enrolled in the districts that fall into each group.

Table 3 shows that more than half of the districts (97 out of 176 or 55 percent) in the state fall below the 90 percent level of personnel expenditures to revenues However, almost 59 percent of the special education students in the state are

enrolled in districts whose special education personnel expenditures exceed 90 percent of revenues. The implication is that it is the smaller districts that tend to fall below 90 percent. In fact, while less than 23 percent (40 out of 176) of districts reveal a percentage above 100 percent, these 40 districts enroll almost 37 percent of the special education students in the state. Thus, although one finds little difference between special education revenues and estimated expenditures for the state as a whole, there is considerable variation in the extent to which revenues and personnel expenditures diverge across individual districts.

Table 3

District data by categories of special education expenditures as a percentage of special education revenues

	Average Value of				
District Categories of Personnel Expenditures as percent of Revenue	Personnel Expenditures as percent of Revenues	Per Pupil Revenues for Special Education	Per Pupil Personnel Expenditures on Special Education	Number of Districts	Percent of statewide Special Education Enrollment
< 75%	68.39%	$2,974	$2,035	36	11.43%
75-90%	83.27%	$2,940	$2,447	61	29.61%
90-100%	95.41%	$2,984	$2,846	39	22.20%
>100%	108.61%	$2,984	$3,241	40	36.77%

But what are the patterns of this divergence? Which districts tend to spend more relative to the revenues generated for special education? As a way of observing these patterns of divergence between expenditures and revenues, a series of elasticity coefficients are estimated. The elasticity coefficients are simply an estimate of the percentage difference in one variable (e.g., per pupil personnel expenditures) associated with some fixed percentage difference in a second variable (e.g., district wealth). For example, the percentage effect on special education personnel expenditures associated with a 50 percent difference in the household income of families living within the district can be determined. While these relationships do not necessarily imply causation between the two variables, they do provide some valuable information about patterns of variation that are important to policymakers.

Table 4 shows the relationship between selected district characteristics and each of the three variables displayed in the columns: the special education personnel expenditures, state and federal revenues for special education, and the expenditures as a percent of revenues. The asterisks in the table indicate the level of statistical significance of the observed relationship.

Table 4 shows in column (2), for example, that the per pupil expenditures on special education personnel are higher in larger districts, but are lower in districts with higher rates of identification of special education children and greater percentages of at-risk children. No statistically significant relationship is observed between per pupil expenditures on special education personnel and poverty, average household income, and average housing value: that is, these relationships are likely to have occurred by chance and are not consistent across districts.

Column (3) shows that per pupil revenues from federal sources and generated by the state add-on are higher in larger districts and districts with greater percentages of children in poverty. Districts serving families with higher average levels of income receive lower levels of per pupil revenues for special education services. No statistically significant relationship is found between per pupil special education revenues and levels of identification, the percentage of at-risk populations, and average housing value.

But what is the relationship between these district, student, and family characteristics and the percent of special education revenues expended on special education personnel? Column (4) of Table 4 reveals the following results:

- Personnel expenditures as a percent of revenues are *inversely* related to
  - the percentage of students eligible for special education,
  - the percentage of at-risk students, and
  - the percentage of students living in poverty.

- Personnel expenditures as a percent of revenues are *directly* related to
  - per capita income in the district and
  - average housing values.

No statistically significant relationship is observed with district size, although the elasticity coefficient is positive.

Table 4

Percentage differences in special education personnel expenditures per pupil, state and federal revenues per pupil generated for special education services, and the ratio of expenditures to revenues associated with specified differences in selected district, student, and family characteristics

	Percentage Change Generated by Selected Independent Variables[a]		
Independent Variable (1)	Spec. Educ. Personnel Expenditures Per Pupil (2)	Per Pupil Revenue (Federal & State Add-On) (3)	Expenditures as a Percent of Revenues Ratio (4)
District size: 50% increase in average daily attendance (ADA)	3.48% ***	1.63% ***	1.90%
% Special education: increase in percentage of children eligible for special education from 10 percent to 15 percent [b]	-0.10% ***	-0.02%	-0.09% ***
% At-risk population: increase in percentage of children who are at risk from 5 percent to 10 percent [b]	-0.03% *	0.01%	-0.05% ***
% Poverty: increase in percentage of children who are in poverty from 10 percent to 20 percent [b]	-0.019%	0.03% ***	-0.05% ***
Average household income: a 50 percent increase in the level of household income adjusted for cost-of-living differences [b]	0.96%	-2.97% **	4.33% **
Average housing value: a 50 percent increase in the average housing value [b]	3.17%	-1.22%	4.58% **

[a]The asterisks on the values indicate the level of statistical significance of the result. Statistical significance indicates the probability that this estimated value is equal to zero (i.e., indicating that there is no relationship between the dependent variable displayed in the columns and the independent variables displayed in the rows of the table).

*** = 99% level of significance (1% chance that the value is zero)

** = 95% level of significance

* = 90% level of significance

[b]These variables (percentage of at-risk population, percentage of children in poverty, average household income, and average housing value) are derived from the 1990 U.S. Census.

The relationships between the various district characteristics presented in Table 4 do not necessarily reflect cause and effect. These numbers are derived from very simple, statistical models. A more complex statistical analysis that controls for the multitude of factors that do affect spending decisions is required to understand further these patterns of variation. Nevertheless, these do reflect statistical patterns of variation that can provide guidance to policymakers in considering the equity implications of their actions with regard to educational reform.

A Comparison of the KERA Pupil Weights with Estimated Cost Ratios

How do the three pupil weights currently in use under KERA compare with the actual costs of serving the various categories of students?

Previously, this paper has shown the overall impact of the KERA funding weights with respect to the generation of revenues available for special education services and the relationship of those revenues to personnel and other expenditures. This section examines data gathered on individual students from the sample schools referred to in Table 1. The purpose of this section is to compare the additional costs associated with providing services to each category of special education student against the additional revenues generated by the funding formula. Prior to making this comparison, it is important to understand the sources and processing of data upon which the comparison is based.

To accomplish this objective, data were gathered on the amounts of time spent by samples of individual students in different settings. In addition, within each of those settings, the special education teachers completing the surveys provided information on the amounts of time allocated by other regular and special education professionals to the program for this individual student. Data were also obtained on the class sizes, group sizes, or caseloads within which these students were served. These data are used to estimate the total instructional costs by combining statewide average hourly wage and benefit rates for the various categories of personnel involved with the time estimates. The use of the statewide average hourly wage and benefit rates ensures that the comparisons reflect only differences in service levels and not variations in wage levels across districts. Total personnel cost of instructional services are calculated for each of the individual students. The samples include both elementary and high school students.

How do the funding weights used by the state compare to the additional costs of serving special education students? Table 5 provides one approach to making this comparison. In the first column, the sample of children are divided into two groups: elementary school students and middle, junior high, and high school students. The numbers (n=) of children in the sample from which the cost estimates are based are shown in parentheses. A total of 479 children reported sufficient information to be included in the cost estimates. Also reported in parentheses are the estimate percentages (p=) of the special education population in each category within the state. Although the funding weights do not distinguish elementary from secondary students, the costs of serving these two groups of students are different. The pupil weights for each funding category of child are displayed in the second column. Remember that these weights are expressed in the form of an "add-on": that is, each reflects the additional costs of serving a special education student. The weights for speech or language, high incidence, and low incidence students are 0.24, 1.17, and 2.34, respectively. Multiplying these weights by the base per pupil allocation of $2,495 established by the Kentucky legislature for the 1993-94 school year determines the per pupil revenues generated to support the additional costs of special education services reported in the third column. Using the base allocation per pupil from the SEEK calculations, these weights generate an additional $599 (=0.24 x $2,495) for each speech or language student; $2,919 (=1.17 x $2,495) for each high incidence student; and $5,383 (=2.34 x $2,495) for each low incidence student.

The fourth column reports the sample average for the total additional *personnel* costs per pupil of providing educational services for each category of special education student. The fifth and sixth columns report the instructional and the administrative and support components which underlie the totals for each category of special education student. The instructional cost figures are based on the hours of direct services provided by special education teachers and service providers. The average administrative and support costs of $243 per pupil are taken directly from the statewide analysis of costs in Table 2.

Table 5 compares the personnel cost figures at both the elementary and secondary level by funding category with the revenues generated by the formula. At the elementary level, the amount of revenues generated exceed the personnel expenditures in two of the three categories (high and low incidences). The additional costs of serving an elementary student who is classified as speech and language *only* is $702 compared to per pupil revenues of $599. This represents a 17 percent deficit in revenues. The additional revenues for high and low

incidence students are $2,919 and $5,383, respectively, while the additional costs amount to $2,329 and $5,133, respectively. Per pupil costs are 20 percent lower than revenues for high incidence students and 5 percent lower for low incidence students.

At the middle, junior high, and high school level, the revenues generated fall short of the personnel expenditures in two of the three categories (speech or language and low incidence). High incidence students show a deficit of costs relative to revenues of 21 percent {=100 x [($2,308/$2,919) - 1)]}, while low incidence students show an excess of costs over revenues of just 6 percent {=100 x [($5,696/$5,383) - 1)]}. Students who are classified as having *only* revenues for high and low incidence students are $2,919 and $5,383, respectively, while the additional costs amount to $2,329 and $5,133, respectively. Per pupil costs are 20 percent lower than revenues for high incidence students and 5 percent lower for low incidence students.

At the middle, junior high, and high school level, the revenues generated fall short of the personnel expenditures in two of the three categories (speech or language and low incidence). High incidence students show a deficit of costs relative to revenues of 21 percent {=100 x [($2,308/$2,919) - 1)]}, while low incidence students show an excess of costs over revenues of just 6 percent {=100 x [($5,696/$5,383) - 1)]}. Students who are classified as having *only* speech and language disabilities at this level show an excess of costs over revenues of 126 percent {=100 x [($1.356/$599) - 1)]}.

The overall averages of elementary and secondary levels indicate that the revenues generated for speech and language *only* and for low incidence disabilities fall short of the average personnel expenditures, while the revenue for the high incidence categories exceed the average personnel expenditures at both levels. Note that while the costs for speech and language only students at the middle, junior high, and high school level is substantially higher than the revenues generated, the overall average is dominated by the differences at the elementary level since a substantial portion of the speech and language only students are at the elementary level. Again, nonpersonnel costs of services are not included in these estimates, so actual instructional costs will be somewhat higher than shown here.[8]

[8]In some cases, the nonpersonnel components of special education costs involve substantial initial investments in special furnishings or equipment. However, even such substantial investments often do not increase per pupil costs by as much as one might think. For example, an initial investment of $20,000 to

Table 5

A comparison of the additional per pupil revenues and costs of serving special education students classified by funding category

Student Category[a] (1)	Funding Weight (2)	Per Pupil Revenues Generated by KERA[b] (3)	Additional Per Pupil Costs Incurred[c] Total (4)	Instruction (5)	Admin. & Support (6)
Elementary school					
Speech or language (n=63, p=18.7%)	.24	$599	$702	$459	$243
High incidence (n=151, p=47.7%)	1.17	$2,919	$2,329	$2,086	$243
Low incidence (n=21, p=5.3%)	2.34	$5,383	$5,133	$4,890	$243
Middle, junior high & high schools					
Speech or language (n=5, p=0.2%)	.24	$ 599	$1,356	$1,113	$243
High incidence (n=210, p=24.9%)	1.17	$2,919	$2,308	$2,065	$243
Low incidence (n=29, p=3.2%)	2.34	$5,383	$5,696	$5,453	$243
Overall average					
Speech or language (n=68, p=18.9%)	.24	$599	$710	$467	$243
High incidence (n=361, p=72.6%)	1.17	$2,919	$2,322	$2,079	$243
Low incidence (n=50, p=8.5%)	2.34	$5,383	$5,346	$5,103	$243

[a] In the parentheses, n=the number of children included in the sample and p=the estimated percentage of the special education population within Kentucky included in the category. The overall average cost figures are calculated based on these percentage weights.

[b] These per pupil revenues are calculated by multiplying each of the funding weights by the base allocation of $2,495 per pupil.

[c] The instructional cost components in column (5) are derived from the hours of direct services provided by special education teachers and service providers for elementary and secondary students. The administrative and support component is derived from Table 2 which shows the average per pupil cost of administration and support services for the state as $243. The instructional cost figures are weighted to reflect population estimates. Unweighted figures do not change the figures significantly, nor the conclusions of the analysis.

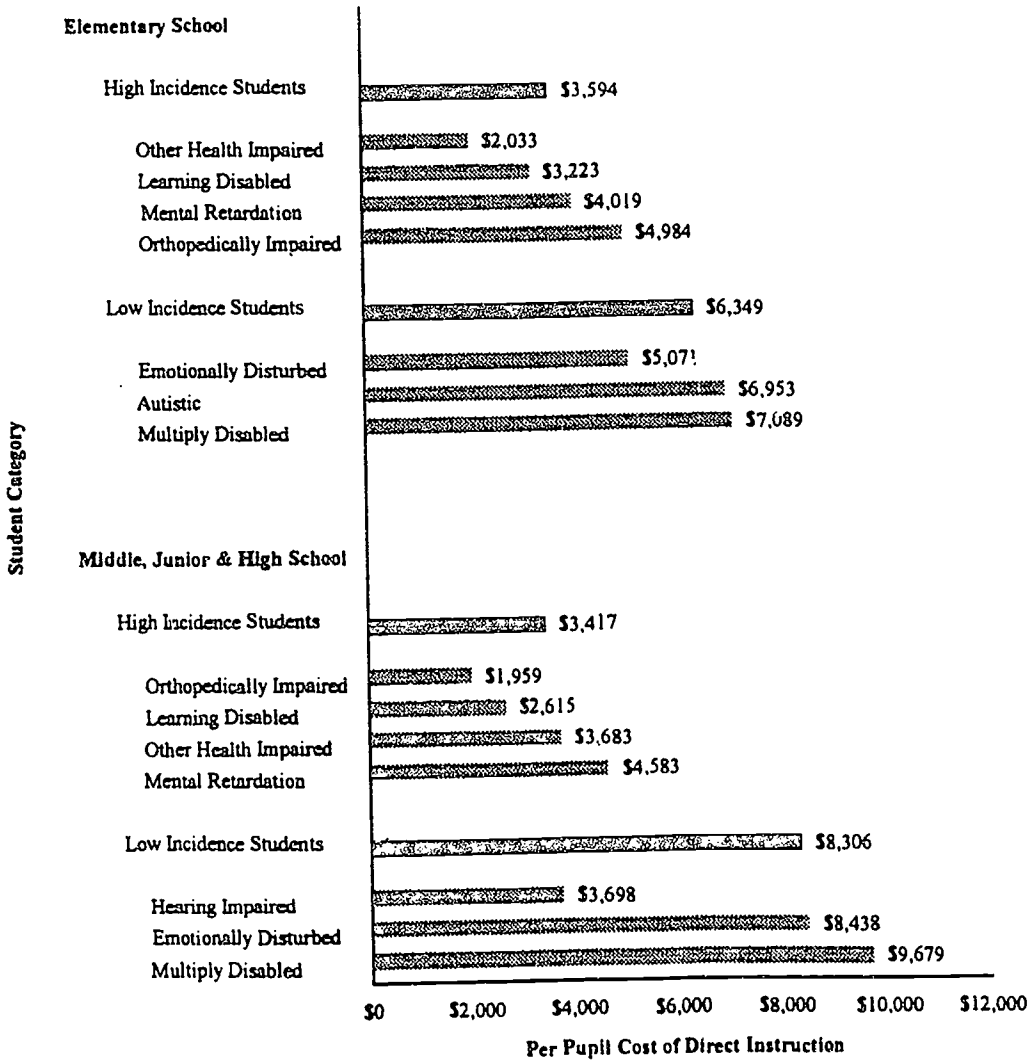
equip a special classroom must be depreciated over the life of the equipment. If one assumes a ten year life of the items, the annualized cost is $2,000. If this equipment is shared by five to ten other children, then the per pupil cost each year is $200 to $400. While such costs should not be regarded as inconsequential. They are still small when compared to the costs of special education personnel.

Underlying these overall average cost figures for students in each of the funding categories, there are considerable variations in the costs of serving different categories of special education students. Figure 1 illustrates these patterns of variations. The students are divided according to level (elementary versus middle, junior high and high school) and disability within the two funding categories of high and low incidence students. Within each funding category, average costs by disability are listed from the lowest to highest cost. The data reported in this figure encompass all of the direct personnel costs associated with direct instructional services, including regular as well as special education.

For high incidence elementary students, the per pupil costs of instructional personnel range from a low of $2,033 for other health impaired students to a high of $4,984 for orthopedically impaired students. For low incidence elementary students, these per pupil costs range from $5,071 for emotionally disturbed students to a high of $7,089 for multiply disabled students. That is, the ratio of highest to lowest cost for high incidence is 2.5 to 1 and for low incidence is 1.4 to 1. For middle, junior high, and high school students, these ratios are 2.3 to 1 for high incidence students and 2.6 to 1 for low incidence students.

Figure 1

Weighted average per pupil costs of personnel providing direct instructional or related services for special education students classified by the disability categories included within each funding category (high and low incidence) [a, b, c]



[a] This figure includes only direct personnel costs of instructional and related services. The costs of school, program, or direct administrative and support services, as well as the costs of nonpersonnel resources, are excluded from the figure.

[b] The black bars for each of the high and low incidence students are weighted averages of the gray bars corresponding to each of the groups of disabilities categories.

[c] Certain disability categories are not represented in the random sample of students used for this analysis. For example, developmentally delayed students were not identified among the elementary categories. In addition, the categories mental disability, deaf/blind, hearing impaired, visually impaired, and traumatic brain injury were not identified among the low incidence students. These categories of students were not intentionally excluded, but rather no surveys were received for these students. Moreover, mental retardation is included in the high incidence category when in fact some of these students may be more severely retarded and actually belong in the low incidence category. Data on these students were not sufficient to make this distinction.

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V. Policy Implications of Cost Analysis

Figure 1 illustrates that there are substantial variations in the levels of services, student needs, and costs even within funding categories. Districts with different combinations of students according to disabilities within funding categories may face very different needs for, and costs of, services even though the revenues generated by the KERA weights will not differ. Such patterns of variations in needs and costs may well explain the variations observed in the overall level of expenditures relative to revenues across individual districts. Demands for greater equity would require a more detailed categorization of students in a way that would better equate the costs with the revenues generated by the finance system.

However, balanced against these equity concerns are the incentives created by alternative formulas. Overall, the current formula provides sufficient revenues to cover the average costs of special education services in most districts. At the same time, the formula itself does not create any significant incentives for placement of students. For all intents and purposes, students are funded on the basis of disability rather than placement. There is no particular fiscal incentive built into the funding formula whether a student of a particular disability is served in a collaborative arrangement or a separate environment. For the most part, districts currently appear to have the flexibility to serve children in the ways they see fit.

Unfortunately, flexibility may be somewhat limited if an individual district does not have sufficient funds to provide services appropriate to the composition of children that it serves. There is some evidence that the extent to which revenues cover expenditures varies considerably across districts. Forty districts enrolling

almost 37 percent of the special education students in the state show personnel expenditures that exceed the revenues generated. Seventy-nine districts enrolling almost 60 percent of the state's special education enrollment spend more than 90 percent of the revenues generated by the formula under KERA on special education personnel.

At the same time, the evidence also suggests that some districts are receiving *more* than sufficient funding to serve the special education populations they identify. This is evidenced by the fact that 36 of the districts exhibit ratios of special education personnel expenditures to revenues below 75 percent. On the other hand, these same districts may be using a portion of regular education funds for implementing prereferral strategies that prevent children from being classified as special education in the first place. The data collection for this study were not intended to identify the extent to which such approaches were being taken by district decisionmakers. But for those interested in reducing unnecessary identification of children for special education, such approaches represent important policy alternatives. *To what extent are special or regular education funds expended on strategies for prevention and to reduce identification rates? Is this an appropriate use of special education funds?*

VI. Perspectives on the Special Education Funding System from Sample Directors

The special education directors from the sample districts interviewed for this study generally found the current special education funding system to be an improvement over the previous funding mechanism. It was said to have greater incentives for inclusion and fewer incentives to label children. Most of the respondents view greater spending flexibility at the district level as a strength. Many directors felt that the blending of funds was moving districts toward greater funding equity and increased ability to meet the needs of individual students. Due to more collaborative and inclusive teaching practices, they perceived that student placement decisions were being more carefully considered and examined. Most directors believed the new system created greater overall incentives to do what was best for the child. Districts were no longer penalized for mainstreaming, as had been the case under the old system.

When asked for their concerns with the current system, directors described insufficient state and federal funds, and the way in which the new system was based on total available funds rather than on the actual costs of providing services. Other concerns included a lack of funding to meet the demand for related services and the sometimes prohibitive costs of the district match required for assistive technology, especially in smaller districts. In addition, restrictions on class size, the increasing burden of paperwork, and the need for staff development and instructional materials were issues yet to be resolved. Directors saw a general lack of funding as the biggest restriction to providing some of the "best practice" approaches they would like to encourage.

Differences across districts in the perceptions of how well the funding system works are likely to be related to factors that affect the extent to which special education expenditures match the revenues generated for these services.

VII. Summary and Conclusion

The purpose of this study was to explore the patterns of resource allocation to special education that have occurred in response to the passage of the Kentucky Education Reform Act (KERA) of 1990. The estimates presented in this paper indicate that overall revenues generated by the KERA formula for special education ($218.8 million) are approximately equal to the marginal costs of special education services ($218.5 million).

Despite the high degree of parity between special education revenues and costs statewide, considerable differences in the relative degree of alignment across individual types of districts are observed. On average, the ratio of special education expenditures to revenues are *lower* in districts with higher identification rates and districts serving greater percentages of at-risk students and students in living in poverty. The ratio of special education expenditures to revenues are *higher* in districts serving wealthier communities.

Overall, the levels of funding generated by the three pupil weights approximated reasonably well the marginal costs of serving special education students categorized according to the funding weights. However, considerable variation in the per pupil costs of special education services exists within the funding categories, which may help to explain the significant variation in the ratios of expenditures to revenues across districts.

Special education directors generally indicated that KERA was an improvement over the previous system largely due to the increased flexibility and discretion they had over spending decisions and the reduced incentives for the placement of children in particular types of programs. Districts found that they are able to spend more time on issues related to student learning and less time on strict fiscal and resource accountability.

At the same time, the KERA formula does not tie revenues very close to the variations in the costs of serving special education student across districts. This would require a more detailed system for classifying students according to needs or services. Detailed funding systems based on service configurations may tend to create incentives for student placement. What is required is a funding system based on characteristics of students that reflect *need* while at the same time being outside the control of local decisionmakers. That is, the procedures for classifying students must be highly reliable and consistent across districts.

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Appendix A

Explanation of the SEEK Formula

Calculation of State SEEK Contribution for 1993-94:

TS = (TB + TA + TT + TH + TE) - TL

TS	=	State SEEK Contribution
TB	=	Total Base Allocation
TA	=	Total At-Risk Add-on
TT	=	Total Transportation Add-on
TH	=	Total Home and Hospital Add-on
TE	=	Total Exceptional Child Add-on
TL	=	Total Required Local Effort (RLE)

where:

TB	=	$2,495 x (92/93 District ADA)
TA	=	$2,495 x FLP x .15, where FLP is defined as children eligible for the Free Lunch Program
TT	=	Prior year "graph adjusted" costs for transporting pupils living a mile or more from school
TH	=	$2,395
TE	=	(NL x WL x PB) + (NH x WH x PB) + (NS x WS x PB)—described in detail below
TL	=	.30 (per $100 of district's assessed property value)

As presented in the above formula, the base amount remains constant for all school districts. Each adjustment (i.e., at-risk students, transportation, home and hospital, exceptional children) and the RLE will vary for individual school districts. The total state Base SEEK contribution may also be adjusted by Tier I, Tier II, a Vocational Education deduction, hold harmless contribution, and an adjustment to the appropriation. The vocational education deduction subtracts 30 percent of the state-funded base for each student in ADA attending the state vocational schools. Under hold harmless, districts are guaranteed the same per pupil state funding they received in the 1991-92 school year. Even so, a reduction in ADA could result in a district receiving fewer total state dollars. The SEEK funding is proportionately reduced due to insufficient funds appropriated for the 1992-94 biennium. District funds cannot be reduced below the hold harmless level. Finally, all SEEK calculations are made on a per pupil basis and calculated amounts apply to each pupil in the district (Adams, 1993; Kentucky Department of Education, 1993). The following formula demonstrates how a district's total SEEK funding is calculated.

District's Total SEEK Funding:

$$TD = (TS + T1 + T2) - TVE + THH + TAA$$

TD	=	District's Total SEEK funding
TS	=	Total State SEEK Contribution
T1	=	Total for Tier I
T2	=	Total for Tier II
TVE	=	Total Vocational Education Deduction
THH	=	Total Hold Harmless
TAA	=	Total Adjustment to Appropriation

Appendix B

Estimation of Tuition Costs for Out-of-District Placements

Table B-1 presents the results of the analysis to estimate the costs of tuition payments by districts for those students served in public and private day and residential schools (i.e., for out-of-district placements). The estimated tuition levels derived from the Moore et al. (1988) report are adjusted for inflation using the services (excluding medical) component of the consumer price index. The final column of the table reports the total estimated costs of serving each of these categories of children. If these cost estimates are accurate, they suggest that districts may be spending an additional $9.5 million on out-of-district placements.

Table B-1. Estimates of the costs of tuition payments for out-of-district assignments for special education students

Type of placement	Actual Total Number of Estimated Tuition[a]	Students Served in KY	Total Costs
Day schools:			
Public	$ 8,333	555	$4,624,815
Private	$11,656	185	$2,156,360
Residential schools:			
Public	$39,909	40	$1,596,360
Private	$44,579	25	$1,114,475
Total			$9,492,010

[a]The services component (excluding medical services) of the consumer price index shows an annual inflation rate of 4.4 percent over the years 1985 to 1992 (*The Economic Report of the President*, 1993, p. 414). The original data presented in the Moore et al. (1988) report on costs of services were for the 1985-86 school year. These cost figures were adjusted to 1993 levels for a total inflation of 41 percent based on the estimated annual rate of 4.4 percent.

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