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UK Center for Poverty Research

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School Accountability and the Education of Low-Income Children

David Figlio

The federal No Child Left Behind Act of 2001 (NCLB) continued a national trend toward increased school accountability—the notion that schools should face rewards and sanctions based on the performance of their students. Major motivating factors behind the accountability movement are the facts that many students attend schools that are underperforming, and that certain groups, such as low-income families and racial and ethnic minorities, face low-quality schools more frequently than do others. This concern is evident even in the name of NCLB, which evaluates schools not only on aggregate student performance, but also on the performance of each measurable racial, ethnic, and economic subgroup. The goal of NCLB is that 100 percent of students be proficient in reading and mathematics by the 2013-2014 school year.

The mechanism through which NCLB works is the Title I program, the primary source of federal aid to elementary and secondary schools. Title I funds are distributed to schools on the basis of the number of students from low-income families in attendance, so the federal accountability system is explicitly focused on the schools that low-income students attend in large numbers. Schools that persistently fail to meet federal performance standards lose a fraction of their federal financing and may face personnel sanctions. In addition, their students are provided with increased school choice under the federal plan. Many state systems invoke similar types of sanctions for low performance, while also offering rewards for high performance. For instance, under Florida's school accountability system, known as the A+ Plan for Education, schools that are persistently labeled as failures face loss of students to the public and private sectors through "Opportunity Scholarship" vouchers, while schools that improve according to the state's system, or that receive the highest grade in the system, receive monetary rewards. In addition, schools that are labeled as low-performing in Florida receive additional financial and technical assistance from the state.

Most state accountability systems, along with NCLB, evaluate schools based on the fraction of students brought to "proficiency" levels. Therefore, most accountability systems provide the strongest incentives to bring up the bottom portion of the student test score distribution. Because the set of students who are most at risk of not meeting proficiency standards is disproportionately composed of racial and ethnic minorities, as well as low-income students (Figlio 2003b), schools face incentives to concentrate resources so that they improve the outcomes of disadvantaged students. Moreover, under some systems the schools that are most at risk of accountability sanctions are overwhelmingly low-income, indicating that if these schools are more apt to respond to accountability pressure than are more affluent schools, then low-income and minority students may disproportionately benefit academically from school accountability pressures. In these cases, school accountability systems such as NCLB and many state systems could reduce the performance disparities between advantaged and disadvantaged students.

Some very early evidence from Florida suggests that this may be the case. Figlio and Rouse (2003), studying the initial effects of Florida's A+ Plan, followed students over time and find that schools apparently concentrated efforts in educating the lower-achieving students in the school. Their results indicate that while higher-achieving students appeared to fare worse on

(continued on p. 3)

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Letter from the Director

James P. Ziliak

This issue of *Insights on Southern Poverty* focuses on recent reforms to K–12 and higher education in four states in the South. Expanding the human capital capacity of our youth has long been a key public policy to eradicate poverty. On average, the typical college graduate earns at least 50 percent more than the typical high school drop out. Economists have conducted hundreds of studies examining the rate of return to an additional year of schooling, with a modal estimate of about 10 percent. To put this return into perspective, it is comparable to or larger than the long-run inflation-adjusted return on financial capital. Given the sizable economic and social returns to human capital investment it is natural for policy makers to encourage and foster its acquisition. While there is near unanimity on the social merits of human capital, there is much disagreement on how to efficiently and equitably deliver this highly valued resource. The articles in the current issue of *Insights* touch upon some of the important issues confronting education reform, including unintended consequences of policies.

David Figlio of the University of Florida and the National Bureau of Economic Research begins the issue examining the federal No Child Left Behind Act and state accountability systems, explaining how, although school accountability systems have the capacity to improve the outcomes of disadvantaged students, school responses to fiscal incentives may reduce or instead might exacerbate student inequality.

Next, Christopher Cornwell and David B. Mustard of the University of Georgia discuss Georgia's HOPE Scholarship Program, and how, although it raised first-time college freshmen enrollment rates, it has become more difficult for African-Americans to attend Georgia's most selective universities. They also show that since the state lottery finances the HOPE program, the costs are disproportionately borne by lower-income and African-American families, while the benefits of HOPE Scholarships tend to accrue to students from middle- and upper-income families.

Julie Berry Cullen of the University of Michigan and the National Bureau of Economic Research, Mark C. Long of The George Washington University, and Randall Reback of Barnard College address the issue of state's use of alternative higher-education admissions rules than traditional affirmative action policies. Focusing on Texas's Top-Ten Percent Rule, they highlight that an unintended consequence of this reform is increased student mobility across high schools in order to place into the top 10 percent. This strategic mobility has increased disparities among students in the top-10 percent of their high school class, thus reducing the effectiveness of the reform.

Finally, William Hoyt of the University of Kentucky and Sheila Murray of the Rand Corporation examine one of the most far-reaching K–12 reforms in the nation—the Kentucky Education Reform Act (KERA). They demonstrate that although KERA has achieved funding equity, it has accomplished little in terms of efficiency and equity in educational performance.

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School Accountability and the Education of Low-Income Children (continued)

nationally norm-referenced standardized examinations after the initial implementation of Florida's accountability system, lower-achieving students, who are more likely to be minority or low-income, tended to improve their test scores in the wake of the A+ Plan. They find that these effects occurred both for schools receiving high accountability grades and for schools at high risk of sanctions, indicating that the schools most at risk of sanction under the accountability system were no more likely to improve low-achieving students' scores than were schools facing low sanction risk. These results, therefore, indicate that school accountability systems, at least in Florida, may lead toward more equality of outcomes.

Several other studies, however, suggest that schools may have attained success in the accountability system in part through artificial means. The most researched school response involves the reclassification of students as learning disabled in order to remove them from the testing pool. Cullen and Reback (2002), Figlio and Getzler (2002), and Jacob (2002), studying school responses in Texas, Florida, and Chicago, respectively, all find evidence that schools tend to reclassify low-achievers as disabled in the wake of high-stakes accountability systems. Because low-achieving students are more likely to be from low-income or minority groups, they are the most likely to be affected by this behavioral response. It is not obvious whether this apparent response is good or bad for children: On the one hand, it may reflect "gaming of the system," with schools strategically selecting children out of the testing pool and into a less appropriate educational environment. On the other hand, the school accountability system may have led schools to correctly classify students who had not received the services that they ought to have been receiving before, perhaps because the costs of special education are high. It should be noted also that under NCLB, the test scores of children with learning disabilities are still counted for the purposes of school accountability, so this reaction to accountability systems may be dampened or altered in light of the federal system.

> ***"The goal of NCLB is that 100 percent of students be proficient in reading and mathematics by the 2013-2014 school year."***

Other evidence of behavioral responses to school accountability systems are more suggestive of gaming the system. Figlio (2003a), for instance, finds that schools subject to accountability pressure sometimes use selective discipline as a mechanism of shaping the test pool. Specifically, this research shows that schools tend to more harshly discipline low-achieving students during the testing window than during other times of the school year, relative to high-achieving students punished for the same offense, and that this relative differential is only observed in the high-stakes testing years. In another study, Figlio and Winicki (forthcoming) find that schools facing the threat of sanctions in Virginia's Standards of Learning (SOL) accountability system responded by dramatically increasing the caloric content of school meals on testing days. Since there exists a substantial nutrition literature indicating that calories are linked to short-term cognitive performance, this result suggests that schools attempted to artificially boost test scores by boosting calories. Both papers find evidence that these strategies may have worked (in terms of higher aggregate test scores), leading to the conclusion that some of the gains in test scores enjoyed by low-achieving, high-poverty schools may be the result of strategic behavior rather than real efficiency gains. These studies provide both a cautionary tale about what accountability systems can be expected to accomplish in the short term, as well as lessons for how to design school accountability systems that minimize the incentives to game the system.

School accountability systems can also have equity implications from a fiscal perspective. While likely not the case for so-called "value-added" accountability systems, those that evaluate schools on the basis of aggregate levels of student test performance (such as NCLB) are considerably more likely to sanction high-poverty schools than low-poverty schools. Figlio (2003b), simulating the fiscal effects of NCLB in Florida, estimates that the schools that will be sanctioned under NCLB are significantly poorer and more heavily African-American than most schools in general and, even, the high-poverty Title I schools. Since NCLB removes resources from schools that persistently fail to make "adequate yearly progress" according to the federal measure, this suggests that school accountability systems patterned after NCLB (including the federal law itself) could be fiscally disequalizing, thereby working in the opposite direction of the above-measured equalizing responses of schools to school accountability measures. Therefore, from a financial perspective, school accountability systems such as NCLB may work to counteract the fiscal equalization measures pursued by many states in response to perceived inequities in the state school funding systems.

The historical experience with fiscal accountability suggests that input prices may also change with increased academic performance accountability. Figlio and Rueben (2001) show that one consequence of the tax revolt of the late 1970s and 1980s was that many higher-quality teachers left teaching and tended to be replaced by lower-quality teachers (where quality is measured by teachers' test scores). Figlio and Rueben find that much of this response was not due to actual changes in resources but rather, apparently, to changes in perceptions of teachers. This may explain why Figlio (1997) and others find evidence of much larger effects of tax limits on test scores than would be predicted by looking at the changes in actual school revenues and spending. Therefore, teacher input costs may increase with school accountability, and this increase may be borne particularly by high-poverty school districts—precisely the districts that already face higher teacher costs for any given unit of teacher quality. It remains to be seen whether similar patterns occur with the current round of academic performance-based accountability systems.

In summary, school accountability systems have considerable promise for improving outcomes of disadvantaged

students, but also raise causes for concern. Early evidence from Florida indicates that low-achieving students may have benefited academically in the short-run immediately following the introduction of the A+ Plan for Education. But disadvantaged students may be harmed by the fiscal implications of some accountability systems such as NCLB, and may be differentially affected—either positively or negatively—by school responses to the incentives embedded within school accountability systems. The current accountability movement could result in reduced inequality in outcomes, but under some circumstances it could exacerbate this inequality.

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Young Investigator Development Grant Program

The Young Investigator Development Grant Program is intended to provide development funds to support new and continuing research on poverty by young academics in the social and behavioral sciences. The program offers seed funds for the support of research time or resources in the hope that the projects will develop into more full-fledged research paradigms and thus a new corps of young poverty scholars with an expertise on the South. Another goal of this competition is to offer mentoring and networking opportunities to young poverty scholars, and to this end, award winners are expected to attend the annual UKCPR Small Grants Conference on the University of Kentucky Campus.

Eligibility is restricted to untenured junior faculty within seven years of receipt of Ph.D. See http://www.ukcpr.org/FundingOpps.html for full application details.

The deadline for proposals is February 2, 2004.

Georgia's HOPE Scholarship Program: Enrollment Gains and Lottery Finance

Christopher Cornwell and David B. Mustard

Program Overview

Initiated in 1993 and funded by a state lottery, Georgia's HOPE ("Helping Outstanding Pupils Educationally") program provides two types of college financial aid—the merit-based HOPE Scholarship and the HOPE Grant. Through October 2003, more than $2 billion in program funds have been disbursed to over 730,000 students. National attention has been focused on the scholarship and at least fifteen other states have implemented or proposed merit-aid programs using the HOPE model. States have typically justified their actions in three ways: (1) to increase college enrollments in the state; (2) to stem the "brain drain"; and (3) to promote academic achievement.

To qualify for the HOPE Scholarship students must graduate with a "B" average from a Georgia high school. There is no means test.[1] For HOPE Scholars in degree-granting public institutions, the program covers full tuition, mandatory fees, and a book allowance; the value of the award is about $4,000 at the state's flagship institutions for the 2003-2004 academic year. Scholarship recipients attending in-state, private, degree-granting institutions receive a standard award of $3,000 per academic year toward tuition. Once in college, students must maintain a "B" average with a minimum number of credits to retain the award. In contrast, eligibility for the HOPE Grant does not depend on high school GPA and its coverage is limited to tuition and fees associated with non-degree programs offered (mostly) by technical schools.

Table 1 provides a breakdown of program disbursements in terms of the number of awards and dollars of aid from 1993 to 2002.[2] Degree-granting institutions accounted for 55 percent of all awards and 82 percent of total aid during this period, with four-year colleges and universities representing, respectively, 44 and 60 percent of these totals by themselves. Thus, the lion's share of program resources is devoted to the merit-based scholarship—in particular, to high school graduates matriculating at four-year schools. The other 45 percent of awards flowed to technical schools in the form of grants, but these institutions receive a relatively small proportion of total aid due to their low tuition.

Until the eligibility criteria for the scholarship were stiffened in 2000,[3] the share of HOPE funds allocated to the scholarship component of the program grew steadily. Between 1993 and 1999, the number of HOPE-eligible high school graduates rose over 50 percent, from 29,840 to 45,149, and the proportion of high school graduates satisfying the merit requirements increased from 48 percent to almost 65 percent. Even after the rules change, the fraction of high school graduates qualifying for the scholarship has approached 60 percent.

Table 1
Numbers of HOPE Awards and Amount of Aid, by Institution Type, 1993-2002

Institution Type	Number of Awards (Percent of Total)	Aid in Millions of Dollars (Percent of Total)
Four-Year Schools	526,033	$942.00
Public	389,452	$840.09
	(32)	(53.7)
Private[b]	136,581	$101.91
	(11.2)	(6.5)
Two-Year Schools	144,061	$279.43
Public	109,362	$237.48
	(9)	(15.2)
Private[b]	34,699	$41.95
	(2.8)	(2.7)
Technical Schools[a]	547,078	$342.86
	(44.9)	(21.9)
HOPE Program	1,217,172	$1,564.30

Source: Georgia Student Finance Commission, http://www.gsfc.org.

Note: [a] Of the thirty-four HOPE-eligible technical schools, thirteen offer Associate's degrees, and therefore can award both the scholarship and grant.

[b] Private two-year and four-year schools were eligible to participate only from 1996.

[c] A few public, four-year and two-year institutions also offer technical certificates and diplomas.

Program Effects on Georgia College Enrollments

Cornwell, Mustard, and Sridhar (2003) examine the HOPE program's effects on enrollments in Georgia colleges. For the 1988-1997 time period (which covers five years before and after the program's introduction), we compare enrollment rates in Georgia with those in the other member states of the Southern Regional Education Board (SREB), using data from the National Center for Education Statistics (NCES). Our findings, which take into account differences in state-level personal incomes and wages, are summarized in Table 2. The first two columns of the table present estimated enrollment rate changes due to HOPE for all schools and by institution type, with the enrollment rate defined as the ratio of first-time freshmen enrollees to recent high school graduates. The second two columns report the results of separate analyses for blacks and whites at four-year schools (where the overall program effect is concentrated), but in this case

the denominator in the enrollment ratio is the number of eighteen- and nineteen-year-olds, because high school graduate data are not available by race.

Table 2

Estimated Changes in the Enrollment Rate in Georgia Colleges Due to HOPE, 1988-1997

Institution Type	Change in the Enrollment Rate[a]	By Institution Type and Race	Change in the Enrollment Rate[b]
All Institutions	9%	**Public four-year**	
Public, four-year	12%	All Races	9%
Private, four-year	20%	White	4%
Public, two-year	-	Black	27%
Public, two-year + Technical	-	**Private four-year**	
		All Races	16%
		White	9%
		Black	14%

Source: Cornwell, Mustard, and Sridhar (2003).

Note: [a]The enrollment rate is defined as the ratio of first-time freshmen enrollees to recent high school graduates.

[b]The denominator in the enrollment rate is the number of eighteen- and nineteen-year-olds.

Program Effects by Institution Type

First, we find that HOPE raised the first-time-freshmen enrollment rate in Georgia about 9 percent relative to the rest of the SREB between 1988 and 1997. Second, the data from the different types of postsecondary institutions show that virtually all of the increase was realized in four-year public and private schools, with the enrollment rate rising 12 percent in the former and 20 percent in the latter. Enrollment rates in two-year schools showed no net change, as individuals who would have otherwise entered the labor market filled the seats vacated by students pursuing four-year degrees. However, some of the costs of new two-year-school enrollees were likely financed by the HOPE Grant, which applies exclusively to non-degree programs at two-year and technical schools and has no merit requirements. Had it not been for the grant, the enrollment rates in two-year institutions would likely have decreased.

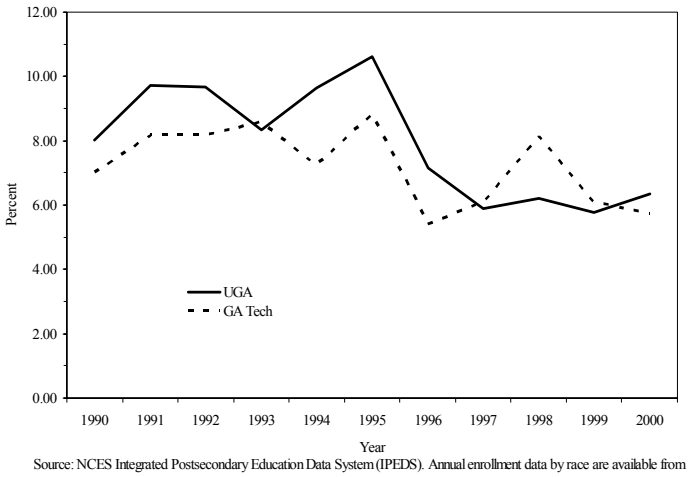
In terms of enrolled students, the Cornwell et al. results suggest that the HOPE program increased the total number of first-time freshmen in Georgia colleges by roughly 4,100 per year between 1993 and 1997. This represents about 12 percent of high school graduates who qualified for the scholarship during these five years and 21 percent of those who took the award. However, the overall program response involves enrollees at two-year schools, who are more likely recipients of the grant, and there were at least as many of these individuals as HOPE Scholars over the period. Thus, the overall, program-induced enrollment increase amounts to roughly 10 percent of all first-year program beneficiaries.

Program Effects by Institution Type and Race

The overall pattern depicted in the first two columns of Table 2 is generally replicated when we separately analyze enrollments by race. For both African-Americans and whites, HOPE's influence is largely confined to four-year schools, with the greater percentage increases for African-Americans in public institutions. Part of the explanation for sizeable estimated percentage increases in black enrollment rates in Georgia colleges is that African-Americans had much lower enrollment rates to begin with; therefore, a relatively small jump in the fraction of black eighteen- and nineteen-year-olds enrolling in a Georgia college can account for a large percentage change. Further, Georgia is home to a number of historically black colleges and universities (HBCUs), providing an added incentive for African-Americans to choose an in-state four-year college. The data indicate a substantial policy effect for these institutions.

Further, the increases in black enrollments have generally occurred at Georgia's less selective schools, which include the HBCUs, all but one of which is rated "less competitive" by *Barron's Guide*, the fifth of the six ranking categories. There has been no corresponding rise in black enrollment rates at the state's more selective institutions, the University of Georgia and Georgia Institute of Technology. Bugler, Henry, and Rubenstein (1999) reported that the average black fraction of first-year, in-state enrollments in all state postsecondary institutions was 18 percent over the 1988-1992 period. Between 1993 and 1998, the average share rose to 22 percent. In contrast, the black share of freshmen enrollments at the state's most selective institutions, the University of Georgia and Georgia Tech, has fallen during the HOPE period (see Figure 1). At the University of Georgia, which has experienced the largest increase in SAT scores of entering students during the HOPE period, the percentage of blacks in the freshmen class has dropped sharply since 1995, when the income cap on scholarship eligibility was removed.

Figure 1. Percent of UGA and Georgia Tech Freshmen Who Are African-American, 1990-2000



Source: NCES Integrated Postsecondary Education Data System (IPEDS). Annual enrollment data by race are available from IPEDS since 1990.

Because the SAT is one of the main criteria for admission at Georgia and Georgia Tech, and African Americans as a group score lower on the SAT, they are disadvantaged when seeking admission to these universities, which have seen their average freshman SATs rise during the HOPE period.

Staying Home and Moving Up

In addition to quantifying the overall and race-specific program effects, Cornwell et al. attempt to sort out to what degree they can be attributed to HOPE's incentive to attend an in-state college versus moving up from a two-year to a four-year school. A careful examination of the four years of student residence and migration data available from the NCES suggests that HOPE's influence on the in-state-out-of-state margin accounts for about 75 percent of the HOPE effect on *recent* freshmen enrollments at four-year schools. (By "recent" freshmen, we mean those who enter college within twelve months of high school graduation.)

However, this result misses the "late matriculators," who represent perhaps as much as two-thirds of the overall program effect. By virtue of their delayed entry, we suppose these students are generally not candidates to leave the state to attend college, but are more likely to be the type who is induced to move up from a two-year to a four-year school by the scholarship.

Unfortunately, the residence and migration information is generally limited to recent freshmen, so it is not possible to infer much from the data about the movements of late matriculators. In any case, our combined recent and all-freshmen findings point to the conclusion that the scholarship's reduction of the four-year-two-year relative price represents a substantial share of the overall HOPE effect.

Financing HOPE

Since the HOPE program is financed by a state lottery, the cost of the program is borne by lottery players. The literature is remarkably consistent on some basic characteristics of the typical player: male, low-income, low educated, and African-American. Consequently, lotteries are a regressive form of taxation, one that places a relatively greater burden on the poor.[4] Acknowledging this, the National Gambling Impact Study Commission (1999) recommended that "States with lotteries reduce their sales dependence on low-income neighborhoods" (pp. 3-19).

Compared with the other thirty-eight state lotteries, Georgia's is widely recognized as one of the most successful. It is the only lottery that increased revenue in each of its first seven years, and it has the second highest per capita sales of any lottery in the nation. Sales rose steadily from just over $1 billion in fiscal year 1994 to almost $2.5 billion in the 2003 fiscal year. By 1997, per capita sales were $238 per person, trailing only those of Massachusetts (National Gambling Impact Study Commission 1999).

Cornwell and Mustard (2003) show that the typical Georgia player is very similar to his counterpart in other states. Tables 3 and 4 illustrate their main findings using the most recently available (2001) data. In Table 3, Georgia counties are divided into per capita income quintiles, and per capita lottery sales, average per capita income, and sales as a percentage of income are reported for each. Per capita sales are lowest in the highest-income counties, with the average county in the top quintile of the income distribution contributing almost $50 less per person per year than the typical bottom-quintile county. In terms of the fraction of income spent on lottery tickets, the disparities are even larger: the share in the lowest-income quintile (1.89 percent of income) is about twice that of the highest-income quintile (1.03 percent).

Table 3
Lottery Sales by Income Quintile, 2001

Variable	Quintile 1 < $18,590	Quintile 2 $18,590-20,000	Quintile 3 $20,000-21,700	Quintile 4 $21,700-24,355	Quintile 5 > $24,355
Lottery Sales Per Capita	$330	$304	$378	$326	$283
Avg. Per Capita Income	$17,179	$19,251	$20,871	$22,702	$28,405
Avg. Sales as Percent of Avg. PCI	1.89	1.58	1.81	1.43	1.03
Number of Counties	32	32	31	32	32

Note: All income variables are in real dollars calculated using the Consumer Price Index with 1998 as the base year.

Table 4 shows how lottery sales vary by the racial composition of a county. In this case, Georgia counties are grouped into quintiles by the fraction of their population that is African-American. Counties with high concentrations of African-Americans are much more likely to have high levels of lottery sales. In the least black (most white) quintile, per capita sales averaged $265.15, representing 1.2 percent of per capita income. In contrast, counties with the greatest share of African-Americans had mean sales of $457.55 (almost 75 percent greater), accounting for 2.24 percent of income (twice as high).

"Because the SAT is one of the main criteria for admission at Georgia and Georgia Tech, and African Americans as a group score lower on the SAT, they are disadvantaged when seeking admission to these universities, which have seen their average freshman SATs rise during the HOPE period."

Table 4
Lottery Sales by Quintile of Black Population, 2001

Variable	Quintile 1 < 10.8 Percent	Quintile 2 10.8-23.4 Percent	Quintile 3 23.4-31.0 Percent	Quintile 4 31.0-43.715 Percent	Quintile 5 > 43.715 Percent
Lottery Sales Per Capita	$265	$251	$299	$346	$458
Avg. Per Capita Income	$22,419	$23,116	$20,728	$20,574	$21,566
Avg. Sales as Percent of Avg. PCI	1.2	1.14	1.44	1.7	2.24
Number of Counties	32	32	31	32	32

Summary

In the first five years of the program, Georgia's HOPE Scholarship raised the first-time freshman enrollment rate by 9 percent relative to the enrollment rates of other member states of the SREB. This gain was realized primarily at four-year institutions, a pattern that held for both whites and African-Americans. For African-Americans, Georgia's HBCUs amplify the HOPE discount for in-state schools. However, the evidence suggests HOPE has made it more difficult for African-Americans to matriculate at the state's most selective institutions (specifically, Georgia and Georgia Tech), because of the scholarship's effect on college stratification by SAT scores.

Since the program is financed by a state lottery, its costs are disproportionately borne by lower-income and African-American families, who spend a larger share of their incomes on the lottery than more affluent and white families. However, because high school academic achievement and family income are positively correlated, the HOPE Scholarship tends to benefit students from middle- and upper-income households.

[1] In the first year of the program, there was a household income cap of $66,000. This cap was raised to $100,000 the following year and eliminated entirely thereafter.

[2] Note that "awards" does not equal "recipients" because a single recipient receives an award each year she qualifies, and, in the case of the grant, she can receive multiple awards within the same year, depending on the nature of the vocational training program.

[3] Scholarship requirements changed for high school classes that graduated in 2000 and later. Previously, the GPA requirement was defined in terms of college preparatory courses. Now, to receive HOPE, high school students must have a "B" average in the strictly academic courses that make up the "core curriculum."

[4] The evidence for regressivity comes from Pennsylvania (Spiro 1974; Heavey 1978), Connecticut and Massachusetts (Brinner and Clotfelter 1975), Michigan (Brinner and Clotfelter 1975), Maryland (Clotfelter 1979), California (Clotfelter and Cook 1987), Canada (Livernois 1987; Vaillancourt and Grignon 1988), Illinois (Borg and Mason 1988), Colorado (Hansen 1995), and Texas (Price and Novak 2000).

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Summary of "Jockeying for Position: High School Student Mobility and Texas' Top-Ten Percent Rule"[1]

Julie Berry Cullen, Mark C. Long, and Randall Reback

Background

The debate over whether students' race should be factored into college admissions decisions has heated up during the past decade, culminating in the U.S. Supreme Court's recent decisions in the cases of two lawsuits against affirmative action admissions policies at the University of Michigan. Recently, the states of Washington, California, Texas, Florida, and Georgia banned race-based admissions in some or all of their public universities. Texas was the first state to do so. In 1996, the Court of Appeals for the Fifth Circuit ruled in the case of *Hopwood v. Texas* that the University of Texas Law School could not take race into consideration in admitting students unless such action was necessary to remedy past discrimination by the school itself. After this ruling, Texas ended racial preferences at all state colleges and universities. In response to mounting public concern regarding falling minority matriculation to elite Texas public universities,[2] then Governor George W. Bush helped push through legislation guaranteeing that all high school seniors with grades in the top-10 percent of their high school class gain admission to any public university within Texas. The Texas program began in the summer of 1998 and, since then, California and Florida have adopted similar plans.

These x-percent plans potentially improve access to higher education for disadvantaged students by using a school-specific standard. The admission guarantee ensures that students at low-achieving high schools, who tend to be disproportionately poor and minority, are equally represented among those automatically granted access to public universities. However, these policies may also lead to behavioral responses that alter the composition of students at these schools. For example, consider a student who would have attended a given high school and placed below the top-10 percent in the absence of the reform. With the reform in place, this student might be able to obtain guaranteed access to a premier university by raising his or her grade point average without changing high schools. Alternatively, the student could choose to attend (or transfer to) another high school with lower-achieving peers where he or she would be more certain to fall into the top-10 percent.

The fact that such policies change the relative attractiveness of schools could therefore have unintended positive and negative consequences. If relatively able or advantaged students are more likely to attend previously undesirable schools as a result, then these transfers would reduce stratification and might generate positive spillovers to students in the recipient schools through peer effects. At the same time, this enrollment response might skew access to higher education to those students with otherwise better outside opportunities. In particular, it may squeeze out some of the automatic admissions slots that would have gone to disadvantaged and minority students. In this research, we do not address these broader welfare implications but instead attempt to detect and quantify any high school attendance response to the new admissions program in Texas.

Data and Descriptive Findings

The primary data source for our analysis is individual-level Texas Assessment of Academic Skills (TAAS) test score data collected by the Texas Education Agency (TEA).[3] In the spring of each year, students are tested in reading and math in grades 3-8 and 10. The student-level test score reports are available for the years 1993 through 2000. TEA provided us with versions of these data that assign each student a unique identification number, allowing us to track the same student across years, as long as the student remains within the Texas public school system. We use the student's reading and math scores in the 8th grade to predict his or her high school class rank and statewide rank, and the student's 10th grade data to identify the actual high school attended.

An important aspect of our data is that the latest that we can observe students in their high school careers is in the 10th grade. We are, therefore, unable to explore whether there are opportunistic transfers in the final years of high school. What we refer to as "strategic mobility" represents changes in student high school attendance patterns that reflect that some lower-achieving schools have become newly attractive due to the possibility of offering students top-10 percent positions. These mobility responses do not necessarily reflect gaming-of-the-system.

We begin our analysis by testing some straightforward predictions for how this kind of strategic mobility would affect the distribution of academic ability of students in the top-10 percent of their class. If strategic mobility occurred in response to the new policy, then the average ability of top-10 percent students would increase, since this type of behavior involves higher achieving students displacing other students from the top decile of the high school class. As predicted, Figure 1 shows an increase in the average ability level of 10th-grade students in the top-10 percent of their high school class after the policy was introduced in 1998. In the three years before the policy was introduced, students who were in the top-10 percent of their high school were, on average, at the 92.5 percentile of the state test score distribution. This average ability level jumped up to the 92.8 percentile in each of the three years after the policy was introduced.

"These x-percent plans potentially improve access to higher education for disadvantaged students by using a school-specific standard...However, these policies may also lead to behavioral responses that alter the composition of students at these schools...[and] could therefore have unintended positive and negative consequences...."

Figure 1
Average Student in Top-10 Percent of Own High School

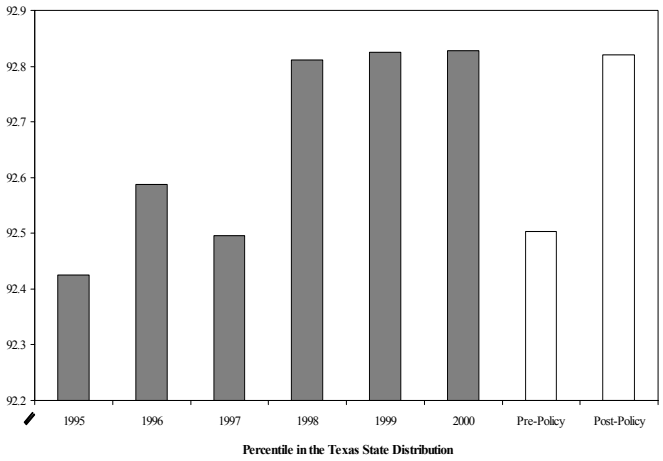
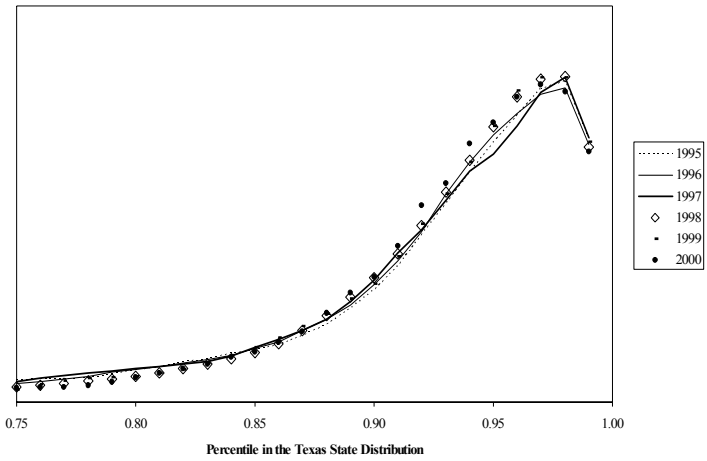


Figure 2 examines this distributional shift in more detail. Here we show the share of students who are in the top-10 percent of their high school class by position in the statewide ability distribution. If strategic mobility is occurring, we would expect to see an increase in the share of automatic admissions slots being taken by students in the top of the state distribution and a lower share of automatic slots remaining for students in the lower ranges. This pattern is clearly observed in the data. Shares for students above the 86th percentile increased, while students below this level were less likely to be in the group eligible for automatic admission after the policy was introduced. Furthermore, there was no evidence of a pre-policy trend, as can be seen in comparing the distributions in 1995, 1996, and 1997.

In a regression framework, the post-policy shifts shown in both figures are found to be significant (even controlling for pre-existing campus-specific time trends). These patterns are certainly consistent with the anticipated attendance response. The remainder of the analysis explores whether these patterns are in fact driven by underlying changes in the schooling choices that students make.

Figure 2
Share of Students in the Top-10 Percent of Own High School Class, 1995 to 2000



Analysis of Students' Transitions to High School

Our student-level tests of strategic mobility track students' movements between 8th grade in junior high schools and 10th grade in high schools. Cohorts that made this transition before 1998 selected high schools under the prior admissions regime. For those transitioning in 1998 and later, anticipated class ranks would be expected to feature more prominently in the decision of where to attend school. To test for a policy impact, we compare the high school attendance patterns of similar students from the same middle school in the years before and after the policy change using two distinct strategies.

For the first test, we explore whether 8th-graders with the highest motives and scope for strategic mobility are relatively more likely to attend high schools with lower top-10 percent thresholds after the reform. In other words, we would expect such students to attend lower quality schools. The 10th-grade threshold for each high school is determined by the 8th-grade scores of the students who choose to attend. A student will be motivated to respond to the new policy if s/he is likely to apply to (and be rejected by) a selective public university. We impute these measures of motivation using the application and admissions decisions of Texas students in the National Educational Longitudinal Study. Secondly, we compute the student's opportunity to behave strategically by determining if there is a nearby high school where the student would be in the top-10 percent and not have to sacrifice too much in terms of median peer achievement.

For the second test, we define an "on-track" high school for each junior high school in the state, based on pre-policy junior high school to high school transition patterns. After the policy change, students who expect to place in the top-10 percent at the on-track high school should be more likely to attend their on-track high school. Students who do not expect to place in the top-10 percent at the on-track high school should be more likely to either transfer or move residences, in order to attend an "off-track" high school where they have the opportunity to qualify. We further test whether this decision is enhanced for students with strong incentives.

Under both of these approaches, the results from the student-level regressions uncover evidence of strategic mobility among the students with both motive and opportunity. The purposeful reallocation of students across schools is apparently large enough to explain the decline in ability segregation observed in the aggregate descriptive statistics.

Implications and Conclusions

Even prior to the policy change, non-minority and non-poor students were disproportionately represented among students in the top-10 percent of their high school class. According to our estimates, strategic behavior after the policy change increased these disparities: White and non-poor students have increased their rate of movement into schools where they would be in the top-10 percent relative to other groups of students. These responses will reduce the

effectiveness of the policy in raising minority enrollment in Texas's flagship public universities. On the other hand, this student movement will reduce disparities in peer quality across schools. Whether the benefit of widely distributing high ability students across schools is greater than the adverse effect on the composition of students receiving automatic admission is difficult to determine. Nonetheless, these unintended responses and their consequences should be considered in evaluating the success or failure of the new policies.

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[1] An early draft was presented at the NBER Higher Education Meeting in May 2003 and can be accessed at http://home.gwu.edu/~marklong/Jockeying%20For%20Position.pdf. A revised version is available upon request from the authors.

[2] Bucks (2003) reports that the proportion of first-time student enrollments of blacks and Hispanics at the University of Texas at Austin was 4.1 percent and 14.5 percent, respectively, for the 1996-1997 school year, but declined to 2.7 percent and 12.6 percent for the 1997-1998 school year. At Texas A&M, the proportion of blacks dropped from 3.7 percent to 2.9 percent and the proportion of Hispanics dropped from 11.3 percent to 9.6 percent. (Brian Bucks, 2003, "The Effects of Texas' Top Ten Percent Program on College Choice," http://www.utdallas.edu/research/greenctr/papers/pdfpapers/paper34.pdf).

[3] We would like to thank the Texas Education Agency for access to the individual-level longitudinal student data and the National Center for Education Statistics for access to the restricted-use version of the National Education Longitudinal Study (NELS).

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October 22. "Does Welfare Participation Affect Women's Wages?" **Mary Noonan**, Assistant Professor, Department of Sociology, University of Iowa

November 14. "Domestic Violence, Employment and Divorce." **Audra Bowlus**, Associate Professor, Department of Economics, University of Western Ontario

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March 25-26, TBA. **Robert Moffitt**, Professor of Economics, Johns Hopkins University—Visiting Scholar

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Janet Bronstein, Professor, Department of Health Care Organization and Policy, University of Alabama–Birmingham

Jacob Vigdor, Assistant Professor of Public Policy and Economics, Sanford Institute of Public Policy, Duke University

April 23, 2:00 to 3:30 p.m., 18th Floor of Patterson Office Tower, University of Kentucky, **Sheldon Danziger**, Henry J. Meyer Collegiate Professor of Public Policy and Co-Director of the National Poverty Center, University of Michigan

KERA and the Implications for Funding and Achievement Gaps

William Hoyt and Sheila Murray

In 1989 the Kentucky Supreme Court ruled in *Rose v. The Council for Better Education, Inc.* that the entire state education system—governance, curriculum, and finance—was unconstitutional. The court instructed the state to create an "efficient system of common schools," one that had "substantial uniformity, substantial equality of financial resources and substantial equal educational opportunity for all students." In response, the state passed the Kentucky Education Reform Act of 1990 (KERA), which completely overhauled the financing, organization, and curriculum of K-12 education. *Rose* has been an influential case, inspiring courts in other states to go well beyond equality in spending and instead focus on ensuring that all students have equitable access to adequate educational opportunities.[1]

Background and Overview of Landmark Decision in State Education Reform

Prior to KERA, Kentucky ranked in the lowest 25 percent of states on almost every indicator of educational quality. High school completion rates in Kentucky were consistently the lowest in the nation with only 68 percent of ninth graders graduating from high school in four years. In a national survey of functional literacy, Kentucky residents were among the lowest; about half of the population in remote Appalachian counties was functionally illiterate (Trimble and Forsaith 1995).

Prior to KERA, the property tax was the primary local revenue source for Kentucky school districts. Because of the wide variation in districts' fiscal capacities (for example, in the year prior to *Rose* local property values ranged from $29,807 to $244,305 per pupil), local spending per pupil varied widely. While the Commonwealth implemented a power equalization program as well as other state aid programs in an attempt to equalize the disparities in local fiscal capacities, these programs had only limited success. This was due, in part, to many school districts' unwillingness to tax themselves.[2] Figure 1a maps Kentucky school districts' current spending per pupil in the 1988-1989 academic year relative to the state mean. There was significant variation in spending across the state with generally much lower spending in eastern Kentucky's poorer Appalachian counties.

While KERA increased average spending on education, at issue in the original lawsuit was the equity in spending. Here, too, KERA had dramatic effects. Flanagan and Murray (2003) find that across all measures, inequality has fallen sharply since the passage of KERA. For example, the Gini coefficient fell from 0.09 in 1987 to 0.069 two years after the start of the finance reforms.[3] By 1992, however, the reduction in inequality began to taper off: the reductions between 1992 and 1997 were significantly smaller than those immediately following implementation. Figure 1b maps current spending per student and district for 1999 to 2000, as Figure 1a did for 1988 to 1989. A comparison of the maps indicates significant changes in educational spending patterns in Kentucky. In particular, districts in eastern Kentucky that were spending far below the state average prior to KERA are now spending at or, in some cases, significantly above the average.

Figure 1a

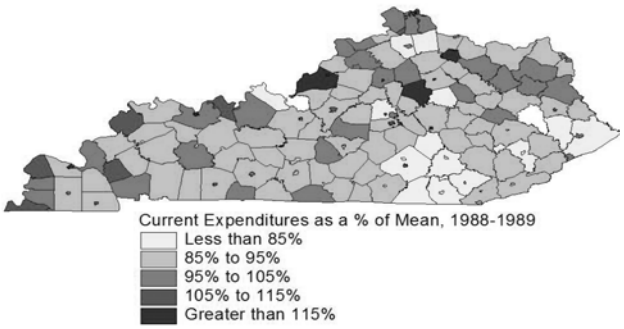
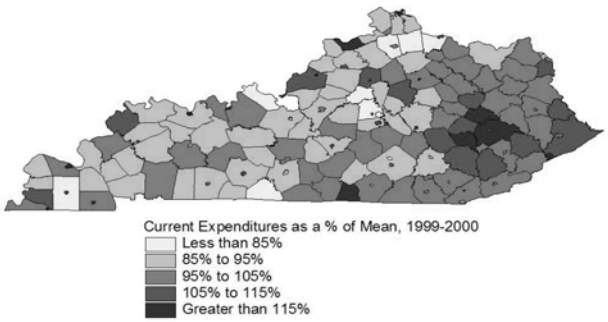


Figure 1b



KERA and Educational Outcomes

The accountability system broke new ground by establishing financial rewards and sanctions for schools on the basis of changes in a single accountability index determined by combining educational achievement assessments with a variety of non-cognitive indicators such as the school's attendance, dropout and retention rates, and post-graduation experiences. Large gains in scores on the first assessment system (KIRIS) reported early on were questioned by education researchers who suggested the gains were inflated because teachers tailored their teaching too closely to the assessments and students focused unduly on the specific content of the tests rather than the broad domains of achievement the tests are intended to represent (Koretz and Baron 1998).

Further, the new system was widely criticized because it contained no standardized national test and therefore the results of the assessments could not be externally validated. In 1998 the state incorporated a new assessment system into the accountability system, now called the Commonwealth Accountability Testing System (CATS), which includes a standardized test—the Comprehensive Test of Basic Skills (CTBS/5) for reading, language arts and mathematics in grades 3, 6, and 9. The accountability system averages the school-level performance in the assessments with an index of non-cognitive skills to determine a single accountability measure. Scores on the accountability index are reported annually, but schools are formally evaluated on the basis of changes over a two-year period. Each school is assigned a performance target. Schools that exceed their targets are given cash rewards. Those that fall below the target are provided improvement funds and are subject to oversight through a "distinguished educator."

Given that the court ordered both efficiency and equity in educational performance, a critique of the effectiveness of KERA merits an examination of the distribution of measured performance on achievement tests within districts in Kentucky. Figure 2a maps the mean district score for the third grade total battery (all tests) for the CTBS/4 given to Kentucky students in 1990. These scores are reported relative to the mean state score. Again, as with school finances, there was significant variation in student scores. A more recent version of the CTBS, the CTBS/5, has been given as part of the CATS assessment. Analogous to Figure 2a, Figure 2b gives the third grade total battery test scores for 2002. In stark contrast to the maps of the relative finances pre- and post-KERA (figures 1a and b), there is virtually no change to the geographic distribution of test scores from 1990 to 2002. Measures of inequality in the distribution of test scores can also be determined. We find that the Gini coefficient for the CTBS/4 (third grade) in 1990 was 0.055; for the CTBS/5 in 2002 it increased to 0.058, a decrease in equality by this measure. Similar results occur when scores for other grades or scores on the components of the exam (reading, language arts, math, spelling, study skills) are examined.

Figure 2a

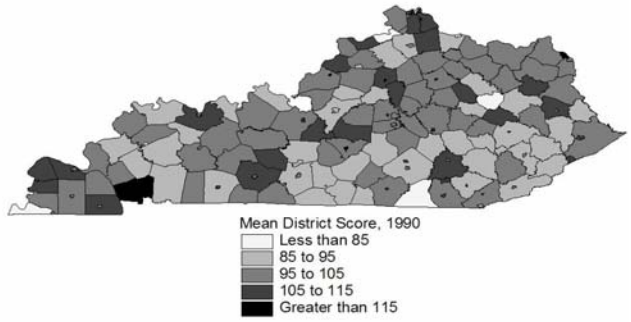
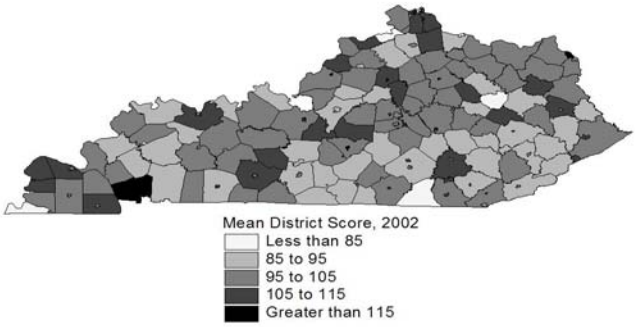


Figure 2b



Achieving "efficiency" in education is probably best interpreted, at least for measurement purposes, as increasing performance in Kentucky in both absolute terms and relative to the rest of the nation. Table 1 reports the average scores for the National Assessment of Educational Progress (NAEP) exam for fourth graders in reading and mathematics. From 1992 to 1998, reading scores for Kentucky students increased by 2.3 percent while national scores remained flat. In contrast, while Kentucky scores in mathematics rose by 2.8 percent from 1992 to 2000, the national scores rose by 3.2 percent. Comparing scores for the CTBS, in 1990 the Kentucky mean for CTBS/4 total battery (index for all tests) for third graders was 52.6, compared to the national mean of 50. In 2002, the Kentucky CTBS/5 score was 55.6—an increase of 5.7 percent. (However, the score of 49.8 in spring 1998 suggests a relative decrease from 1990.)

Of course, it is erroneous to attribute all changes, or lack of changes or convergence in measured achievement to KERA, as numerous other factors contribute to determination of achievement. Recent studies that attempt to isolate the impact of KERA on achievement include Murray and Flanagan (2003), who find some evidence that KERA had a positive impact on third grade CTBS reading and math scores. However, in another recent study, Clark (2002) finds that school spending associated with KERA had no significant impact on ACT scores relative to Tennessee, which had a relatively stable education finance system during the 1990s.

KERA and the Achievement Gap

What KERA did not address or attempt to monitor were differences in finances or educational outcomes by race. In fact, KERA appears to have had the effect of decreasing funding of districts in which the majority of African-American students attend school in Kentucky. Relative spending per student in the Jefferson County (Louisville) school district, where almost 48 percent of all African-American students in Kentucky attend school, and in the Fayette County (Lexington) school district, with 12 percent of Kentucky's African-American students, fell 21 percent, from 135 percent of the average in 1988-1989 to 114 percent in 1999-2000. That relative funding in the two districts in which almost 60 percent of African-American students attend school has decreased is due to the fact that Jefferson and Fayette are wealthy districts with relatively high spending per student before KERA. Further, while assessment for KERA occurs at the school level, finances, with the exception of assessment-based awards, are determined at the district level. Neither race nor the existence of any achievement gap between race groups has a direct role in the determination of state funds under KERA.

Only in 2000 were results of student achievement measures reported by race. The lack of data on achievement by race from early assessment testing from KERA or CTBS testing from a pre-KERA period makes it difficult to examine KERA's impact on the achievement gap.

Analysis of results from the NAEP offers some insights, though the NAEP is not representative of school districts, and its results are not available at the school district level. Table 1 lists the state-level results for the average 4th grade reading and math NAEP scores for Kentucky and the rest of the nation for both white and African-American students. Reading scores are available for 1992, 1998, and 2002, and math scores are available for 1992, 1996, and 2000. Regarding the achievement gap, the results might be considered mixed for Kentucky. They suggest that the gap is not as large for Kentucky as for other states, with white Kentucky students scoring slightly below the national mean for white students and with black students scoring above the national mean for black students in most years. However, while the gap between both reading and math scores appears to be shrinking for the nation, the gap has slightly increased in Kentucky in the past ten years. Whether the increase in the black-white achievement gap is due to the reduced funding under KERA to school

2003-2004 Emerging Scholars Program

The UK Center for Poverty Research is pleased to announce the following participants in the Emerging Scholars Program:

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Ngina Chiteji, Assistant Professor, Department of Economics, Skidmore College.

> ***"So far, it appears that KERA has made little headway in achieving equity in educational outcomes, at least as measured by performance on achievement tests."***

districts like Jefferson and Fayette cannot be determined with this data.

Final Remarks

KERA appears to have succeeded in meeting the goal of funding equity, effectively severing links between district property wealth and income and spending per student. Results on the "efficiency" of education, as measured by increases in Kentucky student performance on student achievement tests, is more mixed. So far, it appears that KERA has made little headway in achieving equity in educational outcomes, at least as measured by performance on achievement tests.

[1] For example, the New Hampshire State Supreme looked to the Kentucky case for "... establishing general, aspirational guidelines for defining educational adequacy." (See *Claremont School District et al. v. Governor et al.*, 1997.) The Ohio State Supreme Court also cites KERA as a guideline. (See 95-2006 *DeRolph v. State*, first concurring opinion.)

[2] Local revenues were also very low because tax assessments were very low and in 1965 the state enacted rollback laws to limit property tax rates.

[3] See Berne and Stiefel (1984) for a thorough discussion of the properties of measures of equity in public school resources.

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Table 1
NAEP, 4th Grade Reading Scale Scores

	1992	1998, Accom-modations	2002, Accom-modations	Percent change, 1998 to 2002, Accommodations
		All students		
Kentucky	213	218	219	0.5%
Nation	215	213	217	1.9%
Percent of Nation	99.1%	102.3%	100.9%	
		White students		
Kentucky	214	220	222	0.9%
Nation	223	223	227	1.8%
Percent of Nation	96.0%	98.7%	97.8%	
		Black Students		
Kentucky	196	199	199	0.0%
Nation	191	192	198	3.1%
Percent of Nation	102.6%	103.6%	100.5%	
Gap, Kentucky	-18	-21	-23	9.5%
	-8.4%	-9.5%	-10.4%	
Gap, Nation	-32	-31	-29	
	-14.3%	-13.9%	-12.8%	

NAEP, 4th Grade Math Scale Scores

	1992	1996	2000	Percent change
		All students		
Kentucky	215	220	221	2.80%
Nation	219	222	226	3.20%
Percent of Nation	98.20%	99.10%	97.80%	
		White students		
Kentucky	217	223	225	3.70%
Nation	227	231	235	3.50%
Percent of Nation	95.60%	96.50%	95.70%	
		Black students		
Kentucky	201	203	200	-0.50%
Nation	192	200	205	6.80%
Percent of Nation	104.70%	101.50%	97.60%	
Gap, Kentucky	-16	-20	-25	
	-7.40%	-9.00%	-11.10%	
Gap, Nation	-35	-31	-30	
	-15.40%	-13.40%	-12.80%	

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