

SCHOOL CHOICE

ISSUES

IN THE STATE



School Choice for North Carolina:

Many agree with the concept. Some disagree. And some simply want more information. As the public debate continues to grow louder about how best to provide a quality education to all North Carolina children, it is critical to know the facts about school choice, and to have an understanding of how school choice programs have had an impact on communities, parents and students around the country. All of this analysis is done with one goal in mind: The best possible education for all of North Carolina's children.

The High Cost of Low Graduation Rates in North Carolina

Prepared By:

Brian J. Gottlob

Senior Fellow

Milton and Rose D. Friedman Foundation

October 2007

A MESSAGE FROM THE FRIEDMAN FOUNDATION:

OUR CHALLENGE TO YOU

Our research adheres to the highest standards of scientific rigor. We know that one reason the school choice movement has achieved such great success is because the empirical evidence really does show that school choice works. More and more people are dropping their opposition to school choice as they become familiar with the large body of high-quality scientific studies that supports it. Having racked up a steady record of success through good science, why would we sabotage our credibility with junk science?

This is our answer to those who say we can't produce credible research because we aren't neutral about school choice. Some people think that good science can only be produced by researchers who have no opinions about the things they study. Like robots, these neutral researchers are supposed to carry out their analyses without actually thinking or caring about the subjects they study.

But what's the point of doing science in the first place if we're never allowed to come to any conclusions? Why would we want to stay neutral when some policies are solidly proven to work, and others are proven to fail?

That's why it's foolish to dismiss all the studies showing that school choice works on grounds that they were conducted by researchers who think that school choice works. If we take that approach, we would have to dismiss all the studies showing that smoking causes cancer, because all of them were conducted by researchers who think that smoking causes cancer. We would end up rejecting all science across the board.

The sensible approach is to accept studies that follow sound scientific methods, and reject those that don't. Science produces reliable empirical information, not because scientists are devoid of opinions and motives, but because the rigorous procedural rules of science prevent the researchers' opinions and motives from determining their results. If research adheres to scientific standards, its results can be relied upon no matter who conducted it. If not, then the biases of the researcher do become relevant, because lack of scientific rigor opens the door for those biases to affect the results.

So if you're skeptical about our research on school choice, this is our challenge to you: prove us wrong. Judge our work by scientific standards and see how it measures up. If you can find anything in our work that doesn't follow sound empirical methods, by all means say so. We welcome any and all scientific critique of our work. But if you can't find anything scientifically wrong with it, don't complain that our findings can't be true just because we're not neutral. That may make a good sound bite, but what lurks behind it is a flat rejection of science.

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Educational
Choice



Executive Summary

North Carolina has a dropout crisis—only two thirds of North Carolina high school students graduate. One reason this crisis has not received the attention it deserves is because the state was reporting badly inflated graduation rates (supposedly as high as 97 percent) until it finally adopted a more realistic reporting method earlier this year. This study documents the public costs of high school dropouts in North Carolina and examines how school choice could provide large public benefits by increasing graduation rates in North Carolina public schools. It calculates the annual cost of high school dropouts in North Carolina caused by lower tax revenue, higher Medicaid costs and higher incarceration costs. It then examines how competition from private schools raises public school graduation rates, and calculates the dollar value of the savings to taxpayers that would follow from increasing North Carolina's public school graduation rates by enacting even a modest school choice program.

Key findings include:

North Carolina spends about as much on dropouts each year after they leave school as it spent when they were in school

- Of all students who start high school in North Carolina, only two thirds graduate; the other one third drop out. More than 38,135 North Carolina students in the class of 2005 failed to graduate.
- The annual public costs associated with just one year's class of dropouts is \$169 million, or about \$4,437 per dropout.
- Over an expected lifetime of 50 years, one year's class of dropouts will cost North Carolina taxpayers \$8.5 billion.
- The figures above include costs from only three sources: lost revenue from taxes and fees (\$995 per dropout per year), increased Medicaid costs (\$1,496 per dropout per year) and increased incarceration costs (\$1,946 per dropout per year). Since dropouts also incur many other public costs, the true public cost of dropouts is larger than \$4,437 per dropout per year.
- The state portion of school funding in North Carolina (not including local and federal funding sources) is about \$4,887 per pupil. This means the state is spending about as much on dropouts each year after they leave school as it spent when they were in school.

School choice improves public school graduation rates and produces millions in public savings

- Nationwide, research has shown that school districts with more students in private schools have higher public school graduation rates. If North Carolina families had expanded educational options, all North Carolina children would benefit from improved graduation rates in public schools.
- The beneficial effect of private school competition on public schools is large enough that even a modest school choice program, one that increased private school enrollment by fewer than 4 percentage points, would reduce the number of public school dropouts in North Carolina by up to 5,483 students per year, saving taxpayers up to \$24 million every year for each class of dropouts.
- The total savings from preventing these students from dropping out, over an expected lifetime of 50 years, would be up to \$1.2 billion.

About the Author

Brian J. Gottlob (bgottlob@poleconresearch.com) is the Principal of PoEcon Research. For 17 years Gottlob has analyzed economic, demographic, labor market industry and public policy trends for private sector, government and not-for-profit organizations. He has extensive experience in developing econometric models and has completed studies on range of economic, tax policy, energy, education, and health care issues in the States of New Hampshire, Virginia, Ohio, New Mexico, New York, Texas, Oregon, Michigan, Georgia, Mississippi, West Virginia and Illinois. Gottlob is a Senior Fellow at the Milton and Rose D. Friedman Foundation. He has been an instructor at the Whittemore School of Business and Economics at the University New Hampshire, a member of the Advisory Board of the New England Economic Partnership (NEEP) and a member of the National Association of Business Economics. Prior to founding PoEcon, Gottlob was a Vice President for Fiscal and Economic Policy at the Business and Industry Association of New Hampshire. He has an undergraduate degree in economics from the State University of New York and a graduate degree in public policy analysis from the University of New Hampshire.

About the Milton and Rose D. Friedman Foundation

MILTON & ROSE D. FRIEDMAN
FOUNDATION

Educational
Choice

The Milton and Rose D. Friedman Foundation, dubbed “the nation’s leading voucher advocates” by the Wall Street Journal, is a non-profit organization established in 1996. The origins of the foundation lie in the Friedmans’ long-standing concern about the serious deficiencies in America’s elementary and secondary public schools. The best way to improve the quality of education, they believe, is to enable all parents with the freedom to choose the schools that their children attend. The Friedman Foundation builds upon this vision, clarifies its meaning to the public and amplifies the national call for true education reform through school choice.

About Parents for Educational Freedom in North Carolina



Parents for Educational Freedom in North Carolina (PEFNC) is a 501(c)(3) nonprofit organization that is committed to empowering North Carolina parents through choice in education. Consisting of a diverse group of leaders and supporters, PEFNC is working to bring this fundamental change to our state by creating greater awareness of the need for parental choice; educating the public and policymakers about the benefits of greater parental choice; serving as a resource for school choice information; and building diverse partnerships to support expanding educational options for North Carolina families. Although PEFNC supports all programs that provide families with greater educational options, the organization is especially focused on educational options currently unavailable in North Carolina, including the opportunity for parents to educate their children nontraditionally and/or privately through the use of various educational scholarship programs.

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Foreword

Since the founding of our organization, Parents for Educational Freedom in North Carolina has been working to inform parents and opinion leaders on the need for more and better educational options. Along the way, we have been sounding the alarm, alerting citizens to the major problems we believe exist in our current system of K-12 education.

We are in a state of educational crisis regarding high school dropouts. The verifiable truth is that what we used to believe was a large majority of students graduating from high school in our state is now not much more than half. For some, this may come as a big surprise, particularly due to the reluctance of the Department of Public Instruction to report accurate graduation rates until only recently.

As a result, we felt we were discussing this problem in a data vacuum, and that's why quantifying the crisis was a top priority for PEFNC.

Undoubtedly and predictably, some will take issue with the solution proposed in this study – greater parental school choice—but the numbers paint a clear picture of the problem. Not only do we now know the extent to which dropouts suffer personal costs, we also know that this has a very real cost for every taxpayer in the state - \$169 million annually just for the dropouts in 2005.

PEFNC did not commission this study only to bring attention to yet another problem within our public school system, as we are working every day to change these numbers. But now that we know, PEFNC is motivated to work even harder to spread a message that is resonating with thousands across our great state. That message is freedom—freedom for parents to choose the education that best meets the needs of their children, and freedom for parents to give their children all the tools necessary to succeed in life.

In talking with thousands of parents across the state, we know things are not working for many of them, and that more options could address their needs. This study shows how parental school choice could play an effective and immediate role in addressing this crisis head on, even improving graduation rates in public schools where most families will choose to educate their children. We simply cannot afford to ignore the urgency of the situation described in this report, nor should anyone else who reads it in good conscience.

The time is now to take bold steps in shifting our educational paradigm and opening the window of educational freedom for the families of North Carolina. This is why PEFNC felt compelled to commission this research.

—Darrell Allison, President
Parents for Educational Freedom in North Carolina

Introduction

Across the nation states are acknowledging a crisis in high school graduation rates. Reports by the Education Trust, the Urban Institute and the Editorial Projects in Education Research Center (EPERC), an independent research institution affiliated with the publishers of *Education Week*, have documented the crisis in high school graduation rates in North Carolina.¹

The individual consequences of not graduating from high school are large and well-documented, but there also are substantial public costs when individuals drop out. Individuals who do not graduate from high school contribute less to society and consume more public services, imposing costs on the public. Lower rates of labor-force participation, higher rates of unemployment among those who are in the labor force and lower wages and salaries for those employed all are consequences of the failure of many individuals to obtain a high school diploma. When individuals attain higher levels of education, there are associated public benefits in the form of lower use of public-assistance programs, better health, lower rates of incarceration and overall lower social-service expenditures. At the same time, higher educational attainment increases productivity, employment, economic growth, income and tax revenues.

Most school districts and states dramatically understate the number of students who leave school before obtaining a high school diploma. At the same time, few efforts have been made to calculate the costs of dropouts beyond the individual or private consequences that result from failure to obtain a high school diploma. Consequently, we have an incomplete assessment of the costs to society of high school dropouts and the public consequences of a failure to implement public education reforms that address the problem.

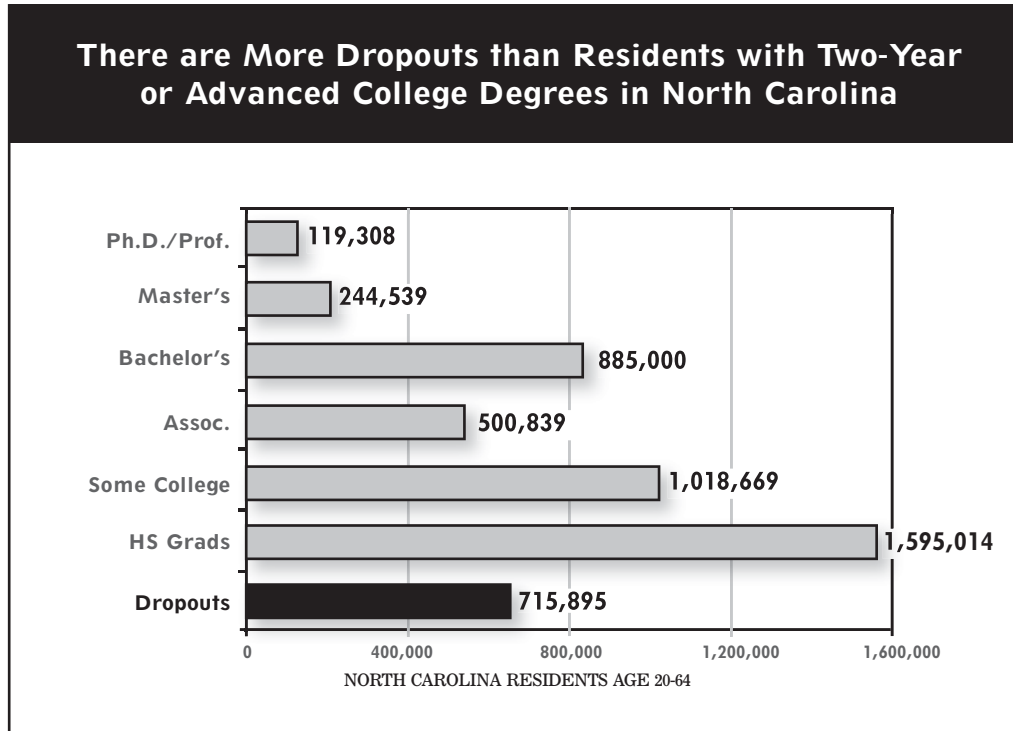
An understanding of public costs and benefits is fundamental to debates about education reform, but researchers rarely document these costs. Over the past two decades, citizens have supported higher spending on public schools and a myriad of reform initiatives because of the large private and public benefits they expect from improved educational outcomes.

This study addresses several critical education-reform issues. First, in estimating some of the public costs associated with a failure to graduate from high school, we provide perspective on the urgency of reform for North Carolina citizens and policymakers who may have little interest in education policy. Second, by documenting the costs associated with dropouts and calculating the likely impact that school choice will have on high school graduation rates, we clarify how school choice benefits are allocated. As evidence mounts that school choice increases the achievement of participating students, opponents of choice increasingly have argued that the benefits to those students are outweighed by the public costs of choice.² In response, a fundamental premise of the school choice movement is that increased competition will improve the quality of public schools and benefit students who remain in public schools as well as those who participate in choice programs. In this study, we expand the public-benefit calculation to include all citizens of North Carolina, not just those with children in schools.

The Size of the Dropout Problem in North Carolina

High school graduation is an important predictor of an individual's future economic success. It also is a key indicator of school district performance that sends a clear signal about the need for, or results of, education reform. Only 11 states have a higher percentage of their adult population lacking at least a high school diploma than North Carolina. Figure 1 shows the number of North Carolina residents aged 20-64 by educational attainment.³ The figure indicates that 715,895 adults ages 20 to 64 do not have a high school diploma.

Figure 1



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey March 2004-06 Supplement data for North Carolina

Most states and school districts significantly understate the problem of students failing to graduate from high school. Until recently, independent estimates by the EPERC, the Urban Institute and the National Center for Education Statistics of the U.S. Department of Education had noted the large discrepancy (as high as 33 percentage points) between North Carolina's official dropout rate and independent calculations of its dropout rate.⁴ These independent reviews all find similar errors in the official reported dropout and graduation data. The independent estimates of high school dropouts in North Carolina placed the state's overall graduation rate between 64 percent and 71 percent, rather than the then-official state rates of over 90 percent.⁵ North Carolina once listed graduation rates as high as 97 percent on reports required by the No Child Left Behind Act, prompting one national study to comment that "no administrator, policymaker or educator could, in good faith, report the kind of data North Carolina provided as an actual graduation rate."⁶

Beginning with the reporting of 2004-05 dropout data, the North Carolina Department of Public Instruction's dropout estimates were closer to - but still well below - independent estimates. That year North Carolina placed the graduation rate at about 80 percent, even while retention data reported by the state suggested a graduation rate of about 65 percent.⁷ Using the most detailed and thorough alternative estimates of dropout rates, those produced by the EPERC, we estimate that about 38,135 students in North Carolina left high school before obtaining a high school diploma, rather than the official reported number of 21,116.⁸ This figure puts the graduation rate at 66 percent.

For the group of students who should have graduated in 2005-06, North Carolina has further revised its method for calculating graduation rates. As this study was being prepared, new figures were released showing a graduation rate of 68 percent for this group.⁹ For the first time, the state's official graduation rate is in agreement with credible independent calculations. While the state is to be congratulated for finally reporting an accurate graduation rate, it is unfortunate that it has taken the state so long to own up to its dropout problem.

Dropouts Cost North Carolina Taxpayers Millions Every Year

For the 715,895 North Carolina residents ages 20 to 64 who lack at least a high school diploma, the consequences of dropping out are clear. Understanding that the same consequences face the more than 38,135 young people who did not graduate from high school in North Carolina in 2005 provides an indication of the public costs and benefits at stake for each year North Carolina fails to reform public education. Here we document the individual or private consequences of dropping out; later in this study we calculate some of the public costs.

Table 1

North Carolina Dropouts Have Much Worse Life Outcomes							
	Dropouts	HS Grads	Some College	Assoc. Degree	Bachelor's Degree	Master's Degree	Ph.D./ Prof.
% In Labor Force	65.3%	77.7%	78.2%	83.4%	84.2%	86.4%	89.2%
Unemployment Rate	10.6%	5.1%	4.5%	2.3%	2.0%	3.4%	0.5%
Annual Earnings (Age 20-64) ¹⁰	\$13,660	\$24,067	\$27,040	\$32,062	\$46,935	\$68,520	\$94,792
% on Medicaid or with Child on Medicaid	33.5%	20.2%	15.4%	11.5%	6.3%	6.9%	5.2%
Incarceration Rates (Males Only)*							
White	0.93%	0.39%	0.27%		0.08%		
Hispanic	2.00%	1.2%	NA		NA		
African-Americans	4.11%	2.35%	2.15%		0.75%		
						ALL COLLEGE GRADS COMBINED	

Source: U.S. Census Bureau, Current Population Survey, March Supplement 2004-06 and PoIEcon calculations.
 *Incarceration rates from U.S. Census as reported in E. Moretti (2005)¹¹ and PoIEcon Calculations.

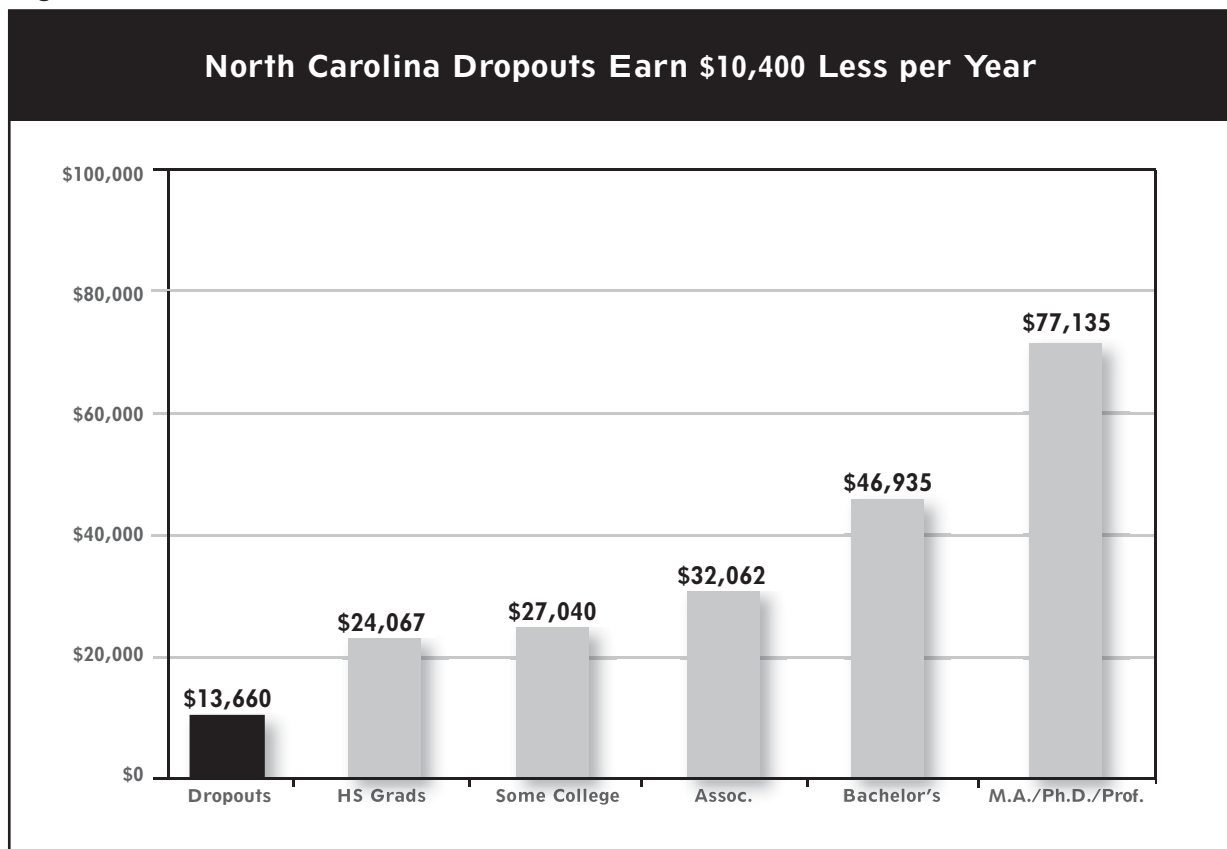
Table 1 shows how a few measures of public costs are affected by educational attainment in North Carolina. The table shows that North Carolina residents without a high school diploma are less likely to be in the labor force and those who are in the labor force are twice as likely to be unemployed than high school graduates. Dropouts earn far less on average than high school graduates, and are much more likely to receive, or to have a child who receives, Medicaid benefits. Finally, dropouts are more likely to be incarcerated than those with higher levels of educational attainment.

Dropouts Reduce Annual Earnings in North Carolina by \$7.5 Billion

The average annual earnings of dropouts are far lower than those of people who have received a high school diploma. Figure 2 shows the labor-market consequences of dropping out. The chart shows that working-age North Carolina dropouts earn, on average, about \$10,400 less than high school graduates.

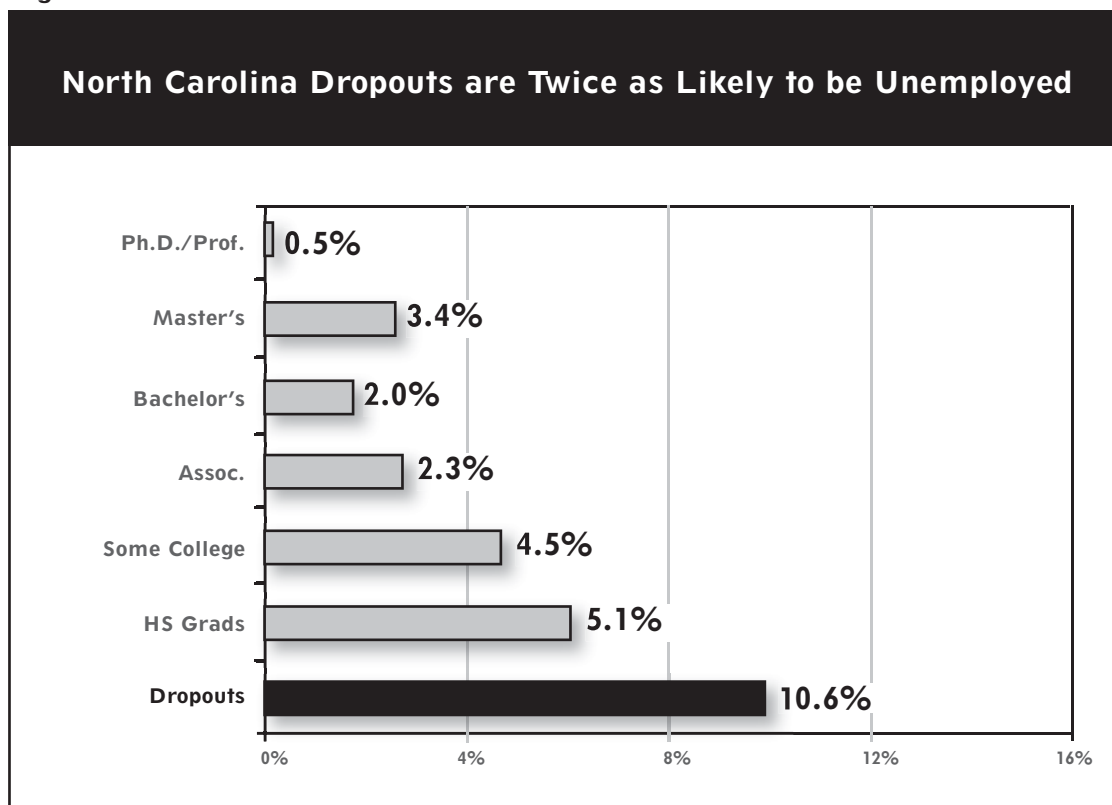
As Figure 3 shows, dropouts have much higher unemployment rates than individuals with at least a high school diploma. The average unemployment rate for North Carolina high school dropouts is more than 10 percent.

Figure 2



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey 2004-06 March Supplement data for North Carolina

Figure 3



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey March 2004, 2005, 2006 March 2005 data for North Carolina

Figures 2 and 3 depict the simple relationship between education and earnings as a result of lower-paying jobs, lower labor-force participation and lower employment rates of dropouts compared to graduates. However, because earnings also are a function of other factors, including age, experience and gender, we used regression analysis to more accurately estimate the relationship between education and earnings independent of the influences of those factors. We used a subset of North Carolina respondents to the March 2004-06 Current Population Survey (CPS) that included individuals ages 20-64 who have completed at least the ninth grade but who had not attended a postsecondary institution to determine the impact on earnings of a high school diploma and of each additional year of schooling completed. We found that, when the impacts of age, gender and race were removed, working high school graduates earned \$11,007 more on average than working high school dropouts.

The difference in annual earnings between dropouts and high school graduates implies that, if all of North Carolina’s residents of working age had obtained at least a high school diploma, total earnings in North Carolina in 2005 would have been \$7.5 billion higher (see Table 2).¹²

Table 2

North Carolina Dropouts Earn a Total of \$7.5 Billion Less per Year				
Education Level	Population	Average Earnings	Total Earnings	No Dropouts (All Become HS Grads)
Dropouts	715,895	\$13,660	\$9,779,268,879	\$0
HS Grads	1,595,014	\$24,067	\$38,386,723,434	\$55,615,953,630
Some College	1,018,669	\$27,040	\$27,544,911,627	\$27,544,911,627
Associate’s Degree	500,839	\$32,062	\$16,058,050,270	\$16,058,050,270
Bachelor’s Degree	885,000	\$46,935	\$41,537,121,000	\$41,537,121,000
M.A./Ph.D./Prof.	363,847	\$77,135	\$28,065,156,422	\$28,065,156,422
Total	5,079,264	\$29,473	\$161,371,231,631	\$168,821,192,948
			Difference	\$7,449,961,318

Dropouts Decrease State Tax Revenues by at Least \$712 Million Annually

Along with increased earnings by North Carolina residents, an increase in graduation rates would provide additional revenues for the state of North Carolina.

We used data on the average earnings of working-age North Carolina dropouts and high school graduates from the March CPS for 2004, 2005 and 2006 to calculate hypothetical tax liabilities using the “TAXSIM” models developed by the National Bureau of Economic Research. These include both federal and state-level models that estimate tax liabilities based on existing federal and state tax laws and marginal tax rates, including all available tax credits and exemptions. We had to make some simplifying assumptions in calculating tax liabilities. Most important, because we had no data on spousal income for the population of high school dropout taxpayers, we treated all taxpayers as if they were filing as single taxpayers. We calculated state tax liabilities for taxpayers with zero to three dependent child exemptions and weighted the number of returns according to the percentage of dropouts with and without dependent children, as indicated by CPS data. Because there are a number of additional tax deductions, exemptions

or credits that can apply to taxpayers age 65 and older, we limited our tax analysis to residents under the age of 65. The complexities of individual tax filings could not be captured when trying to model more than 715,000 tax returns of working-age dropouts, but our results provide a reasonable estimate that is likely to be within a few percentage points of the true income-tax cost associated with the earnings differential between high school graduates and dropouts.

The estimated North Carolina state income-tax liability for the eight combinations of taxpayers is presented in Table 3. The table shows that the lower earnings of North Carolina’s working-age dropouts result in state income-tax revenues that are \$465 million lower (or about \$649 lower per dropout) than they would be if all residents had attained a least a high school diploma. These figures represent just one source of lost revenue. The increased spending that an additional \$7.5 billion in earnings would generate would also produce more than \$248 million (or about \$346 per dropout) in additional state and local revenues such as sales-tax revenue. Combined, state income and sales tax revenue are reduced by an estimated \$713 million annually in 2005 dollars, or about \$995 for each of North Carolina’s 715,895 residents ages 20-64 who lack at least a high school diploma.

Table 3

Dropouts Reduce North Carolina Tax Revenue by \$712 Million Each Year					
	Total Income	2005 State Income Tax Liability			
		No Children	1 Child	2 Children	3 or More Children
HS Grads	\$24,067	\$1,172	\$897	\$622	\$364
Dropouts	\$13,660	\$489	\$239	\$0	\$0
Difference		\$683	\$658	\$622	\$364
X					
Dropouts (Age 20-64)		459,605	107,384	102,373	45,817
Lost Income Tax Revenue		\$313,909,935	\$70,658,837	\$63,675,997	\$16,677,490
Total Lost Income Tax Revenue:					\$464,922,258
Other Lost Tax & Fee Revenue:					\$247,527,591
Total Annual Revenue Loss:					\$712,449,849

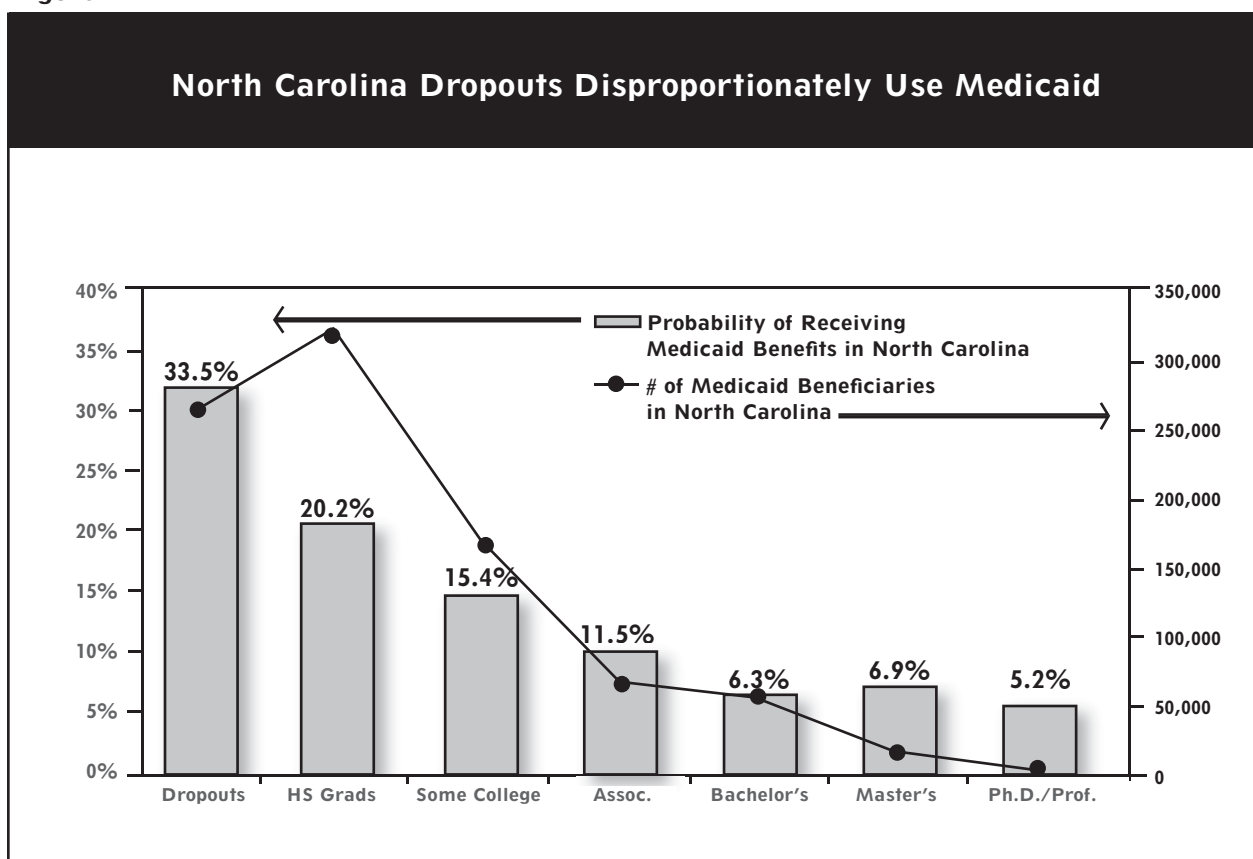
Dropouts are More Likely to Rely on Medicaid; Dropouts Increase North Carolina’s Medicaid Costs by \$155 Million Each Year

Individuals who fail to obtain at least a high school diploma are at a much greater risk of reliance on safety-net programs such as Medicaid, Temporary Assistance to Needy Families, housing assistance and food stamps. The probability of being a beneficiary of one or more public-assistance programs increases dramatically for individuals who do not have at least a high school diploma.

We focused on Medicaid to illustrate the impact of high school graduation on social safety-net expenditures in North Carolina. Medicaid is the largest and most costly safety-net program in North Carolina and across the country. Medicaid expenditures in North Carolina exceeded \$8.5 billion in 2005, of which more than \$3 billion were from state sources of revenue (not federal matching funds). Combined state and federal funds for Medicaid account for 25 percent of the total budget of the state of North Carolina in 2005, higher than the national average of 23 percent.¹³

The cost of Medicaid, which provides health care for low-income individuals, is shared by the state and federal governments, with the state of North Carolina paying 36 percent of the cost in 2005.¹⁴ About 17 percent of the North Carolina population, or almost 1.5 million residents of all ages, was enrolled in Medicaid benefit programs in 2003, placing the state just below the national average and in the middle of all states for the percentage of population enrolled in Medicaid.¹⁵ However, 44 percent of all births in North Carolina were to mothers receiving Medicaid benefits, higher than the 41 percent average for all states, according to the most recent data from the Vital Statistics Reports of the National Centers for Disease Control.¹⁶

Figure 4



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey March 2004-06 data for North Carolina

The probability that an individual in North Carolina will be a Medicaid beneficiary is strongly related to his or her educational attainment. As Figure 4 shows, individuals in North Carolina who do not have at least a high school diploma (14 percent of the working-age population) are about twice as likely to be on Medicaid. Figure 4 shows that, based on the March 2004-06 CPS, the probability that a high school dropout or a dependent child in North Carolina receives Medicaid benefits is nearly 34 percent. The probability drops to 20 percent for high school graduates and continues to decline as educational attainment increases.

The CPS is known to underestimate the number and percentage of public-assistance recipients because of limitations on the individuals included in its samples.¹⁷ It does highlight the relationship between educational attainment and public-assistance costs, but it will produce a low estimate of the cost of dropouts and the impacts of educational reform on public costs and benefits.

To estimate the Medicaid cost of dropouts, we compared the probability that a North Carolina high school dropout, or the dependent child of a dropout, would be on Medicaid to the probability for high school graduates (nearly 34 percent compared to 20 percent), and multiplied the difference in the number of expected Medicaid recipients

by the average cost per Medicaid recipient (not including elderly and disabled recipients or administrative costs).¹⁸ We first multiplied the estimated number of dropouts on Medicaid (from the CPS) by the average cost per Medicaid recipient. Then we estimated the number of dropouts who would be on Medicaid if, instead of leaving school, they had obtained high school diplomas. Table 4 presents estimated dropout-related Medicaid costs. We estimated that, if all North Carolina dropouts had received a high school diploma, there would be 95,607 fewer Medicaid recipients, saving the Medicaid program about \$427 million annually, including \$155 million in savings for the state of North Carolina. Because the CPS is known to underestimate the number of Medicaid recipients in the population, as noted above, and because we do not include elderly residents (among the most costly beneficiaries) in our calculations, these figures likely underestimate the actual cost of Medicaid related to dropouts in North Carolina.

Table 4

Higher Medicaid Use by Dropouts Costs North Carolina \$155 Million Each Year									
	Population	% On or w/ Child on Medicaid	# On or w/Child on Medicaid	Total Cost = Recipients x Average Cost	State Share of Costs	# on Medicaid if All Graduated	Total Cost = Recipients x Average Cost	State Share of Medicaid Costs	
Dropouts	715,895	33.5%	239,981	\$1,071,035,203	\$389,535,503	\$0	\$0	\$0	
HS Grads	1,595,014	20.2%	321,666	\$1,435,595,358	\$522,126,032	466,040	\$2,079,938,003	\$756,473,452	
Some College	1,018,669	15.4%	157,152	\$701,369,376	\$255,088,042	157,125	\$701,369,376	\$255,088,042	
Associate's Degree	500,839	11.5%	57,764	\$257,800,732	\$93,762,126	57,764	\$257,800,732	\$93,762,126	
Bachelor's Degree	885,000	6.3%	55,689	\$248,540,007	\$90,394,001	55,689	\$248,540,007	\$90,394,001	
Master's	244,539	6.9%	16,831	\$75,116,753	\$27,319,963	16,831	\$75,116,753	\$27,319,963	
Ph.D./Prof.	119,308	5.2%	6,168	\$27,527,784	\$10,011,855	6,168	\$27,527,784	\$10,011,855	
Total	5,079,264		855,251	\$3,816,985,213	\$1,388,237,522	759,644	\$3,390,292,655	\$1,233,049,438	
	Annual Medicaid Cost of Dropouts						95,607	\$426,692,558	\$155,188,084

North Carolina Dropouts Are Twice as Likely to Be Incarcerated; Each Class of Dropouts Costs an Extra \$6 Million Every Year

North Carolina spent almost \$1.1 billion on its correctional system in 2005, of which 87 percent came from state general funds.¹⁹ The cost to house each prisoner (not including administrative costs of the prison system) averaged \$63.56 a day or about \$23,000 a year in 2005.²⁰

Although the chance that any one individual will be incarcerated is small, the probability is more than twice as high for a North Carolina high school dropout as it is for a North Carolina high school graduate. Our estimates of the incarceration costs associated with dropouts rely on differences in the probability that individuals with different levels of educational attainment will be incarcerated in any one year. Because males account for the vast majority of incarceration costs, we calculated the impact of dropouts on incarceration costs using only male high school dropouts in North Carolina. Figure 5 shows the probability of white and African-American male dropouts being incarcerated in any one year during their lifetimes.

In calculating the impact on earnings and Medicaid, we relied on individual responses by North Carolina residents to monthly CPS surveys. For incarceration costs we had no direct individual measures of educational attainment, criminal activity and incarceration in North Carolina. Instead, we relied on the research of others for our estimates of the impact of dropouts on incarceration rates.²¹ We used those estimates to determine the likely number of North Carolina dropouts from each graduating class cohort who can be expected to be incarcerated any year during their working-age lifetimes. Then we used data on the type of crimes and the average length of sentences from the North Carolina Department of Correction to calculate a “weighted average sentence,” which is applied to each projected incarceration. The weighted average sentence was adjusted based on a weighted average figure for the percentage of sentence served, using statistics for each class of crime and sentence.²² The weighted average sentence served per incarceration was converted to days and multiplied by the daily cost of incarceration to arrive at an average cost per incarceration. This was then multiplied by the number of incarcerations to determine the incarceration costs for each year’s class of dropouts.

In addition, we multiplied the costs by 0.6 to account for recidivism, the tendency of prisoners to commit repeat offences and to be imprisoned more than one time during their lives, as well as for longer terms in subsequent incarcerations. Because many repeat offenders will have more than one additional incarceration, the estimates produced here are likely to be conservative. Adding the total cost of the first incarcerations to the cost of the recidivism gave us a total cost of incarceration for one year’s worth of dropouts. These cost calculations did not include any costs for policing or prosecuting or any administrative or capital costs of the prison system, nor did we factor in the costs of crime to victims, property loss or any of the other benefits associated with lower levels of crime.

Figure 5

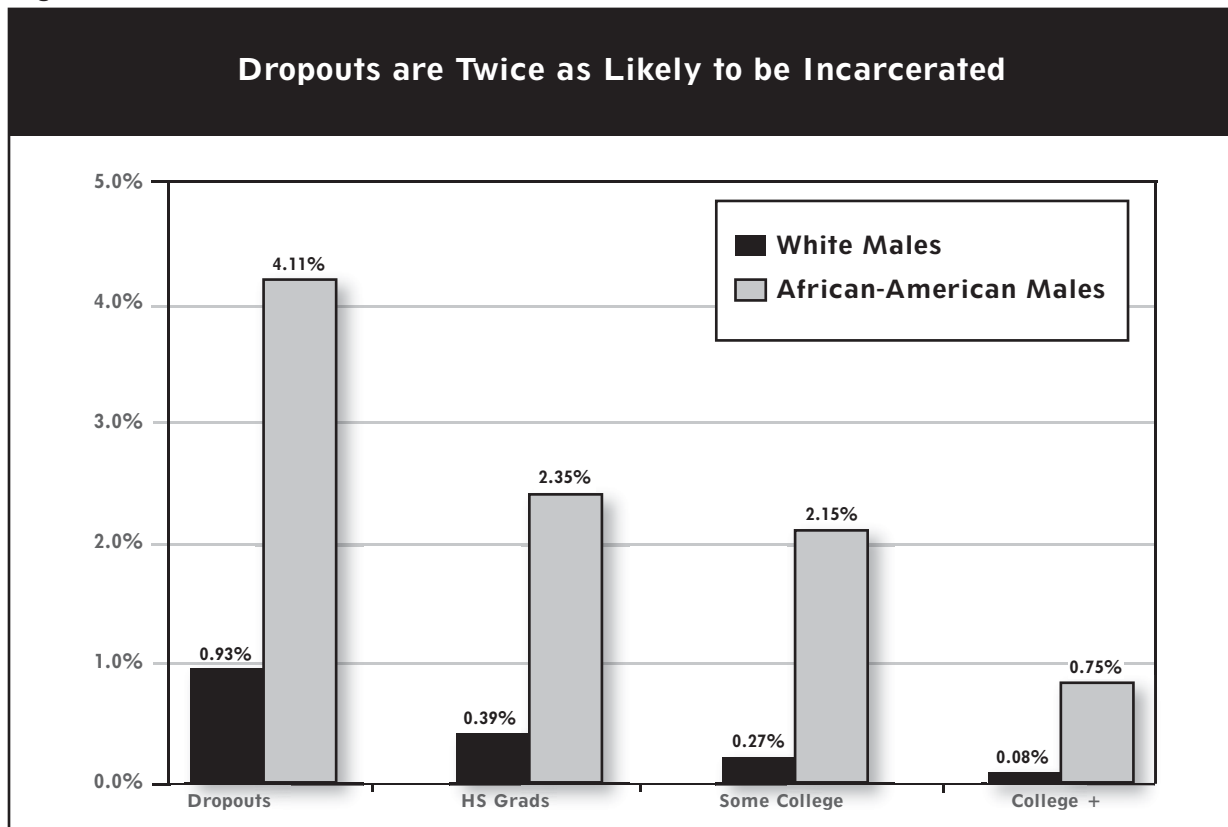


Table 5 presents our estimates of the impact that dropouts have on annual incarceration costs. We projected an expected number of incarcerations in a year for one graduating class based on the annual number of dropouts that year in the state of North Carolina. We then projected the number of incarcerations in any year that would be expected

to occur if all high school students graduated each year. The incarceration cost of dropouts is the difference between the costs associated with the expected number of incarcerations if there were no dropouts from the graduating class that year in North Carolina compared to the costs associated with the expected number of incarcerations for the actual number of dropouts. The table shows that the graduating class of 2005 was likely to produce 542 individuals who will be incarcerated in any one year during their lifetimes. The incarceration cost of this one class of dropouts is likely to be almost \$6 million in 2005 dollars each year over the lifetime of the dropouts. Eliminating dropouts in North Carolina would reduce the number of incarcerations of a graduating class by about 44 percent. We also divided the cost of one year of dropouts by the total number of dropouts to arrive at an average incarceration cost per dropout.

Table 5

Each Class of North Carolina Dropouts Increases Annual Incarceration Costs by \$6 Million					
	2001	2002	2003	2004	2005
Total Graduates	63,014	65,681	69,568	71,853	74,691
Dropouts	32,173	33,535	35,520	36,686	38,135
Graduation Rate (All Races Combined)	66.2%				
African American <i>Male</i>	49.7%				
African American <i>Female</i>	65.9%				
Hispanic <i>Male</i>	47.0%				
Hispanic <i>Female</i>	55.0%				
White <i>Male</i>	68.5%				
White <i>Female</i>	71.9%				
Cohort African-American Dropouts	12,296	12,719	13,643	14,400	15,469
African-American Male Dropouts	7,643	7,996	8,513	9,230	9,891
Cohort Hispanic Dropouts	1,120	1,385	1,709	2,027	2,542
Hispanic Male Dropouts	672	864	1,049	1,261	1,553
Cohort White Dropouts	17,281	17,992	18,816	19,118	19,412
White Male Dropouts	9,638	10,133	10,538	10,750	10,899
Expected Incarcerations from Dropouts					
African-American	314	329	350	379	407
Hispanic	13	17	21	25	31
White	90	97	101	103	105
Total Incarcerations	417	443	472	508	542
Expected Incarcerations for Grads					
African-American	180	188	200	217	232
Hispanic	8	10	13	15	19
White	38	40	41	42	43
Reduction in Expected Incarcerations if Dropouts were Grads					
African-American	135	140	150	162	174
Hispanic	5	7	8	10	12
White	52	58	60	62	63
Total Reduction in Incarcerations	192	205	218	234	249
One-Year Incarceration Costs of Dropouts (\$millions)	\$4.02	\$4.42	\$4.81	\$5.29	\$5.77
Total Cost For Initial Incarceration (\$millions)	\$32.19	\$35.33	\$38.51	\$42.31	\$46.14
Recidivism Cost @ 0.6 Initial Costs (\$millions)	\$19.32	\$21.20	\$23.11	\$25.39	\$27.69
Community Supervision Costs	\$280,235	\$299,874	\$318,702	\$341,372	\$362,991
Total Incarceration Costs of Dropouts (\$millions)	\$51.79	\$56.83	\$61.94	\$68.04	\$74.19
Incarceration Cost per Dropout	\$1,610	\$1,695	\$1,744	\$1,855	\$1,946

North Carolina Spends About as Much Each Year on Dropouts After They Leave School as It Spends in State Aid When They Are Enrolled in School

Not every dropout creates state expenditures for Medicaid and incarceration. Some dropouts cost the state tens of thousands of dollars annually, while others may cost the state only some limited reductions in state income-tax revenue. Still others may cost nothing. To account for these differences, we spread the cost of one year's class of dropouts across the entire population of new dropouts in that year to arrive at an average cost per dropout.

The total annual costs of each additional dropout, averaged over the population of new dropouts each year, suggests that on average the state of North Carolina will continue to pay about as much for each dropout after he leaves school as it does in state education aid while he attended school. The annual costs of lost tax revenue, increased Medicaid use and increased incarcerations associated with just one year's class of dropouts (an estimated 38,135 in 2005) is at least \$169 million. These annual costs average about \$4,437 per dropout. Average state education aid (excluding local and federal funding sources) is about \$4,877 per pupil. What's more, because there are many other costs associated with dropouts not documented here, reduced earnings patterns follow graduates their entire lives, and incarceration and Medicaid are multi-year costs, it is reasonable to conclude that the public costs of North Carolina dropouts are substantially greater than our calculations indicate.

More importantly, North Carolina taxpayers will continue to pay for the state educational system's failures well into the future. Over their expected lifetimes of an additional 50 years, the public cost of one year's class of dropouts is \$8.5 billion, or almost \$3.9 billion in discounted "present value" terms (discounting at 3.5 percent each year).

Table 6

Each Dropout Costs North Carolina an Additional \$4,437 Annually	
Lost State Income Tax Revenue	\$995
Incarceration Costs	\$1,946
Medicaid Costs	\$1,496
Total Public Cost per Dropout	\$4,437

The Public Benefits of School Choice in North Carolina

Advocates of competition in education generally believe not only will children who participate in school choice programs benefit, but that overall productivity of public schools will increase in response to a school choice program. Nevertheless, most research on school choice initiatives focuses on the individual effects on students participating in school choice programs. A more complete characterization of the effects of school choice, however, would include both the general or system-wide impacts as well. As we have highlighted, the public costs associated with high school dropouts in North Carolina are large. If competition from private schools is associated with higher graduation rates in public schools, then increasing competition via school choice programs not only will produce benefits to public and private school children, but it will be an effective way to increase the productivity of public schools and confer large public benefits by reducing the number of high school dropouts.

Private School Competition Improves Public School Graduation Rates

Assessing the impact of competition from private schools on nearby public school graduation rates requires sophisticated statistical methods. Few studies have employed methods rigorous enough to sufficiently control for confounding influences and thus estimate the true relationship. The main difficulty is that private schools do not appear randomly; rather, the demand for private schools typically arises partly in response to public school quality. In mathematical terminology, the number of private school students and public school quality are “simultaneously determined.” Studies that look at the simple relationship between the percentage of private school students in an area and school quality could thus draw the inaccurate conclusion that a high percentage of private school students in a district results in lower public school quality.

Some studies have employed adequate methods, and they provide a growing body of evidence that competition from private schools improves achievement in neighboring public schools. Hoxby provides a review of this evidence.²³ Perhaps the best-designed study was conducted by Dees.²⁴ The Dees study used data from all U.S. counties from the National Center for Education Statistics’ Common Core of Data and found that most studies of the relationship between competition and public school graduation rates “dramatically underestimate the effect of competition from private schools on the rate of high school completion in public schools.” Dees’ results indicate that an increase in the percentage of students enrolled in private schools equal to one standard deviation (or about 3.9 percentage points of total enrollment in North Carolina) is associated with a 1.7-percentage-point decline in the public school dropout rate overall and a 3.4-percentage-point decline in public school districts where at least 20 percent of students are non-white.

Overall, about 7 percent of North Carolina students are in private schools, according to the North Carolina Department of Public Instruction. This is relatively low compared to other states. Using data from the 2000 U.S. Census to calculate the percentage of students in grades 1-12 enrolled in private schools in each community in North Carolina results in a somewhat higher estimate of 8.6 percent (or about 1,500 more private school students than reported by the state). North Carolina’s relatively low private school enrollment is likely a function of the high percentage of its students who are non-white. Minority students traditionally have much lower rates of private school enrollment than white students. However, there are large differences in the percentage of students enrolled in private schools across North Carolina’s communities, with a range from zero to more than 20 percent in some towns.²⁵

Because we know that officially reported graduation rates in North Carolina from previous years are unlikely to be accurate, an analysis of the relationship between competition in education (as measured by the percentage of children enrolled in private schools) and public school graduation rates would be problematic. For our analysis of the public benefits of competition from private schools, we used a range of estimates produced by our research in other states and by research conducted nationally by university economists. We estimate that private school enrollment causes public school graduation rates to increase by 2.4 percentage points to 4.8 percentage points for every one standard deviation increase in private school enrollment. These estimates fall between the national results obtained by Dees and the results of research in specific states, and are moderate compared to our own previous results obtained using data in other states.²⁶

Even a Modest School Choice Program Would Reduce North Carolina Dropouts by up to 5,483 Each Year, Saving up to \$24 Million Annually

In this section we analyze the impact of educational reform that would increase enrollments in private schools by allowing North Carolina children to attend the public or private school of their choice using public funds.

Based on the finding (detailed in the previous section) that an increase in private school enrollments will improve North Carolina public school graduation rates due to improved competitive incentives, we calculate that increasing the percentage of North Carolina children enrolled in private schools by 3.9 points would mean:

- About 53,754 additional students enrolled in private schools.
- Between 2,708 and 5,483 fewer dropouts from North Carolina public schools each year, due to the positive incentives provided by competition from private schools.
- Increased tax revenues and reduced Medicaid and incarceration costs totaling \$12 million to \$24 million as a result of the reduction in public school dropouts. What's more, because dropouts use other social services and incur other costs not included in these three measurements, the total public benefits likely would be 50 percent to 100 percent higher than these figures.
- Total public benefits of between \$601 million and \$1.2 billion over an expected lifetime of 50 years for each class of reduced dropouts, since differentials in earnings, public assistance and incarceration rates between dropouts and graduates are lifelong patterns. The "present value" of these 50 years of benefits, discounted at 3.5 percent each year, is \$282 million to \$571 million. The total value of the lifetime public benefit of each dropout prevented in North Carolina's public schools is about \$221,854, or a present value of \$104,074.

Table 7 presents our calculations of the public benefits that would result from even a modest school choice program in North Carolina. Changing the size of a program to provide school choice to a larger percentage of North Carolina's school-age children and introducing more competition into North Carolina's education system would increase the magnitude of these impacts, but not the basic conclusion that the potential public benefit of reducing the number of dropouts in just three areas of public interest (tax revenue, Medicaid costs and incarceration costs) would be \$4,437 annually and \$221,854 (with a present value of \$104,074) over the working lifetime of each dropout.

Table 7

The Public Benefits of a School Choice Program in North Carolina		
Total Public Enrollment Grades 1-12	1,378,306	
Cohort of Potential Graduates	112,826	
Current Annual Dropouts	38,135	
Increase in % of North Carolina Students in Private Schools	3.9%	
Annual Dropout Reduction	Low Impact Estimate	-2,708
	High Impact Estimate	-5,483
Annual Public Benefits From Increase in School Competition <small>(see Table 6 for Details)</small>	Low Impact Estimate	\$12,013,598
	High Impact Estimate	\$24,328,828
Lifetime Public Benefits of 3.9 Percent Increase in Competition	Low Impact Estimate	\$600,679,907
	High Impact Estimate	\$1,216,441,391
Lifetime Benefits Discounted to Present Value (at 3.5% per Year)	Low Impact Estimate	\$281,786,367
	High Impact Estimate	\$570,647,688
Average Lifetime Public Benefit of Reducing Each Dropout		\$221,854
Average Lifetime Benefit Discounted to Present Value (at 3.5% per Year)		\$104,074

Conclusions

This study highlights the public costs of the failure of individuals to graduate from high school in North Carolina. Our analysis of costs and benefits associated with dropouts included just a few of the largest state programs where the impact of educational attainment on public costs is likely to be most significant. Most importantly, this study used objective empirical methods to document the public cost and benefit implications of education policies that often are debated solely on the basis of their impact on individuals.

Each student who fails to graduate from high school in North Carolina creates large public costs. While this fact has been intuitively understood for some time, this study empirically assessed the cost effectiveness of policies that seek to improve the performance of North Carolina's public schools. We conclude that introducing more competition into K-12 education in North Carolina would significantly improve public high school graduation rates; that the impact of competition provides a cost-effective method for improving the productivity of public schools; and that this would bring about a large reduction in the public costs associated with dropouts.

These results indicate that school choice programs, rather than benefiting individuals at the expense of the public, provide large public benefits that probably exceed even the benefits realized by students participating in the programs.

Endnotes

- ¹ The Education Trust, "Getting Honest About Grad Rates: How States Play the Numbers and Students Lose," June 2005; Education Policy Center of the Urban Institute, "Who Graduates? Who Doesn't?: A Statistical Portrait of Public High School Graduation, Class of 2001," 2003; The Editorial Projects in Education Research Center, "Diplomas Count," 2006.
- ² The effect of school vouchers on the test scores of participants has been extensively researched. Seven studies of voucher participant effects using random assignment, the gold standard of social science research, find that voucher students' test scores were higher than those of students who were denied a voucher due to a random lottery. See Greene, J., Peterson, P. and Du, J., "School Choice in Milwaukee: A Randomized Experiment," in *Learning from School Choice*, eds. Paul Peterson and Bryan Hassel, Brookings Institution, 1998; Rouse, C., "Private School Vouchers and Student Achievement," *Quarterly Journal of Economics*, May 1998; Greene, J., "Vouchers in Charlotte," *Education Next*, Summer 2001; Howell, W. and Peterson, P., *The Education Gap*, Brookings Institution, 2002; and Barnard, J., Frangakis, C., Hill, J. and Rubin, D., "Principal Stratification Approach to Broken Randomized Experiments: A Case Study of School Choice Vouchers in New York City," *Journal of the American Statistical Association*, June 2003.
- ³ U.S. Census Bureau, Current Population Survey, March 2004, 2005 and 2006 Supplement. The CPS is known to understate dropout numbers because it does not sample populations in institutions (such as prisons) and because it does not distinguish between those who obtain a GED and those who graduate from high school with a diploma. Because research suggests that the labor market outcomes of a GED student are more similar to those of a dropout than a high school graduate, the distinction is important. Since the CPS counts GED recipients as high school graduates, its data will cause us to underestimate the public costs of North Carolina's high school dropouts.
- ⁴ Education Policy Center, "Who Graduates? Who Doesn't?"; National Center for Education Statistics of the U.S. Department of Education, "The Averaged Freshman Graduation Rate for Public High Schools from the Common Core of Data, School Years 2001-2002 and 2002-2003," October 2005; the Intercultural Research Association, "North Carolina Public School Attrition Study, 2005-06," 2006.
- ⁵ North Carolina Department of Public Instruction, "North Carolina Public Schools Statistical Profile," various years.
- ⁶ Education Trust, "Getting Honest About Grad Rates."
- ⁷ North Carolina Department of Public Instruction, "North Carolina Public Schools Statistical Profile," 2006.
- ⁸ The EPERC calculates graduation rates using a method known as the "cumulative promotion index." This is a widely accepted method used to estimate the numbers of students who fall off track for earning a diploma at various points between the ninth grade and the expected time of graduation. This study relies on graduation rates calculated with the cumulative promotion index.
- ⁹ North Carolina Department of Public Instruction, "NC Releases First Four-Year Cohort Graduation Rate," February 28, 2007.
- ¹⁰ For the earnings calculations here, we limited the age range to 20-64 because labor-force participation drops significantly after this age, as do wage and salary earnings, while Social Security income increases among all categories of educational attainment.
- ¹¹ Moretti, E., "Does Education Reduce Participation in Criminal Activities?" University of California at Berkeley, working paper, 2005.
- ¹² This estimate is appropriate to illustrate the earnings impact of educational attainment, but it does not consider the "equilibrium effects" that would occur in the North Carolina labor market if all dropouts actually did graduate - that is, the ways in which the larger economy would change as a result of such a dramatic rise in high school graduation rates.
- ¹³ National Association of State Budget Officers, "State Expenditure Report, 2005," November 2006.
- ¹⁴ The Medicaid matching rate for North Carolina was 39.13 percent in 2005, 39.34 percent in 2006 and 39.22 percent in 2007 for most but not all Medicaid services.
- ¹⁵ Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services, MSIS state summary data. Note that some of these beneficiaries are double counted or more.
- ¹⁶ Centers for Disease Control and Prevention, *National Vital Statistics Reports*, Vol. 51, No. 11, June 25, 2003.
- ¹⁷ Callahan, C., et.al. "A Longitudinal Model of Health Insurance, An Update: Employer Sponsored Insurance, Medicaid, and the Uninsured," U.S. Department of Health and Human Services, working paper, 2005.
- ¹⁸ We did not include the average cost of disabled Medicaid recipients in calculating a weighted average cost per Medicaid beneficiary because the need for these services is unrelated to educational attainment. These are among the highest-cost Medicaid beneficiaries and the effect of excluding them is to lower our calculation of the weighted average cost per Medicaid recipient. We treated elderly recipients similarly, and they also are among the highest-cost Medicaid recipients, although the cost of these services is somewhat related to educational attainment. The result is a lower average cost per Medicaid beneficiary than if all beneficiaries were included.
- ¹⁹ National Association of State Budget Officers, "State Expenditure Report 2005," November 2006.
- ²⁰ North Carolina Department of Correction, "Research Bulletin #49," March 2006.
- ²¹ Lochner, L. and Moretti, E., "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self Reports," National Bureau of Economic Research Working Paper #8605, 2001.
- ²² Data on length of sentences and percentage of sentence served were calculated using data in the North Carolina Department of Correction's 2004-05 Statistical Report.
- ²³ Hoxby, C., "School Choice and School Competition: Evidence from the United States," *Swedish Economic Policy Review* 10 (2003).
- ²⁴ Dees, T., "Competition and Quality of Public Schools," *Economics of Education Review* 17:419-427 (1998).
- ²⁵ U.S. Census Bureau 2000 Census, Public Use Microdata files.
- ²⁶ The states are Missouri, Indiana and New Hampshire.

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