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.

The High Cost of Failing to Reform Public Education in Indiana

Prepared By:
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About the Author

Brian J. Gottlob (bgottlob@poleconresearch.com) is the Principal of PolEcon 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 PolEcon, 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

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.

Table of Contents

Executive Summary

This study documents the public costs of high school dropouts in Indiana, and examines how school choice would provide large public benefits by increasing the graduation rate in Indiana public schools. It calculates the annual cost of high school dropouts in Indiana due to lower state income tax payments, increased reliance on Medicaid, and increased incarceration costs. It then examines how competition from higher private school enrollments currently raises public school graduation rates across Indiana's school districts, and calculates the dollar value of the public benefits that would follow from reducing Indiana's public school dropout rate by enacting even a modest school choice program.

Key findings include:

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

- Almost 21,000 Indiana students dropped out of school in 2005. Indiana's overall graduation rate is about 74 percent.
- The annual public costs associated with just one year's class of dropouts is $62.5 million, or about $3,067 per dropout.
- Over an expected lifetime of 50 years, one year's class of dropouts will cost the state of Indiana $3.1 billion.
- The figures above include costs from only three sources: lost income tax revenue ($400 per dropout per year), increased Medicaid costs ($1,362), and increased incarceration costs ($1,305). Since dropouts also incur many other public costs, the true public cost of dropouts is actually larger than $3,067 per dropout per year.
- The state portion of school funding in Indiana (not including local and federal funding sources) is about $3,800. This means the state is spending about the same amount on dropouts each year after they leave school as it spent when they were in school.

School choice improves public school graduation rates, producing millions in public savings

- Indiana school districts with more students in private schools have higher public school graduation rates. All Indiana school children appear to benefit from increased competition from private schools.
- The beneficial effect of private school competition on Indiana public schools is large enough that even a modest school choice program, one that increased private school enrollment by about 5 percentage points, would reduce the number of public school dropouts by 1,900 to 3,900 students and save Indiana between $5.8 million and $11.8 million every year.
- The total savings from preventing these students from dropping out, over an expected lifetime of 50 years, would be between almost $300 million and almost $600 million.

Introduction

Across the nation, attention increasingly is being focused on high dropout rates in public high schools. In Indiana, the recent release of a report by the Annie E. Casey Foundation has brought additional media and public attention to the issue. The report indicates that, among young people ages 16-19, Indiana has the highest rate of high school dropouts in the nation.[1]

The individual consequences of not graduating from high school are large and well documented, but there are also substantial public or societal costs when individuals do not graduate from high school. Public costs result when individuals who do not graduate from high school contribute less to society and consume more public services. 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, 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 make reforms to public education that address the problem.

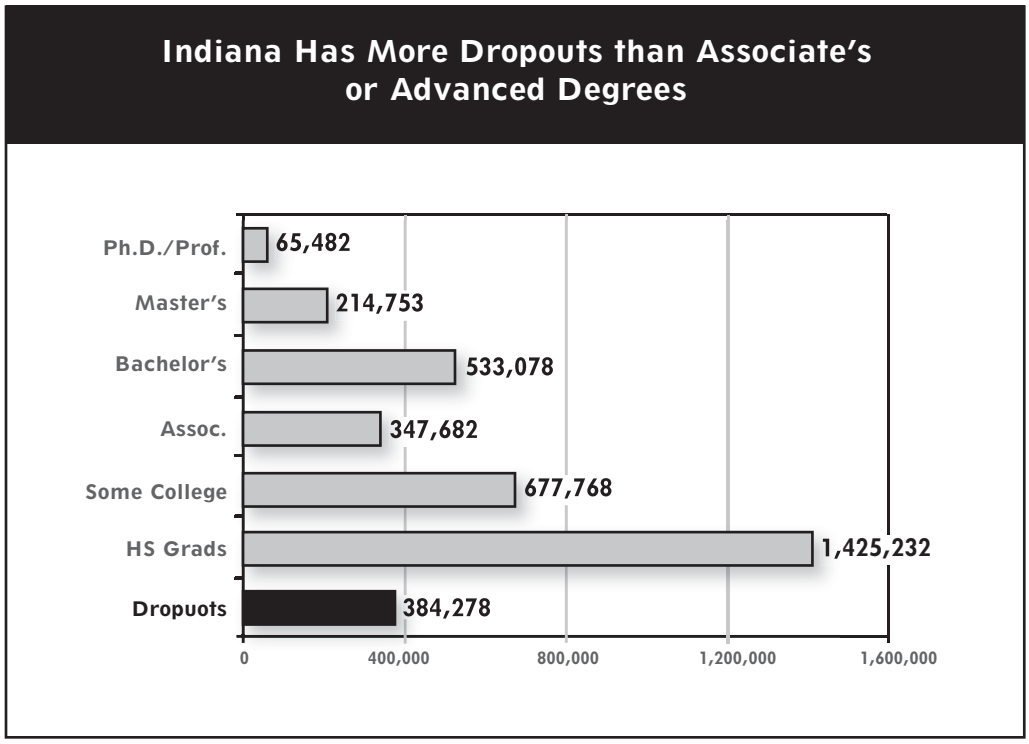
An understanding of public costs and benefits is fundamental to debates about education reform, but they are rarely documented. Expectations of large private and public gains from improved educational outcomes help explain the willingness of citizens to support additional spending on public schools as well as the myriad of reform initiatives that have swept through public education over the past two decades.

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 Indiana 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 have increasingly argued that the benefits to those students are outweighed by the public costs of choice. In response to this, 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 the 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 Indiana, not just those with children in schools.

The Size of the Dropout Problem in Indiana

High school graduation is an important predictor of an individual's future economic success. It also represents a key indicator of the performance of school districts and educational systems that sends a clear signal about the need for or results of education reform. Figure 1 shows the number of Indiana residents aged 20-64 by educational attainment.[2] The figure indicates that 384,278 adults between the ages of 20 and 64 do not have a high school diploma. Fifty-eight percent of dropouts in Indiana are male.

Figure 1



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey March 2005 data for Indiana

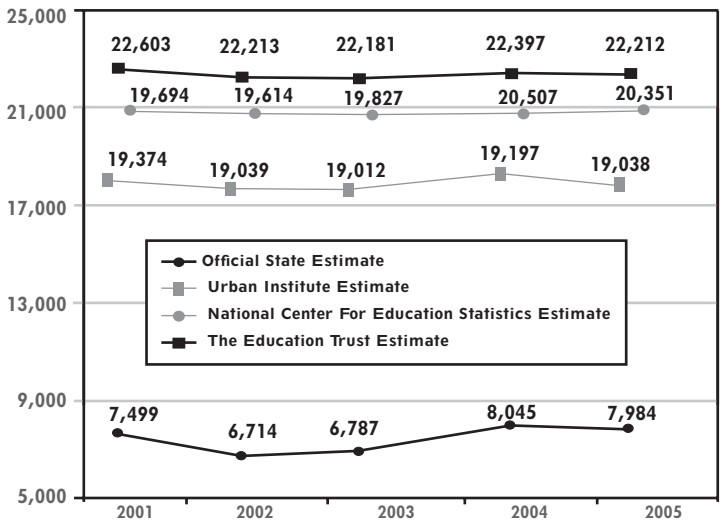
Indiana Underreports Its Dropout Rate

Most states and school districts significantly understate the problem of students failing to graduate from high school. Independent estimates by the Urban Institute[3], the National Center for Education Statistics of the U.S. Department of Education[4] and the Education Trust[5], as well as our own review of annual enrollment and graduation data, indicate that the number of dropouts is much higher in Indiana than reported. These independent estimates of high school dropouts in Indiana place the state's overall graduation rate at 72 percent to 76 percent, rather than the 89.8 percent reported by the Indiana Department of Education for 2004-05.[6] This means that 11,000 to 13,000 more students drop out each year than are reported in official state estimates. Using the most detailed and thorough alternative estimates, those produced by the Urban Institute, we estimate that about 20,351 students in Indiana left high school before obtaining a high school diploma, rather than the 8,000 reported by the state.

The problem of understating dropouts is especially apparent among African-American students, for whom the state-reported graduation rate is 86 percent. This rate is more than dubious. The reported rate is much higher than the actual graduation rate for all students throughout the country, and nearly 34 percentage points higher than rate for African-American students in Indiana as calculated by the Urban Institute. The Urban Institute places the African-American graduation rate for all of Indiana at about 74 percent and the graduation rate in the city of Indianapolis at 31 percent.

Figure 2

Indiana's Annual Dropouts Are Much Higher than Reported



Indiana has recently begun to implement reforms in the way it reports its dropout rate. The stated purpose of these reforms is to make its officially reported dropout rates more realistic. However, implementation of these reforms is still underway. While we await Indiana's new system, we must rely on independent estimates of the dropout rate if we wish to have a realistic picture of the extent of the dropout problem.

Dropouts Increase State Government Costs and Lower Economic Growth and Revenues

For the 384,278 Indiana residents between the ages of 20 and 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 20,000 young people who drop out of Indiana schools annually provides an indication of the public cost and benefits at stake for each year Indiana 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 or social costs.

Table 1

Indiana 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	63.8%	77.8%	80.4%	88.6%	86.5%	85.8%	92.3%
Unemployment Rate	12.7%	4.4%	5.5%	2.9%	1.8%	1.8%	0.0%
Annual Earnings—Wages & Other Income	$13,147	$23,461	$25,301	$30,923	$47,017	$49,912	$115,886
% on Medicaid or with Child on Medicaid	33.8%	14.4%	10.7%	10.9%	4.6%	4.2%	1.2%
Incarceration Rates (Males Only)				ALL COLLEGE DEGREES REPORTED TOGETHER			
White	0.93%	0.39%	0.27%		0.08%		
African-Americans	4.11%	2.35%	2.15%		0.75%		

Source: U.S. Census Bureau, Current Population Survey, March Supplement 2003-2005 and PolEcon calculations. Incarceration rates from U.S. Census as reported in E. Moretti (2005).[8]

Table 1 shows how a few measures of social costs are affected by educational attainment in Indiana. The table shows that Indiana residents without a high school diploma are less likely to be in the labor force and have a much higher probability of being unemployed than do high school graduates. Dropouts are much more likely to be receiving or to have a child who is receiving Medicaid benefits. Finally, dropouts are more likely to be incarcerated than are those with higher levels of educational attainment.

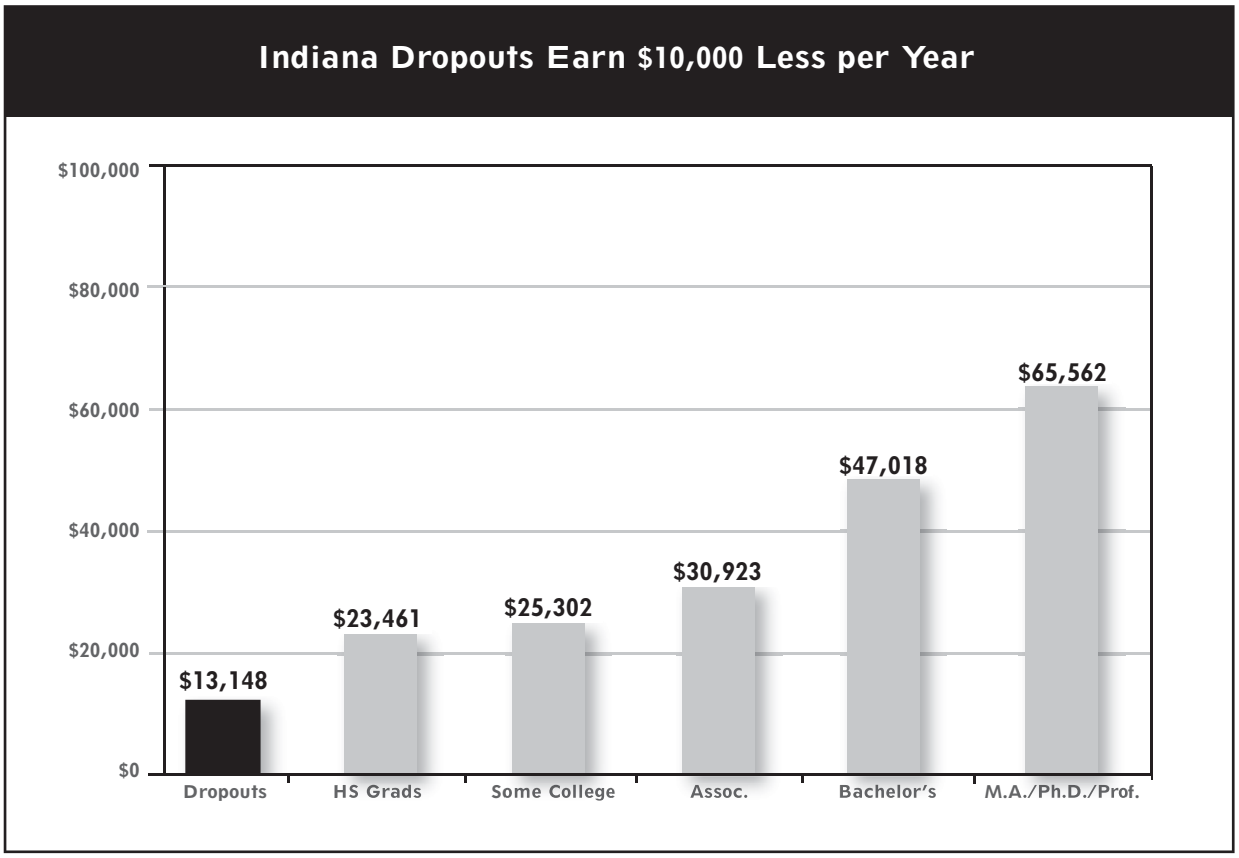
The Impact of Educational Attainment on Earnings

The average annual earnings of dropouts are far lower than those of people who have received a high school diploma. Figure 3 shows the labor-market consequences of dropping out in terms of annual earnings in 2004. The chart shows that dropouts earn, on average, about $10,314 less than high school graduates.

The wage and salary differential presented in Figure 3 is a result of lower-paying jobs, lower labor-force participation and lower employment rates of dropouts compared to graduates. As Figure 4 shows, dropouts have much higher unemployment rates than do individuals with at least a high school diploma. The unemployment rate for high school dropouts is 12.7 percent in Indiana.

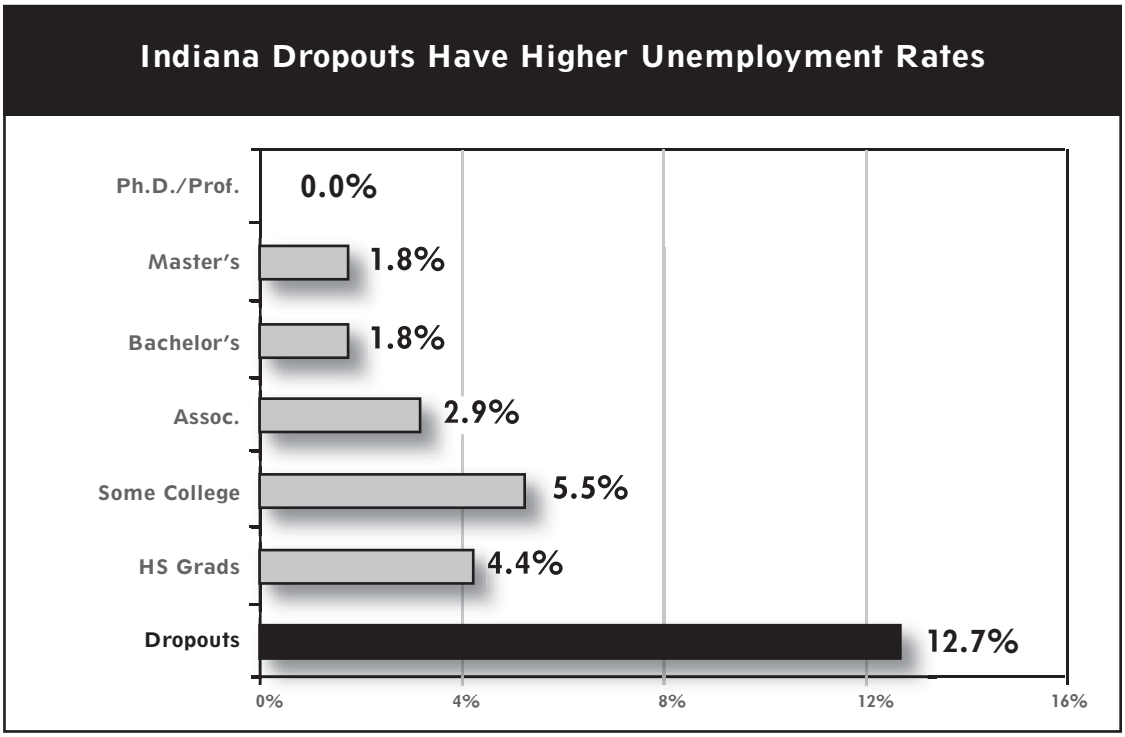
Table 2 depicts the simple relationship between education and earnings. However, because earnings also are a function of other factors, including age, experience and sex, we used regression analysis to more accurately estimate the relationship between education and earnings independent of the influences of those factors. We used a subset of Indiana respondents to the March 2005 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 impact of age and sex were removed each additional year of high school attended added about $2,288 to the subsequent annual earnings of dropouts in Indiana. This implies that there are significant private and public benefits to having students continue for as many years of high school as possible.

Figure 3



Source:PolEcon analysis of U.S. Census Bureau's Current Population Survey data for Indiana

Figure 4



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey March 2005 data for Indiana

The higher earnings of high school graduates relative to dropouts is a substantial individual or private benefit to graduating from high school, but it also produces public benefits. Better educated individuals increase the productivity of the economy, their higher earnings produce higher revenues for the state of Indiana and, as we highlight below, higher educational attainment results in lower use of many public-assistance programs.

Dropouts Cost Indiana $4.4 Billion in Lost Earnings Each Year

The difference we found in annual earnings between dropouts and high school graduates implies that, if all of Indiana's residents of working age had obtained at least a high school diploma, total earnings in Indiana in 2005 would have been $4.4 billion higher.[9]

If even a small fraction of Indiana's 384,278 working-age dropouts went beyond high school to attend postsecondary schools, the increase in earnings would be substantial.

Table 2

Indiana Dropouts Earn a Total of $4.4 Billion Less per Year

Education Level	Population	Average Earnings	Total Earnings	No Dropouts (All Become HS Grads)
Dropouts	384,278	$13,147	$5,052,102,866	$0
HS Grads	1,425,232	$23,461	$33,437,367,952	$42,452,914,110
Some College	677,768	$25,301	$17,148,208,168	$17,148,208,168
Associate's Degree	347,682	$30,923	$10,751,370,486	$10,751,370,486
Bachelor's Degree	533,078	$47,017	$25,063,728,326	$25,063,728,326
M.A./Ph.D./Prof.	280,235	$65,562	$18,372,767,070	$18,372,767,070
Total	**3,648,273**	**$29,986**	**$109,397,114,178**	**$113,788,988,160**
			Difference	**$4,391,873,982**

The earnings impact from a more productive workforce would result in increased spending on goods and services that would produce large indirect and induced "multiplier" effects that are not estimated here but that will equal or exceed the direct benefits of increased earnings.

Dropouts Decrease State Income Tax Revenues $150 Million Each Year

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

We used data on the average earnings of Indiana dropouts and high school graduates (ages 20-64) from the March Supplement of the CPS for 2003, 2004 and 2005 to calculate hypothetical tax liabilities using the "TAXISM" models developed by the National Bureau of Economic Research. These models contain 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, we treated all taxpayers as if they were filing as single taxpayers, because we had no data on spousal income (or whether there was a spouse) for the population of high school dropout taxpayers. We calculated state tax liabilities for taxpayers with zero to two dependent child exemptions and weighted the number of returns according to the percentage of dropouts with and without dependent children, as gleaned from the CPS. 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 384,000 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 graduates and dropouts.

The estimated Indiana state income-tax liability for the six combinations of taxpayers is presented in Table 3. The table shows that the lower earnings of Indiana's working-age dropouts result in state income-tax revenues that are $150 million lower 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 $4.4 billion in earnings would generate would also produce more than $120 million in sales-tax revenue as well as additional state and local revenues.

Table 3

Dropouts Cost Indiana $150 Million in Lost Tax Revenue per Year

		2005 State Income Tax Liability		
	Income	No Children	1 Child	2 or More Children
HS Grads	$23,461	$764	$606	$444
Dropouts	$13,147	$413	$168	-$21
	Difference	$351.0	$438.0	$465.0
	Times Number of Dropouts	239,021	57,257	88,000
		$83,896,342	**$25,078,751**	**$40,919,843**
			Grand Total:	**$149,894,935**

Dropouts Are Much More Likely to Rely on Safety Net Programs

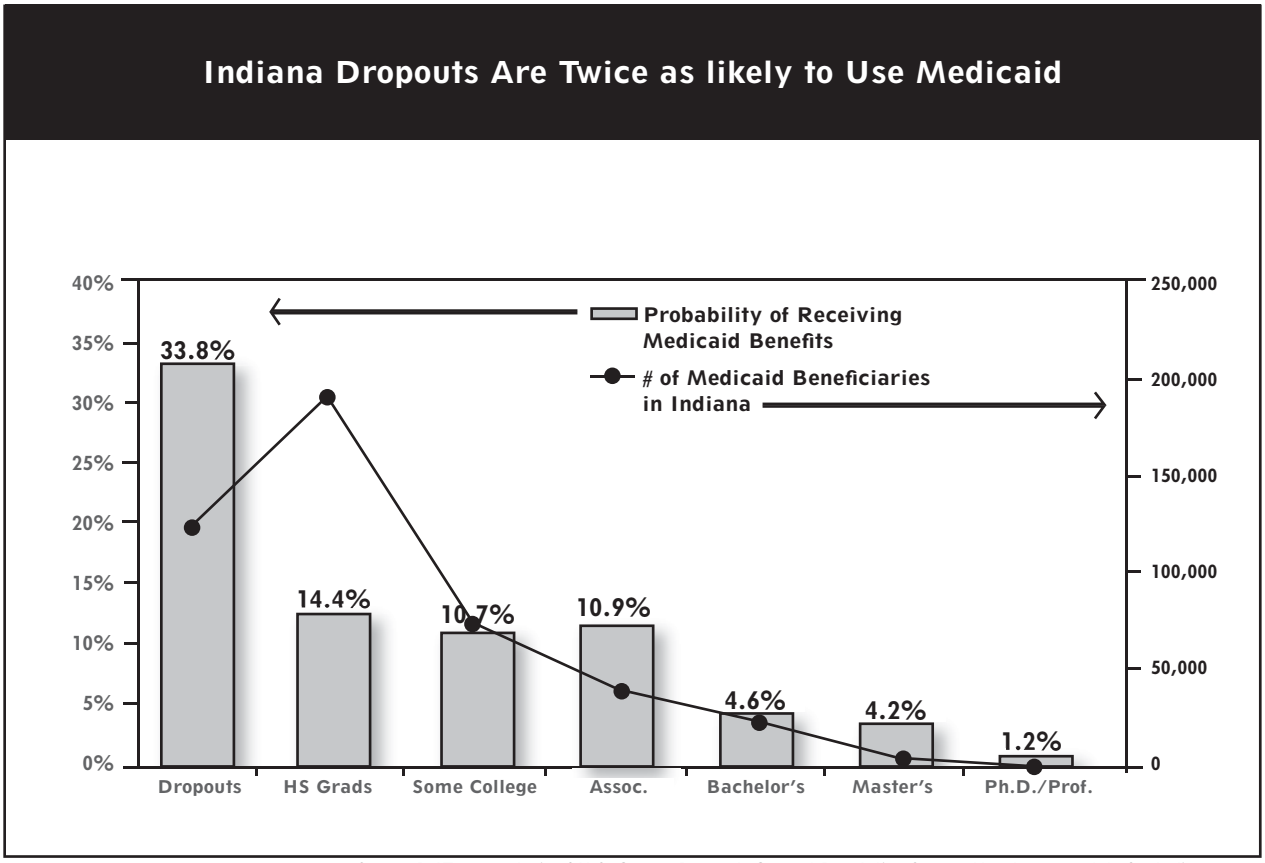
Individuals who fail to obtain at least a high school diploma are at a much greater risk of reliance on safety-net programs such as Medicaid, Temporary Assistance to Needy Families, housing assistance and food stamps. The probability of being a beneficiary of one or more public-assistance programs increases 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 Indiana. Medicaid is the largest and most costly safety net program in Indiana and across the country. Combined

state and federal funds for Medicaid account for 21.5 percent of the total budget of the state of Indiana, a slightly lower percentage than the 22.5 percent national average.[10]

The cost of Medicaid, which provides health care for lower-income individuals, is shared by the state and federal governments. In Indiana, there were 1,157,231 individuals eligible for Medicaid and 1,018,496 Medicaid beneficiaries in 2003.[11] The cost of services (excluding administrative and other program costs) exceeded $4.3 billion in 2004, of which the state of Indiana was responsible for about 37 percent.[12] Indiana spent about $1.5 billion of its general fund

Figure 5



Source: PolEcon analysis of U.S. Census Bureau's Current Population Survey March 2003-05 data for Indiana

budget on Medicaid in 2004.[13] Overall, about 15 percent of Indiana residents receive Medicaid benefits – lower than the average for all states, which is 19 percent. But 51 percent of all births in Indiana were to mothers receiving Medicaid benefits, significantly higher than the 41 percent average for all states, according to the most recent available data from the Vital Statistics Reports of the National Centers for Disease Control.

The probability that an individual in Indiana will be a Medicaid beneficiary is strongly related to his or her educational attainment. As Figure 5 shows, individuals in Indiana who have at least a high school diploma (40 percent of the working-age population) represent the largest category of Medicaid beneficiaries, but high school dropouts (11 percent of the working-age population and 6 percent of the total population) are much more likely to receive Medicaid benefits. Figure 5 shows that, based on the CPS for March 2003-2005, the probability that a high school dropout or a dependent child in Indiana receives Medicaid benefits is about 34 percent. The probability drops sharply to 14 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.[14] Nevertheless, it does highlight the relationship between educational attainment and public-assistance costs. It will, however, produce a low estimate of the cost of dropouts and the impacts of educational reform on public costs and benefits.

The Additional Medicaid Costs of Dropouts Total at Least $510 Million Each Year and $190 Million of State Funds

To estimate the Medicaid cost of dropouts, we compared the probability that an Indiana high school dropout, or the dependent child of a dropout, would be on Medicaid to the probability for high school graduates (about 34 percent compared to 14 percent), and multiplied the change in the number of expected Medicaid recipients by the average cost per Medicaid recipient (not including disabled recipients).[15] We first multiplied the estimated number of dropouts on Medicaid (from the CPS) by the average cost per Medicaid recipient. We then estimated the number of dropouts that would be on Medicaid if, instead of leaving school, they had all obtained high school diplomas. Table 4 presents

Table 4

Dropouts Cost Indiana $190 Million in Medicaid Costs per 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 Mediciad if All Graduated	Total Cost = Recipients x Average Cost	State Share of Mediciad Costs
Dropouts	384,278	33.8%	129,965	$888,795,146	$332,320,505	$0	$0	$0
HS Grads	1,425,232	14.4%	205,556	$1,405,741,353	$525,606,692	260,979	$1,784,764,190	$667,323,331
Some College	677,768	10.7%	72,701	$497,182,287	$185,896,457	72,701	$497,182,287	$185,896,457
Associate's Degree	347,682	10.9%	38,015	$259,974,204	$97,204,355	38,015	$259,974,204	$97,204,355
Bachelor's Degree	533,078	4.6%	24,599	$168,225,844	$62,899,643	24,599	$168,225,844	$62,899,643
Master's	214,753	4.2%	9,063	$61,979,382	$23,174,091	9,063	$61,979,382	$23,174,091
Ph.D./Prof.	65,482	1.2%	776	$5,306,852	$1,984,232	776	$5,306,852	$1,984,232
Total	**3,648,273**	**19.4%**	**480,675**	**$3,287,205,068**	**$1,229,085,975**	**406,133**	**$2,777,432,759**	**$1,038,482,109**
	Annual Mediciad Cost of Dropouts					**74,542**	**$509,772,309**	**$190,603,866**

estimated dropout-related Medicaid costs. We estimated that, if all Indiana dropouts had received a high school diploma, there would be 74,542 fewer Medicaid recipients, saving the Medicaid program about $510 million annually and the state of Indiana about $190 million in its share of those Medicaid costs. As noted above, because the CPS is known to underestimate the number of Medicaid recipients in the population, these figure likely underestimate the actual cost of Medicaid related to dropouts in Indiana.

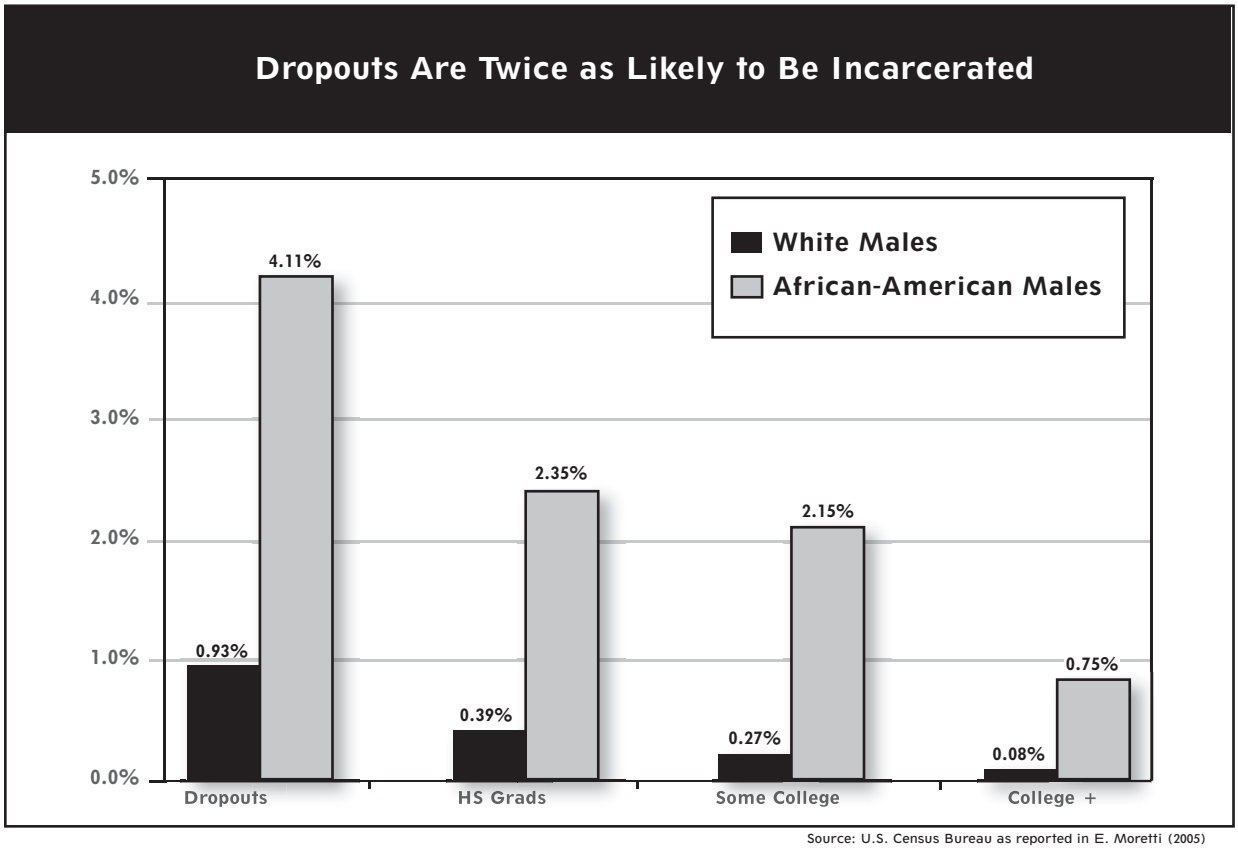
Incarceration Costs

Indiana spent $743 million for its prison system in 2004, of which $673 million was general funds.[16] The cost to house each prisoner (not including administrative cost of the prison system) averages about $59 a day or about $21,531 a year.[17]

Although the chances that any one individual will be incarcerated in Indiana are small, the probability is more than twice as high for a high school dropout as it is for a 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 sometime during their lifetimes. 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 Indiana. Figure 6 shows the probability of both white and African-American male dropouts of being incarcerated at some point during their lifetimes.

In calculating the impact on earnings and Medicaid, we relied on individual responses by Indiana residents to monthly CPS surveys. For incarceration costs we had no direct individual measures of educational attainment, criminal activity and incarceration in Indiana. Instead, we relied on the research of others for our estimates of the impact of dropouts on incarceration rates. We used those estimates to determine the likely number of Indiana dropouts each year that can be expected to be incarcerated during the course of their lifetimes. After we determined the number of each year's dropouts who are likely to be incarcerated, we used data on the type of crimes and the average length of sentences from the Indiana Department of Correction to calculate a "weighted average sentence," which is applied to each projected incarceration.[18] The weighted average sentence was then adjusted based on a weighted "percentage of sentence served," using statistics for each class of crime and sentence. 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 that year's dropouts.

Figure 6



Source: U.S. Census Bureau as reported in E. Moretti (2005)

In addition, we multiplied the costs by 0.5 to account for recidivism or the tendency of prisoners to be multiple offenders and to be imprisoned more than one time during their lives. To keep our estimate of the cost of recidivism conservative, we assumed two incarcerations for the calculated number of prisoners, a recidivism rate that is lower than most studies suggest. 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.

Although we allocated those costs to one year's worth of dropouts, the actual costs are incurred over a number of years or the length of sentences. Also, it is possible that incarceration costs could occur in county or other jails, and possibly other states, but those factors do not alter the basic conclusions about the incarceration costs associated with dropouts.

Table 5 presents our estimates of the impact that dropouts have on annual incarceration costs. The table first calculates the expected number of incarcerations based on the annual number of dropouts in the state of Indiana. We then calculated the expected number of incarcerations that would occur if all high school students graduated each year. The incarceration cost of dropouts is the difference between the number of incarcerations and associated costs

Table 5

Dropouts Cost Indiana over $27 Million in Incarceration Costs per Year

	2001	2002	2003	2004	2005
Total Graduates	59,737	58,705	58,620	59,191	58,702
Dropouts	21,098	20,733	20,703	20,905	20,732
Graduation Rate	73.9%	73.9%	73.9%	73.9%	73.9%
Cohort African-American Dropouts	4,479	4,402	4,395	4,438	4,401
African American Male Dropouts	2,553	2,509	2,505	2,530	2,509
Cohort White Dropouts	15,591	15,322	15,300	15,449	16,331
White Male Dropouts	9,199	9,040	9,027	9,115	9,635
Probable Incarcerations					
African-American	105	103	103	104	103
White	88	87	87	88	92
Probable Incarcerations w/out Dropouts					
African-American	45	44	44	45	44
White	16	15	15	15	16
Reduction in Incarcerations					
African-American	60	59	59	59	59
White	73	71	71	72	76
Total Incarceration Reduction	**133**	**130**	**130**	**131**	**135**
One Year Incarceration Costs ($millions)	$2.50	$2.52	$2.61	$2.73	$2.91
Total Costs For Intital Incarcerations ($millions)	$15.53	$15.65	$16.19	$16.95	$18.03
Recidivism Cost ($millions)	$7.76	$7.83	$8.10	$8.48	$9.02
Total Cost of Dropouts ($millions)	$23.29	$23.29	$24.29	$25.43	$27.05
Cumulative Incarceration Costs Attributable to Dropouts	$23.29	$46.77	$71.06	$96.49	$123.54
Public Cost per Dropout	**$1,104**	**$1,132**	**$1,173**	**$1,217**	**$1,305**

if there were no dropouts in a year in Indiana, compared to the expected number of incarcerations associated with the actual number of dropouts. The table shows that the cost of one year of dropouts (over the lifetime of the dropouts) is estimated at $27 million in Indiana. Over the five-year period examined, the cumulative cost is estimated to be about $123.5 million. The table also divides the cost of one year of dropouts by the total number of dropouts to arrive at an average incarceration cost per dropout. Our cost calculations did not include any costs for policing or prosecuting those who are incarcerated or any administrative or capital costs of the prison system.

Indiana 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 results in 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 of dropouts across the entire population of new dropouts in that year to arrive at an average cost per dropout.

The total cost of additional dropouts each year, averaged over the annual population of new dropouts, suggests that, on average, the state of Indiana will continue to pay nearly as much for each dropout after he leaves school as it does in state education aid while he attended school. The annual costs in Medicaid, incarcerations and lost tax revenue associated with just one year's class of dropouts (an estimated 20,732 in 2005) is at least $62.5 million. These annual costs average about $3,067 per dropout. Average state tuition aid (excluding local and federal funding sources) is about $3,800 per pupil. Because there are many other costs associated with dropouts that are not documented here, and because reduced earnings patterns follow graduates their entire lives and incarceration costs and Medicaid usage are all multi-year costs, it is reasonable to conclude that the state of Indiana continues to spend at least as much on dropouts after they have left school as it did in state aid and other expenditures when they were in school.

Table 6

Each Dropout Costs Indiana Over $3,000 per Year

Lost State Income Tax Revenue	$400
Incarceration Costs	$1,305
Medicaid Costs	$1,362
Total Public Cost per Dropout	**$3,067**

More important, the state will continue to incur the cost of each dropout for decades. Citizens of the state of Indiana continue to pay for the state educational system's failures well into the future. Over their lifetimes of an additional 50 years, the public cost of one year's dropout class is $3.1 billion, or almost $1.47 billion in discounted "present value" terms (discounting at 3.5 percent each year).

The Impact of Competition on Public School Graduation Rates

Advocates of competition in education generally believe that not only will children who participate in school

choice programs benefit, but that overall productivity of public schools would increase as well. 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 systemwide impacts as well as the individual effects of competition. As we have highlighted, the public or social costs associated with high school dropouts in Indiana are large. If competition from private schools is associated with higher graduation rates in public schools, then increasing competition via school choice programs will not only produce benefits to public and private school children, it will be an effective way to increase the productivity of public schools and confer large social benefits by reducing the number of high school dropouts.

Sophisticated Methods Are Required to Determine the Impacts of Competition

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 estimate the true relationship. The main difficulty is that private schools typically do not appear randomly, but rather, the demand for private schools arises in response to public school conduct and 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 productivity.

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.[19] Perhaps the best-designed study was conducted by Dees.[20] 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 (about 5.4 percentage points in Indiana) is associated with a 1.7 percentage point decline in the public school dropout rate overall, but a 3.4 percentage point decline in public school districts where at least 20 percent of students are non-white.

Overall, the percentage of Indiana students who are in private schools is about 11 percent.[21] However, there are large differences in the percentage of students enrolled in private schools across Indiana's nearly 300 school districts, with a range of zero to more than 40 percent.[22] This variation gives us an opportunity to examine whether higher private-school enrollments lead to higher graduation rates in Indiana public schools. We used a regression analysis similar to Dees' to estimate the relationship between the percentage of private-school students in a district and high school graduation rates in public schools, controlling for income, race, family variables, school spending per pupil and school quality as measured by achievement test scores.[23] We found that the relationship between private-school enrollments and public school graduation rates is nearly twice as large overall in Indiana as in Dees' national study, and for larger school districts in communities with at least 15,000 residents, the relationship between private-school enrollment and graduation rates is between twice and two-and-a-half times as large.

For the analysis of public benefits of competition from private schools, we used a range of estimates of the effect of private-school enrollment on public school graduation rates, ranging from 2.4 percentage points to 4.8 percentage points per one standard deviation increase in private-school enrollments. These estimates are in between the national results obtained by Dees and the results of our analysis of Indiana data; they are also moderate in comparison to results obtained using data in other states.[24] Although an increase in graduation rates of between 2.4 percentage points and 4.8 percentage points may not seem large, the costs of dropouts are so great that the social benefits of even a modest increase in competition will be large.

The Public Benefits of Increasing Competition in Education

In this section we analyze the impact of an educational reform that would increase enrollments in private schools through a school choice program that allows Indiana 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 Indiana public-school graduation rates due to improved competitive incentives, we calculated that increasing the percentage of Indiana children enrolled in private schools by 5.4 points would mean:

- About 56,000 additional students enrolled in private schools.
- Between 1,900 and 3,900 fewer dropouts from public schools in Indiana as a result of strengthened incentives for improvement from private-school competition.
- Annual public benefits from increased tax revenues and reduced Medicaid and incarceration costs of $5.8 million to $11.8 million. And because dropouts use other social services and incur other costs not included in these three measurements, the total public benefits are likely to be 50 percent to 100 percent higher than these figures.
- Total public benefits of between almost $300 million and almost $600 million over the next 50 years for each class of dropouts reduced, since differentials in earnings, public assistance and incarceration between dropouts and graduates are lifelong patterns. The "present value" of these 50 years of benefits, discounted at 3.5 percent each year, is $137 million to $278 million. The total value of the lifetime public benefit of each dropout prevented in Indiana's public schools is about $153,350, or a present value of $71,938.
- At an average cost of $3,800 per student enrolled in a school choice program, a program in Indiana that increases competition from private schools by 5.4 percentage points would cost about $212 million but would reduce state education tuition-aid payments by about $214 million dollars, because the state spends more on students in public schools than it would on students using school choice. Moreover, if the annual public benefits from reduced dropouts in just three areas are subtracted, an additional $2 million in savings would be realized and Indiana could increase high school graduation rates by 5 percentage points.

Table 7 presents our calculations of the public benefits that would result from even a modest school choice program in Indiana. Changing the size of a program to provide school choice to a larger percentage of Indiana's school-age children and introducing more competition into Indiana's education system would change 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 (Medicaid, incarceration costs and state tax revenue), would be $3,067 annually and $153,350 (with a present value of $71,988) over the working lifetime of each dropout.

Combined, the savings in state and local educational expenditures that would result from educating each school choice student at the lower cost of private schools, along with the public benefits that will accrue as a result of competition's impact on public-school graduation rates, are a powerful and financially compelling rationale for introducing school choice reforms in Indiana.

Table 7

The Public Benefits of a School Choice Program in Indiana		
Total Public Enrollment Grades 1-12	1,033,250	
Cohort of Potential Graduates	79,434	
Current Annual Dropouts	20,732	
Size of Choice Program (5.4% of Enrollment)	55,795	
Cost ($3,800 per Student)	$212,021,000	
State Savings ($3,837 per Student)	$214,085,415	
Local Savings ($4,460 per Student)	$262,236,500	
Total Savings	$476,321,915	
Net Savings from School Choice	**$264,300,915**	
Reduction in Dropouts: Low Impact Estimate	-1,930	
High Impact Estimate	-3,861	
Annual Public Benefits From Dropout Reduction (see Table 6 for details)	**Low**	**$5,854,287**
	High	**$11,840,130**
Lifetime Public Benefit of Dropout Reduction (for One Year of Reduced Dropouts)	Low	$292,714,330
	High	$592,006,510
Lifetime Public Benefit Discounted at 3.5% for 50 Years	Low	$137,315,909
	High	$277,717,569

Conclusions

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

Each student who fails to graduate from high school in Indiana creates large public costs. While this fact has been intuitively understood for some time, this study empirically assesses the cost effectiveness of policies that look to improve the performance of Indiana's public schools. We conclude that introducing more competition into K-12 education in Indiana would significantly improve public high school graduation rates, that the impact of competition provides a compelling and 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 the benefits realized by students participating in the program.

Endnotes

[1] Annie E. Casey Foundation, "Kids Count Data Book 2006," available at: http://www.aecf.org/kidscount/sld/databook.jsp.

[2] U.S. Census Bureau, Current Population Survey, March 2005 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 complete 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 Indiana's high school dropouts.

[3] Education Policy Center of The Urban Institute, "Who Graduates? Who Doesn't?: A Statistical Portrait of Public High School Graduation, Class of 2001," 2003.

[4] U.S. Department of Education, National Center for Education Statistics, "The Averaged Freshman Graduation Rate for Public High Schools From the Common Core of Data, School Years 2001-2002 and 2002-2003," October 2005.

[5] The Education Trust, "Getting Honest About Grad Rates: How States Play the Numbers and Students Lose," June 2005.

[6] Indiana Department of Education, available at: http://mustang.doe.state.in.us/TRENDS/grad_sub.cfm?year=2004&pub=1.

[7] 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.

[8] Moretti, E., "Does Education Reduce Participation in Criminal Activities?" University of California at Berkeley, working paper, 2005.

[9] This estimate is appropriate to illustrate the earnings impact of educational attainment, but it does not consider the "equilibrium effects" that would occur in Indiana's 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.

[10] National Association of State Budget Officers, "State Budgets, 2004," Kaiser Family Foundation "State Health Facts On-Line."

[11] 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. Other estimates place the number of beneficiaries at under 900,000.

[12] Medicaid is a matching rate program. In 2003 Indiana's match rate was 38.5 percent for most but not all Medicaid services.

[13] National Association of State Budget Officers, "State Budgets, 2004." Medicaid expenditures do not strictly follow general fund and other fund distinctions in Indiana; these figures represent NASBO estimates.

[14] 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.

[15] We do 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.

[16] National Association of State Budget Officers, "State Spending 2004."

[17] Indiana Department of Correction, "Fact Card," July 2005.

[18] Data on length of sentences and percentage of sentence served were calculated using data in the "Final Report of the Sentencing Policy Committee" of the Indiana General Assembly, November 2004.

[19] Hoxby, C., "School Choice and School Competition: Evidence from the United States," *Swedish Economic Policy Review* 10 (2003).

[20] Dees, T., "Competition and Quality of Public Schools," *Economics of Education Review* 17:419-427 (1998).

[21] The exact percentage depends on whose measurement of private school enrollment one uses. The Indiana Department of Education reports that 108,160 students were enrolled in grades 1-12 in private schools in Indiana in 2005. Estimates from the National Center for Education Statistics and the U.S. Census Bureau (CPS and 2000 Census Data) suggest the number is higher, about 127,000.

[22] U.S. Census Bureau 2000 Census, Public Use Microdata files.

[23] Dees employed ordinary least squares (OLS) models for comparison purposes, but used two-stage least squares (2SLS) models to control for the simultaneous determination between private-school enrollments and public high school graduation rates. Data limitations do not allow us to use 2SLS models in this study, but our OLS estimates (which, as Dees notes, dramatically underestimate the relationship between private-school enrollments and public school graduation rates) do suggest a stronger relationship between competition and public school graduation rates. We used official graduation rates published by the Indiana Department of Education, even though they understate the dropout rate. To the extent that state data understate the number of dropouts across all school districts similarly, the statistical relationship between private-school enrollments and graduation rates will not be affected.

[24] The states include Missouri (Brian Gottlob, "The High Cost of Failing to Reform Public Education in Missouri," Milton and Rose D. Friedman Foundation, 2006), and an unpublished PolEcon analysis in New Hampshire.

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School Choice for Indiana: 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 Indiana 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 Indiana's children.

The High Cost of Failing to Reform Public Education in Indiana

Prepared By:

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Milton and Rose D. Friedman Foundation

October 2006

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