

SCHOOL CHOICE

ISSUES

IN THE STATE

The High Cost of Maryland's Dropout Rate



School Choice for Maryland:

Many agree with the concept. Some disagree. And some simply want more information. As the public debate continues to grow about how best to provide a quality education to all Maryland children, it is important to know the facts about parent choice, and how parent 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 Maryland's children.

Prepared By:
Justin P. Hauke
Fellow

Friedman Foundation for Educational Choice

October 2008

**Study released jointly by the Friedman Foundation for Educational
Choice and the Maryland Public Policy Institute**

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.

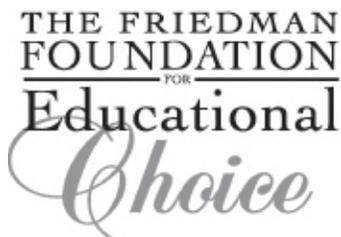
So if you're skeptical about our research on school choice, this is our challenge to you: prove us wrong. Judge our work by scientific standards and see how it measures up. If you can find anything in our work that doesn't follow sound empirical methods, by all means say so. We welcome any and all scientific 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.

The High Cost of Maryland's Dropout Rate

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THE FRIEDMAN FOUNDATION

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Executive Summary

There is a divide in Maryland's schools. Although the state's high school graduation rate is above the national average, its urban school districts have suffered from years of decline. In 2007, the Baltimore city school district's graduation rate was only 35 percent, compared to 81.5 percent in Baltimore's suburbs and 76 percent statewide. The divide between urban and suburban graduation rates in Maryland is the highest in the nation. Among the nation's 100 largest school districts, Baltimore has the 98th-lowest graduation rate.

This study documents the public costs of high school dropouts in Maryland. We examine how Maryland's decreasing graduation rates are materially affecting the state's finances through reduced tax revenues, increased Medicaid costs and higher incarceration rates. This study examines how increased competition from private schools could raise public school graduation rates and save Maryland taxpayers millions of dollars each year.

Key findings of this study include:

- Each year's class of dropouts will cost Maryland taxpayers \$42 million every year.
- About 27,000 Maryland students in the class of 2007 failed to graduate from high school. Independent estimates suggest that the state's overall graduation rate is about 76 percent but urban graduation rates are well below 50 percent.
- On average, Maryland's 393,200 working-age dropouts earn nearly \$10,000 less a year than the state's high school graduates, reducing overall state income by nearly \$4 billion a year. Maryland dropouts can expect to earn \$150,000 less in their lifetimes than high school graduates.
- Every additional Maryland high school dropout costs the state approximately \$1,555 a year in lost revenue, with total lifetime costs (in present value) of \$35,180.
- These cost estimates include only lost revenue from state taxes, increased Medicaid costs and increased incarceration costs. Because high school dropouts incur many other public costs, the true costs of Maryland's high school dropouts are much higher.
- Maryland's high school graduation rates are declining, even as the national graduation rate has been rising, indicating that dropout-related costs to Maryland taxpayers will increase each year.

Expanded school choice programs improve public schools and produce millions of dollars in taxpayer savings every year.

- School districts with greater numbers of students in private schools have higher public school graduation rates. All Maryland children would benefit from increased competition from private schools.
- The beneficial effect of private school competition on public schools is large enough that even a modest school choice program could save Maryland taxpayers millions of dollars each year. For example, a 6 percent increase in Maryland's statewide graduation rate would save Maryland taxpayers more than \$5 million a year.

About the Author

Justin P. Hauke is a securities analyst working in Chicago. He previously worked as an economic research analyst at the Federal Reserve Bank of St. Louis, where he helped develop econometric financial models and assisted with the bank's monetary policy research. He later joined the Show-Me Institute, a Missouri-based free market think tank, where he conducted studies on Missouri education and tax policy. He has testified before the Missouri General Assembly on the economic impact of school choice programs. His research on Missouri public policy has been covered in newspapers across the state, including the *St. Louis Post-Dispatch*, the *Kansas City Star* and the *Columbia Daily Tribune*. He holds a bachelor's degree in economics and mathematics from the University of Texas at Austin and a master's degree in finance from Washington University in St. Louis.

Friedman Foundation for Educational Choice



The Friedman Foundation for Educational Choice, dubbed "the nation's leading voucher advocates" by the Wall Street Journal, is a nonprofit 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.

Maryland Public Policy Institute



Founded in 2001, the Maryland Public Policy Institute is a nonpartisan public policy research and education organization that focuses on state policy issues. Our goal is to provide accurate and timely research analysis of Maryland policy issues and market these findings to key primary audiences.

Acknowledgements

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Introduction

Education reform is a crucial issue in Maryland. State lawmakers have taken steps to reexamine the declining graduation rates of the state's public schools in the face of decreasing public education performance. In the 2008 legislative session, several bills were introduced to address education accountability and to provide more educational options. Recent studies by the Maryland Public Policy Institute have helped document the decline in Maryland public education and have raised public awareness of the need for school choice reform.¹

The individual consequences of not completing high school—lower wages, higher unemployment rates, etc.—are clear. But less emphasis has been placed on the cost to society of declining graduation rates. A growing number of high school dropouts have both direct and indirect fiscal effects on Maryland taxpayers. Lower rates of labor-force participation, higher rates of unemployment and lower wages and salaries of those employed all are consequences of the failure of individuals to obtain a high school diploma. These consequences affect *all* Maryland residents, depressing overall wage and job growth and imposing a fiscal drag on state expenditures associated with increased spending on social programs. Higher levels of education lead to positive effects on society in the form of reduced levels of public welfare programs, better health, lower crime rates and increased productivity.

Little effort has been made to estimate the actual cost of Maryland high school dropouts beyond the traditional costs attributable to each individual dropout. Policy-makers agree that the general public must have a better understanding of the costs of the current system and of the myriad education reforms proposed.

This study addresses several critical education reform issues pertinent to the Maryland debate. By estimating some of the public costs associated with declining graduation rates, this paper ideally will serve as a catalyst for education reform by highlighting the fiscal consequences of inaction. This study will also document the improved fiscal and social outcomes associated with existing private school competition and the likely outcomes of expanded school choice in Maryland.

Previous research has found that school choice programs are effective in saving taxpayer money as well as expanding existing opportunities for children with the greatest educational needs. One analysis found that \$444 million was saved nationally from 1990 to 2006 because of school choice programs.² Existing tax-credit scholarship programs have been shown to save taxpayers in Pennsylvania, Arizona, Florida and elsewhere millions of dollars annually.³ This study explores how expanded school choice may benefit Maryland taxpayers by improving high school graduation rates and reducing expenditures on social welfare programs, freeing up additional resources to be used toward educating students who remain in the public school system.⁴

Dropouts in Maryland: An Urgent Problem With Serious Consequences

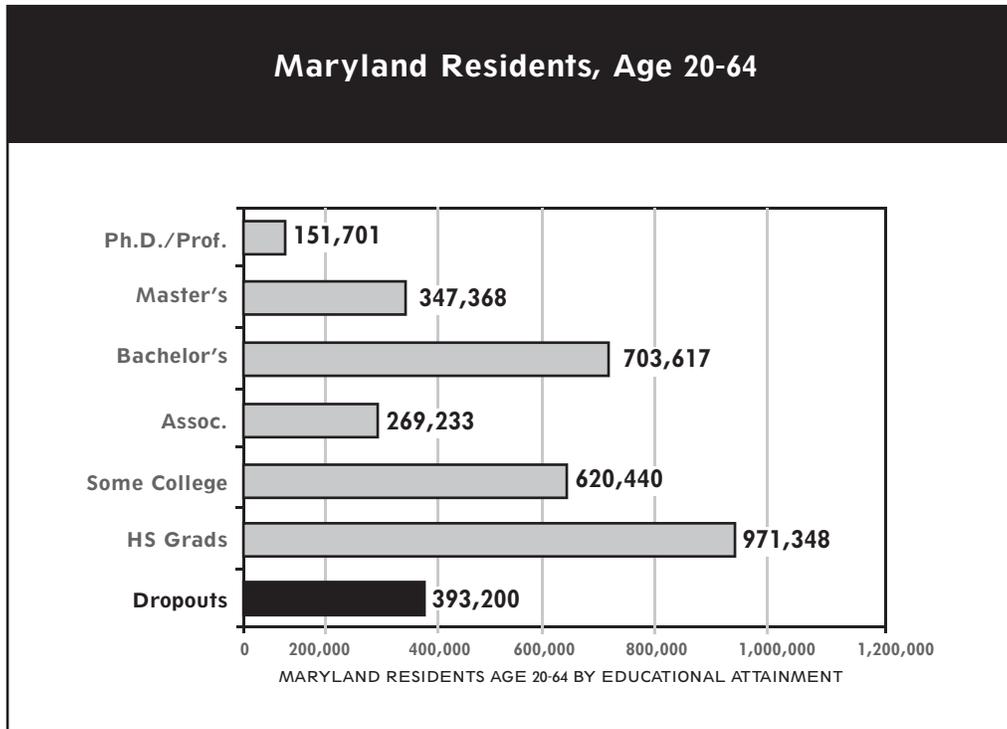
Over the past decade, increased attention has been focused on the declining graduation rates of America's public high schools. Last year, the Editorial Projects in Education Research Center released a database of new high school retention figures that highlighted the extent of this problem and the degree to which many states have been underreporting official dropout rates.

The data show that only 70 percent of high school students nationwide graduate from high school. More than half of these dropouts come from large urban "dropout factory" districts—including Baltimore—that have graduation rates below 50 percent. In fact, the Baltimore city school district, at 35 percent, has one of the lowest graduation rates in the country, ranking 98th among the nation's 100 largest urban school districts.⁵ U.S. Secretary of Education Margaret Spellings said of the data:

We are finally moving from a state of denial to a state of acknowledgment [regarding high school graduation rates]. It's hard to believe such a pervasive problem has remained in the shadows for so long.⁶

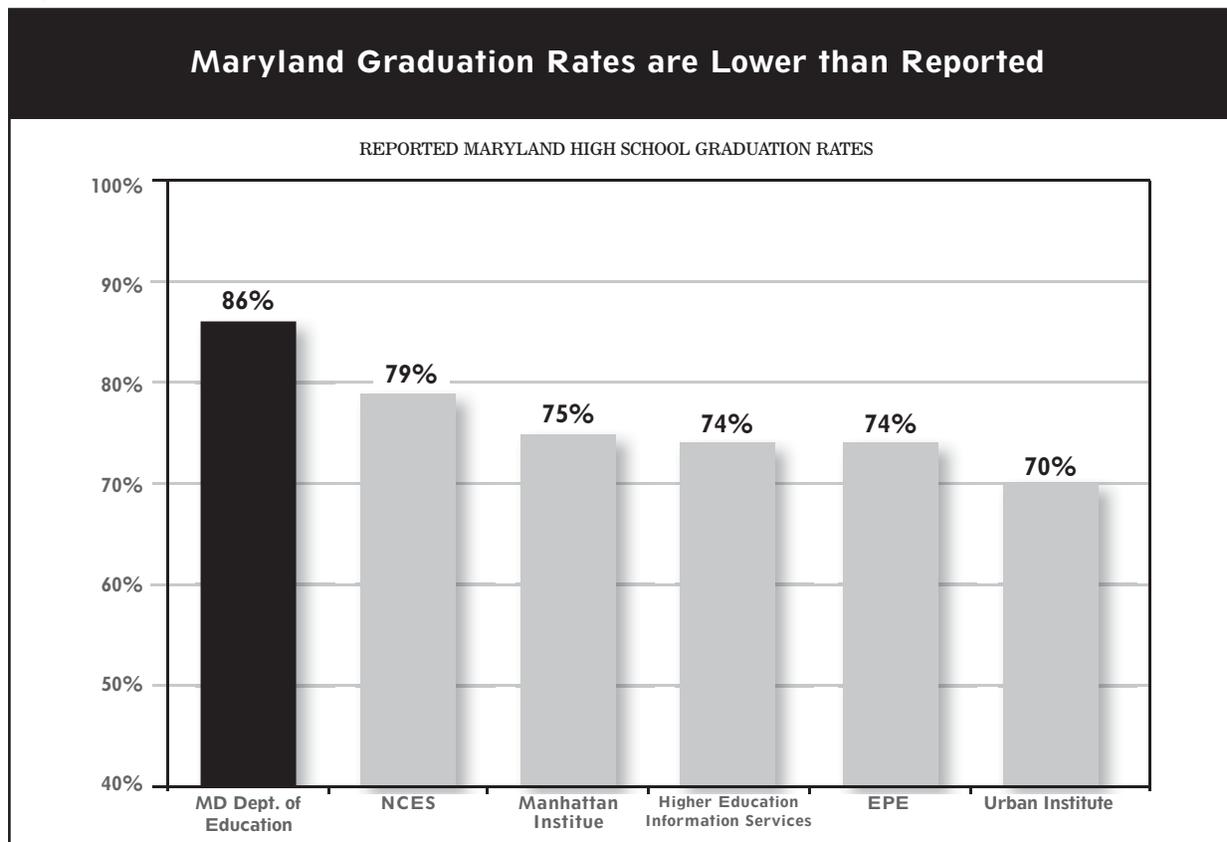
If current dropout rates continue, more than 50,000 of the 80,000 students who attend Baltimore city schools will fail to graduate. Currently, nearly 12 percent of Maryland's working-age adults are high school dropouts. Figure 1, which shows the number of Maryland residents ages 20-64 (i.e., working age) by educational achievement, indicates that 393,200 adults across the state do not have a high school diploma.⁷

Figure 1



Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Figure 2



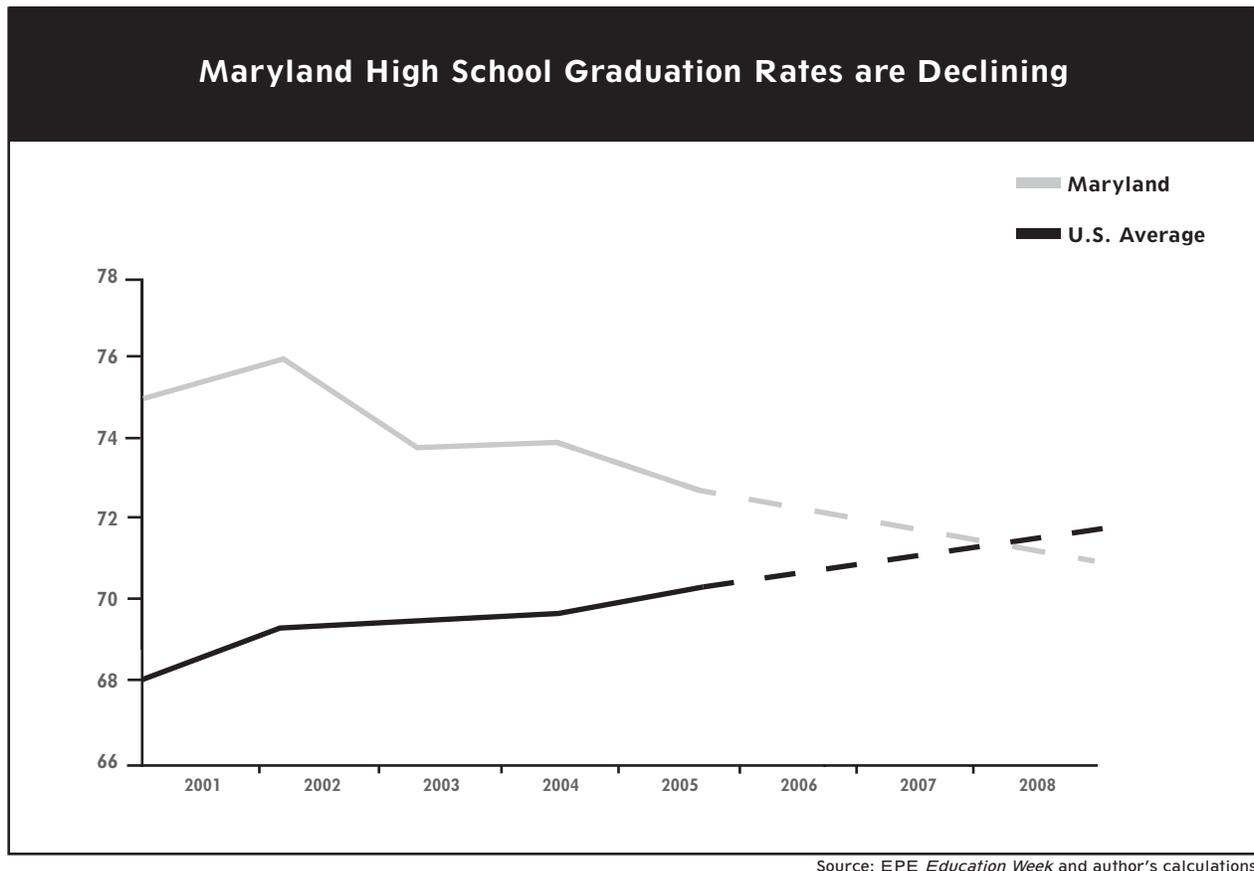
Source: Maryland State Department of Education and independent research organizations

Moreover, many states and school districts significantly over-report their actual high school graduation rates, so the numbers reported in Figure 1 likely are understated. In Maryland, for example, state officials measure graduation rates based on the number of students who have officially dropped out of school. This method is accepted by the federal government for compliance with the No Child Left Behind Act but has been criticized by academic researchers. Maryland counts students as dropouts only if they officially register their withdrawal with the individual school in which they were enrolled. These official withdrawals are accepted only if a parent has consented or the student is 18 or older. Consequently, official withdrawals are rare and most "official" state graduation rates are biased upward.

Figure 2 compares Maryland's officially reported high school graduation rate for the 2004-2005 academic school year with those of various independent educational research groups.⁸ Independent estimates by the National Center for Education Statistics, the Manhattan Institute, the Higher Education Information Service, the Editorial Projects in Education Research Center (EPE) and the Urban Institute all indicate that Maryland's graduation rates are much lower than officially reported. An average of these estimates puts Maryland's graduation rate at close to 75 percent, more than 10 percentage points lower than the rate officially reported by the Maryland Department of Education.⁹

The EPE, known for the accuracy of its graduation rates, developed estimates for Maryland using a method known as the "cumulative promotion index," which seeks to track student progress through the education system over time.¹⁰ Figure 3 uses estimates from the EPE data to highlight the decline in Maryland's high school graduation rate from 2001 to 2006. Although more recent figures are not yet available, a regression of Maryland's graduation rates since 1995 against a linear time trend suggests that the state's graduation rate is declining at a rate of 0.54 percent a year. Such a decrease would suggest that Maryland's current graduation rate is likely below that of the national average.

Figure 3



Dropouts Cost Maryland Taxpayers Millions Every Year

It is well documented that the level of education achieved is an important predictor of an individual's future economic

success. For the nearly 400,000 Maryland residents 20 to 64 years old who lack a high school diploma, the consequences of dropping out of school are clear. In 2007, 58,178 Maryland students graduated from high school. An estimated additional 26,997 students should have graduated. The annual increase in high school dropouts highlights the importance of educational reform and the continual drain on public resources incurred by the state's declining graduation rate. This section will document some of the individual consequences of dropping out of high school.

Table 1 summarizes the effect of different levels of education on Maryland residents. The table indicates that residents without a high school diploma are less likely to be in the labor force and are more likely to be unemployed. These individuals earn significantly less each year than high school graduates and are more likely to collect Medicaid benefits for themselves or a dependent child. Dropouts are also more likely to be incarcerated than high school graduates.

Table 1

Maryland Life Outcomes by Educational Achievement (Age 20-64)							
	Dropouts	HS Grads	Some College	Assoc. Degree	Bachelor's Degree	Master's Degree	Ph.D./Prof.
Percent in labor force	68.8%	79.9%	75.7%	84.0%	85.9%	88.9%	80.7%
Unemployment rate	7.8%	4.0%	5.1%	2.7%	1.8%	0.3%	3.4%
Annual earnings, total (gross)	\$16,570	\$26,216	\$28,415	\$35,271	\$51,732	\$66,466	\$38,580
Percent on Medicaid or with child on Medicaid	23.3%	17.7%	12.1%	10.4%	5.0%	3.2%	13.1%
Incarceration rates (males only)							
White	0.93%	0.39%	0.27%		0.08%		
Hispanic	2.00%	1.2%	NA		NA		
African-American	4.11%	2.35%	2.15%		0.75%		
						ALL COLLEGE GRADS COMBINED	

Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

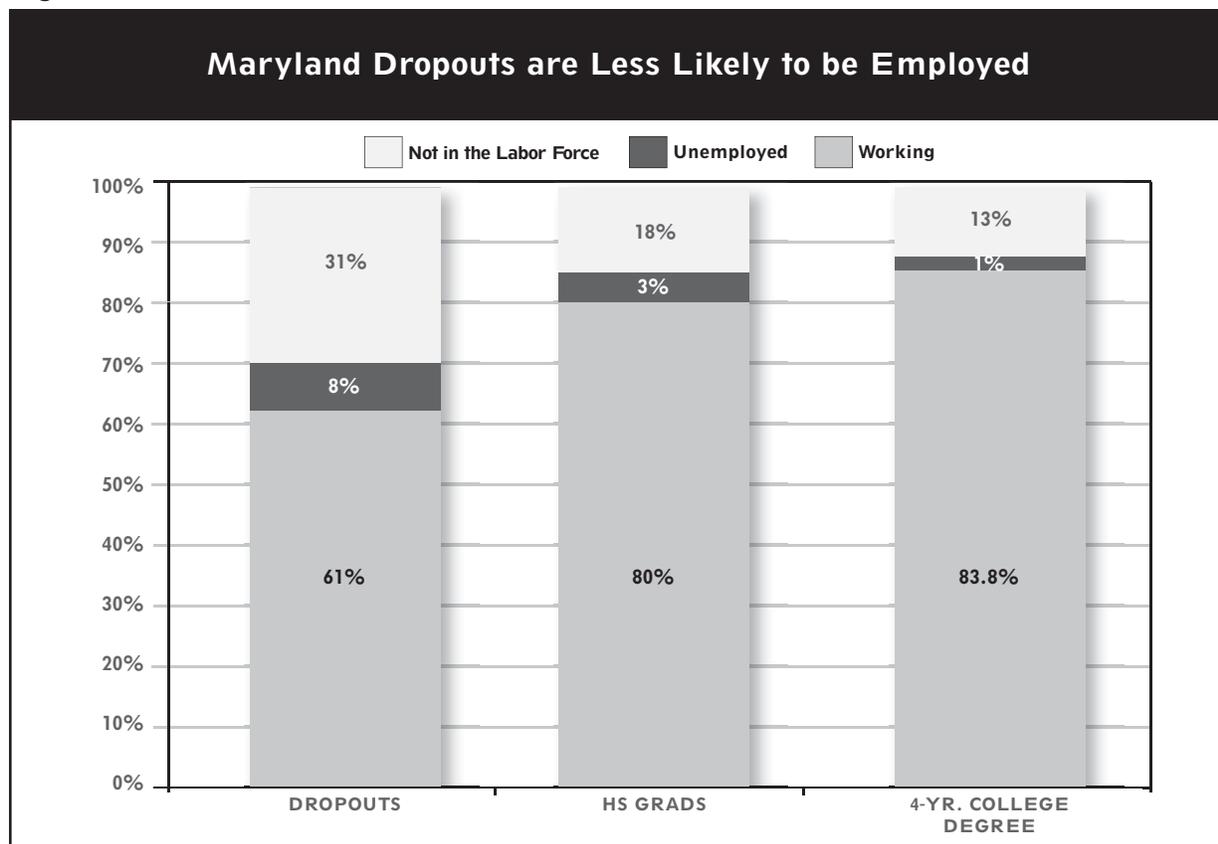
Maryland Dropouts Earn \$10,000 Less Each Year

Figure 4 shows that high school dropouts are less likely to be in the labor force (working or looking for work) than those with higher education attainment. Dropouts who are in the labor force have the highest level of unemployment. The chart indicates that only 61 percent of high school dropouts are employed, while 31 percent are either unable to work or have stopped looking for work (and thus considered to be out of the labor force) and nearly 8 percent are unemployed.¹¹ Figure 5 indicates that high school dropouts are nearly twice as likely to be unemployed as high school graduates. The unemployment rate for high school dropouts in Maryland is 8 percent, compared to the state average of 3 percent.¹²

Figure 6 demonstrates the relationship between educational achievement and employment compensation in Maryland. A high school dropout can expect to earn nearly \$10,000 less per year than a high school graduate. The wage difference between higher levels of educational achievement reflects the consequences of lower-paying jobs, lower labor-force participation and lower employment rates of high school dropouts.

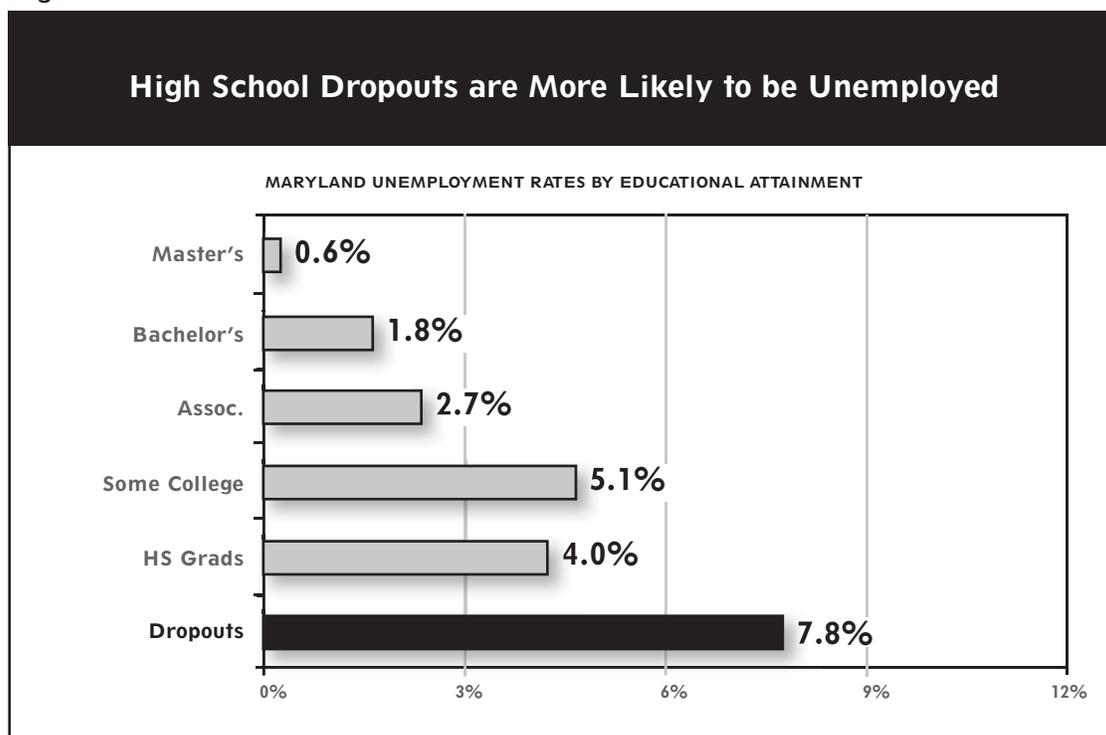
The difference in annual earnings between high school dropouts and high school graduates in Maryland suggest that state income was nearly \$4 billion less than it would have been otherwise had each of its working age adults earned a high school diploma.

Figure 4



Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Figure 5



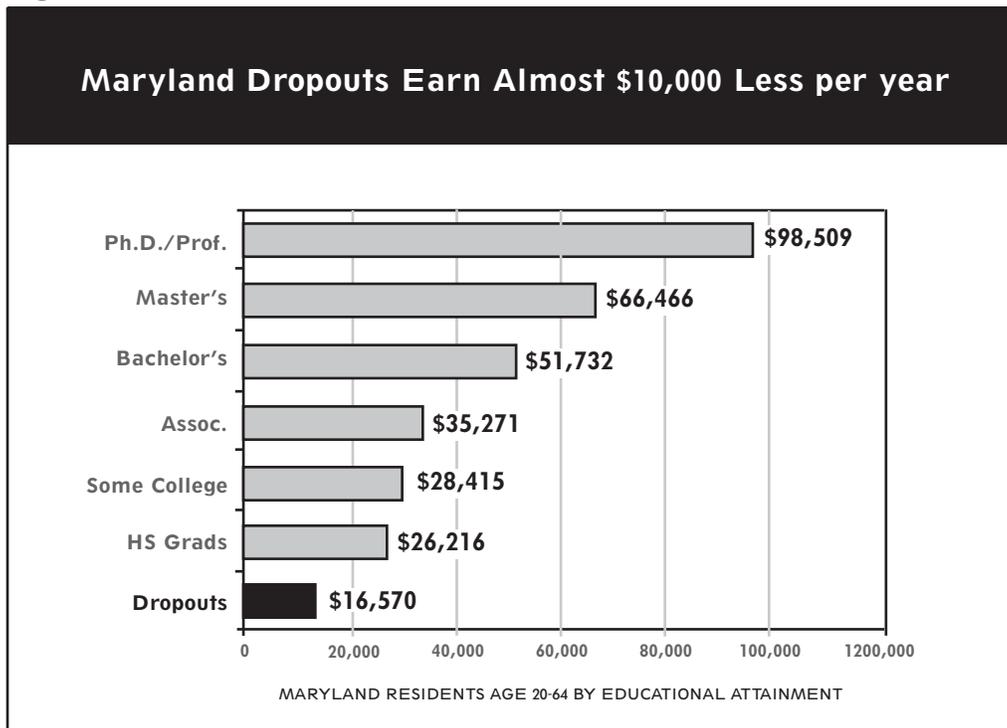
Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Lower Earnings Reduce Dropouts' Lifetime Earnings Potential by \$150,000

One of the most important concepts in economics is the power of compound interest. Small savings that earn modest

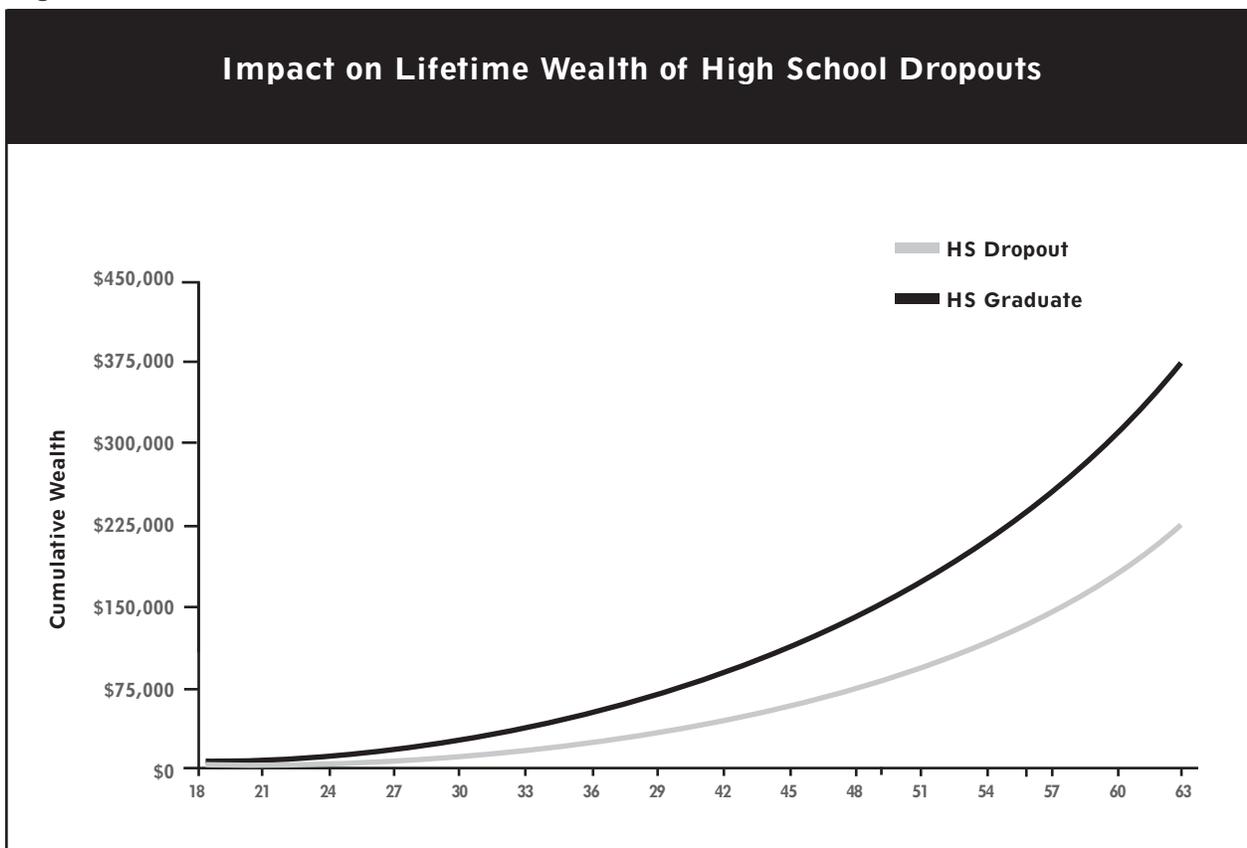
rates of interest over 40 or 50 years can translate into sizable sums. Therefore the earnings disparity illustrated in Figure 6 becomes even more dramatic once we consider the effect over a high school dropout's lifetime.

Figure 6



Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Figure 7



Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Figure 7 plots the potential increase in accumulated lifetime wealth of a high school graduate, compared to that of a high school dropout. In both cases, it is assumed that the individuals begin their working career at age 18 and retire at age 65, earning the average annual salary of their demographic (i.e., \$16,570 for high school dropouts and \$26,216 for high school graduates) every year. In addition, it is assumed that both individuals are able to invest 5 percent of their gross income every year in a benchmark 70/30 stock/bond portfolio earning the historical rate of return.¹³ Ignoring the impact of taxes and inflation on the portfolios, the increased wages of high school graduates translate into more than \$150,000 in expected lifetime wealth potential than the portfolios of high school dropouts. A Monte Carlo simulation of the returns suggests that a high school graduate is 71 percent likely to accumulate more than \$100,000 in lifetime wealth than a high school dropout.¹⁴

A more profound effect is the lifetime impact of a single high school dropout on the Maryland economy. Over the course of a high school dropout's working career, the multiplier impact of the foregone \$10,000 in additional annual income translates into more than \$3 million in lost revenues. This \$3 million could have been reinvested in the Maryland economy, fueling job and wage growth and overall productivity. Furthermore, Table 2 suggests that the aggregate annual income lost by Maryland's 393,200 working-age high school dropouts amounts to \$3.8 billion in lost wages every year.

Table 2

Impact of Maryland High School Dropouts on State Income (Age 20-64)				
Education Level	Population	Average Earnings	Total Earnings (\$ millions)	No Dropouts [All Become HS Grads] (\$ millions)
Dropouts	393,200	\$16,570	\$6,515	\$0
HS Grads	971,348	\$26,216	\$25,465	\$35,772
Some College	620,440	\$28,415	\$17,630	\$17,630
Associate's Degree	269,233	\$35,271	\$9,496	\$9,496
Bachelor's Degree	703,617	\$51,732	\$36,399	\$36,399
M.A./Ph.D./Prof.	499,069	\$76,206	\$38,032	\$38,032
Total	3,456,907	\$38,629	\$133,537 million	\$137,330 million
			Difference	\$3,793 million

Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Dropouts Reduce Maryland Tax Revenues by \$193 Million a Year

The higher incomes of high school graduates described above have significant public consequences as well. Better-educated individuals increase the productivity of Maryland's economy and their contributions create a larger tax base. Higher graduation rates would provide additional tax and fee revenues to state and local governments.

Data on the average earnings of working-age Maryland high school dropouts and graduates from the March CPS Supplement for 2006 and 2007 were used to calculate hypothetical tax liabilities using the "TAXSIM" model. This model, developed by the National Bureau of Economic Research, estimates a taxpayer's federal and state income tax liabilities. Because of the complexity of the Maryland tax code, however, several simplifying assumptions were made to facilitate the analysis and to provide direct comparisons.

Without data on spousal income, all taxpayers were treated as single taxpayers. This analysis also assumed that no

taxpayers took advantage of idiosyncratic tax exemptions or credits (e.g., student loan interest or environmental tax credits). Because data on the individual taxpayers' mortgage interest or property tax deductions were not available, it also was assumed that taxpayers were not homeowners. All income was treated as wage income since dividend, capital gains and interest income are taxed differently. The 2006 tax year was used as our basis, as it provides the most recent data.

State tax liabilities were calculated for taxpayers with and without dependent-child exemptions and the number of returns were weighted according to the percentage of dropouts with and without dependent children, as indicated by Current Population Survey data.¹⁵ Although these are not precise tax liabilities, the TAXSIM estimates approximate the first-order effects of the tax cost of high school dropouts. As a result, the difference from the true income-tax costs associated with the earnings differential should be insignificant.

Table 3 summarizes the lost tax revenues associated with Maryland's high school dropouts. The income tax figure was calculated by computing the difference between graduate and non-graduate tax liabilities and then multiplying this difference by the number of working-age high school dropouts. The sales tax revenue was approximated based on the empirical data that show about 70 percent of Marylanders' gross income is spent on consumption goods, of which about 50 percent are subject to sales tax.¹⁶ The difference in gross income between dropouts and high school graduates was multiplied by this approximation based on the state sales tax rate of 6 percent.¹⁷

Table 3 indicates that the lower earnings of Maryland's working-age dropouts result in state income tax revenues that are \$113 million lower than they would be if all residents had obtained at least a high school diploma. The total annual tax revenue loss associated with the state's existing high school dropouts is about \$193 million (or about \$490 per dropout), including \$80 million in lost sales tax revenue. This amounts to about 5 percent of the state's total 2007 general revenue education appropriation.¹⁸

Table 3

Cost of Maryland High School Dropouts on State Tax Revenues				
	Total Income	Dependent Exemptions		
		No Children	1 Child	2 or More Children
HS Grads	\$26,216	\$983.76	\$404.40	\$0
Dropouts	\$16,570	\$525.58	\$0	\$0
	Difference	\$458.18	\$404.40	
	X			
	Dropouts	131,065	131,065	131,065
Lost Income Tax Revenue		-\$64,618,586	-\$54,411,730	-\$30,527,126
		Total Lost Income Tax Revenue:		\$112,942,430
		Other Lost Tax & Fee Revenue:		\$79,648,951
		Total Annual Revenue Loss:		\$192,591,381

Source: National Bureau of Economic Research TAXSIM model and author's calculations

Dropouts Have Poorer Health and Are More Likely to Use Medicaid

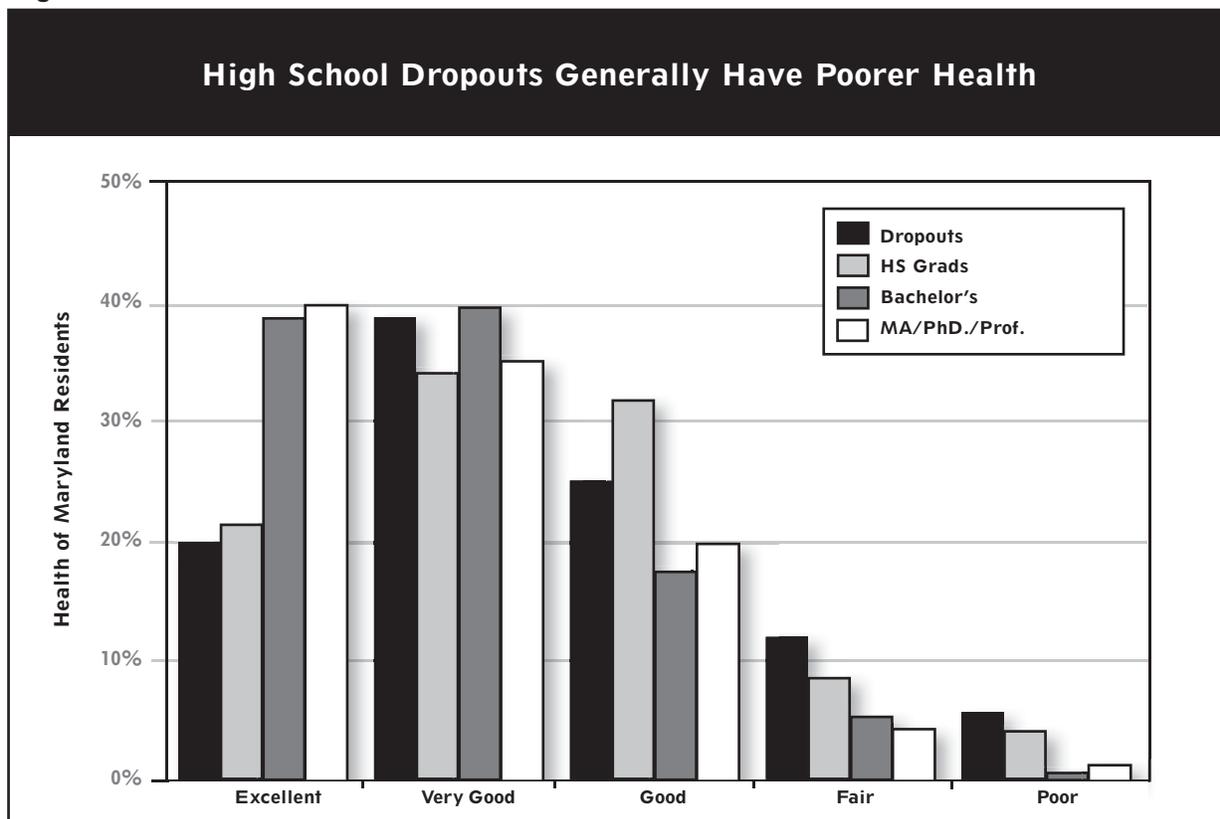
Maryland residents who fail to obtain a high school diploma are at a much greater risk of reliance on safety-net programs such as Medicaid, Temporary Assistance to Needy Families, housing assistance and food stamps. The probability of being a beneficiary of one or more public-assistance programs increases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

Dropouts increase the cost of state and federal health care programs because they are less likely to be covered by employers' health insurance or other privately provided programs. This is due to the fact that dropouts are less likely to be employed and

their low income levels qualify them for public welfare assistance. Moreover, uninsured dropouts increase health care premiums for all Marylanders by increasing the percentage of “uncompensated care” throughout the health care system. Uncompensated care increases the cost of health insurance premiums because it shifts the burdens of health care costs for those who can't afford insurance onto the individuals and providers who pay for health care coverage.

Figure 8 confirms that dropouts are a bigger health liability than Maryland residents with higher levels of educational achievement. Working-age dropouts in Maryland are, on average, in poorer health than the average state resident. Because high school dropouts are more likely to use public welfare programs to treat their health problems (discussed below), the general ill health of Maryland's dropouts translates indirectly into higher costs for the health care system in Maryland in general.

Figure 8



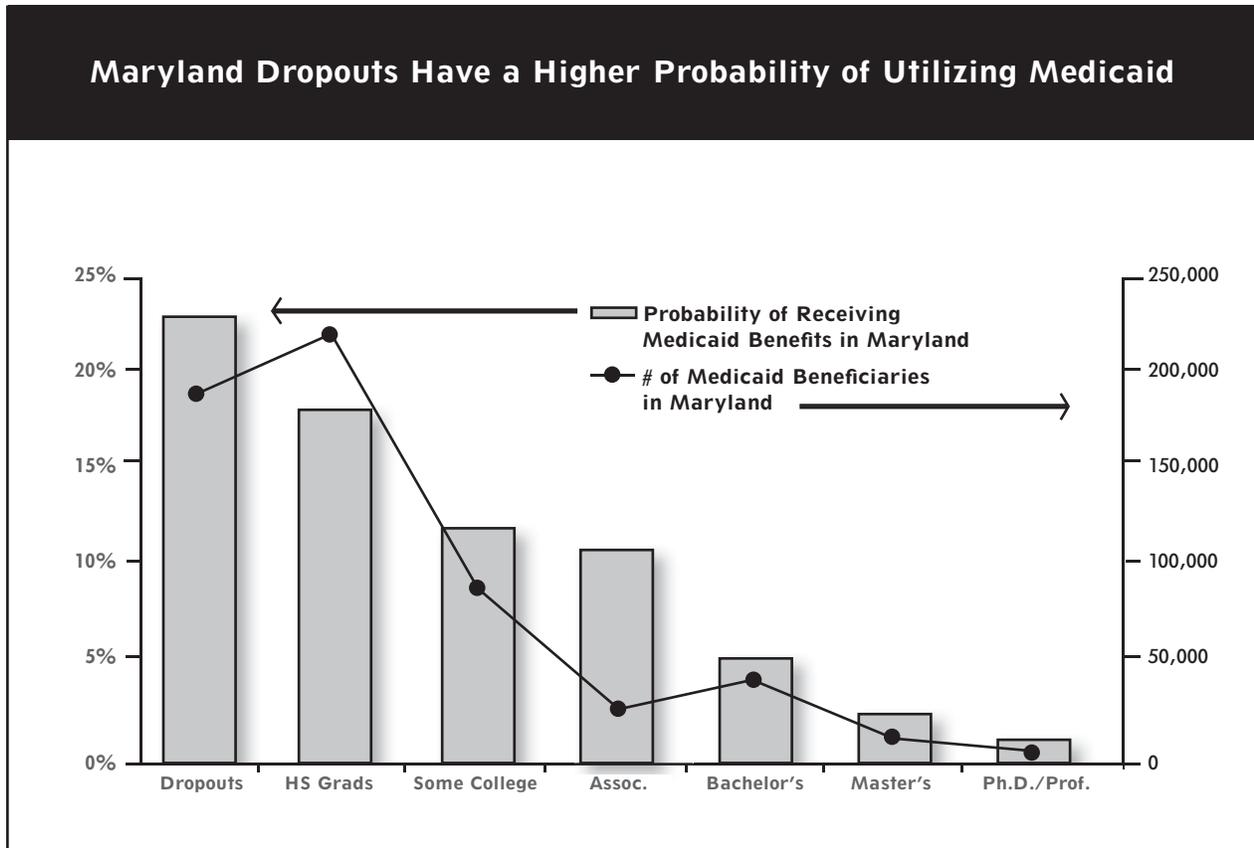
Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Perhaps the most direct public cost of dropout health care, however, is the impact that dropouts have on the state share of Medicaid contributions. More than 709,000 state residents received some form of Medicaid compensation in 2007, for a total federal and state cost of \$5 billion (or an average of \$7,334 per recipient). Medicaid costs are shared between the state and federal governments, with the state of Maryland paying about half the cost in 2007.¹⁹ About 13 percent of Maryland's adults were enrolled in one or more Medicaid benefit programs in 2007, making health care expenditures the second-largest gross spending category by the Maryland state government.

Educational achievement and the probability of receiving Medicaid assistance are closely associated. Figure 9 provides a breakdown of Medicaid recipients by educational achievement and the resulting probability of receiving Medicaid assistance. The chart suggests that dropouts have a 23 percent probability of receiving Medicaid assistance. This probability drops to 17 percent for high school graduates and to less than 2 percent for Marylanders with post-graduate degrees. More than 200,000 Maryland dropouts receive Medicaid assistance, composing more than a quarter of the state's total Medicaid patients.

The CPS often underestimates the number and percentage of public-assistance recipients because of limitations on the individuals included in its samples.²⁰ As a result these costs should be seen as conservative.

Figure 9



Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

Table 4

Cost of Maryland High School Dropouts on State Medicaid Costs (all dollar figures in millions)									
	Population	Percent On or w/ Child on Medicaid	Number On or w/Child on Medicaid	Total Cost = Recipients x Average Cost	State Share of Costs	Number on Medicaid if All Graduated	Total Cost = Recipients x Average Cost	State Share of Medicaid Costs	
Dropouts	393,200	12.34%	48,525	\$356M	\$178M	0	\$0	\$0	
HS Grads	971,348	6.54%	63,536	\$466M	\$233M	89,255M	\$655M	\$327M	
Some College	620,440	4.26%	26,424	\$194M	\$97M	26,424M	\$194M	\$97M	
Associate's Degree	269,233	2.31%	6,226	\$46M	\$23M	6,226M	\$46M	\$23M	
Bachelor's Degree	703,617	1.40%	9,867	\$72M	\$36M	9,867M	\$72M	\$36M	
Post-graduate degree	499,069	0.48%	2,381	\$17M	\$9M	2,381M	\$17M	\$9M	
Total	3,456,907		156,959	\$1,151M	\$56M	134,153M	\$984M	\$492M	
	Annual Medicaid Cost of Dropouts						22,806M	\$167M	\$84M

Source: U.S. Census Current Population Survey, March Supplement (2006, 2007) and author's calculations

To estimate the Medicaid costs associated with Maryland's high school dropouts, we used CPS data to estimate the likelihood of an individual receiving Medicaid benefits. We then considered the difference in Medicaid recipients if all high school dropouts instead had received a diploma. The decline in Medicaid recipients was multiplied by the state's average cost of Medicaid funding, not including the costs of elderly and disabled recipients—who put the greatest costs on the system—or administrative costs.

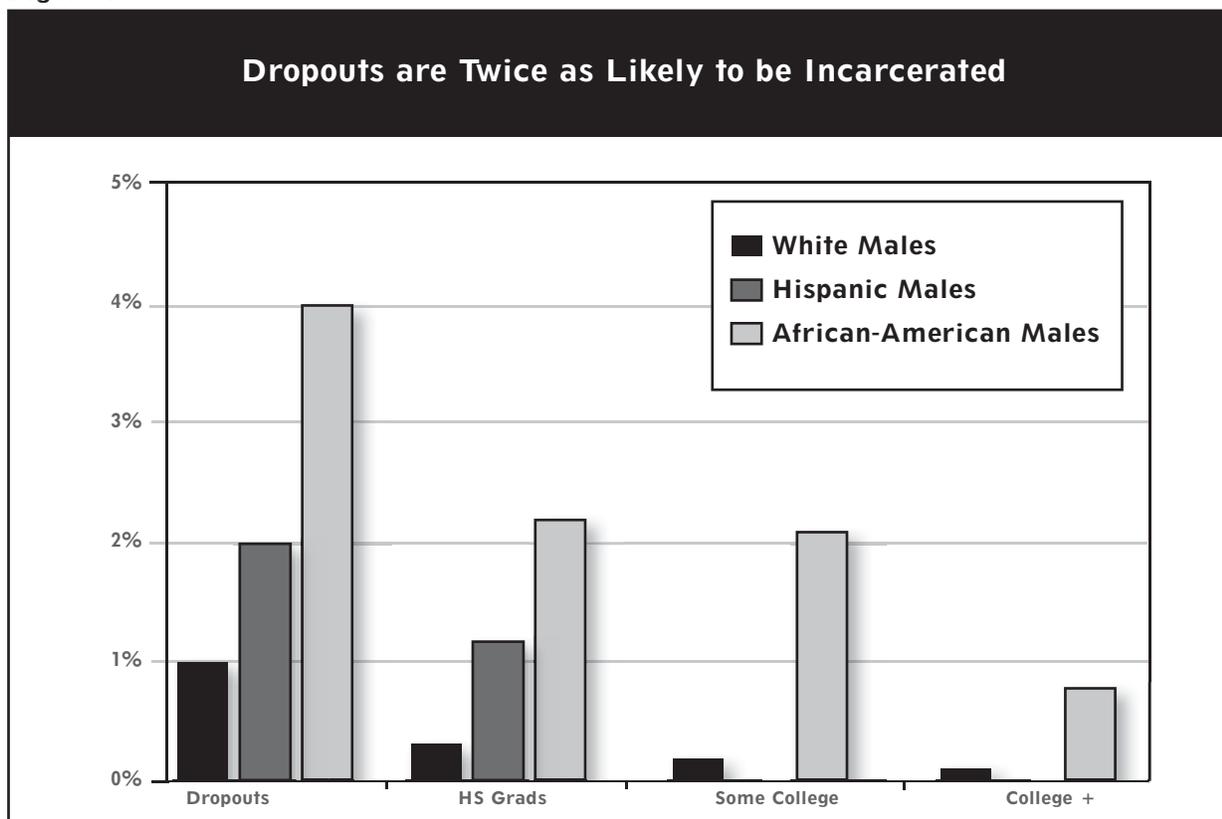
Table 4 presents an estimate of the corresponding reduction in state Medicaid costs associated with a zero dropout rate. This table suggests that, if all working-age Maryland dropouts had received a high school diploma instead of dropping out of school, Maryland would have 22,806 fewer Medicaid recipients and save \$82 million a year. However, because the CPS is known to underestimate the true number of Medicaid recipients, these figures should be seen as conservative.

Maryland Dropouts Are Twice as Likely to Be Incarcerated

Maryland spent about \$1 billion, or 4 percent of the state budget, on criminal-incarceration costs in 2008. The state's total incarceration costs average \$31,200 per inmate a year (\$6,312 of which is spent on variable costs e.g., food and medical costs), making the state one of the more expensive prison systems in the country.²¹

Although the probability of any one high school dropout being incarcerated is small, it is twice as high as it would be if the individual had earned a high school diploma. Our study estimated the incarceration costs associated with high school dropouts by relying on the difference in probability of being incarcerated associated with higher levels of educational achievement. Because of data limitations associated with incarceration rates, we were able to consider only the impact of male incarcerations in the cost estimates. The Maryland corrections system is populated primarily by males (about 85 percent), so this assumption will have little impact on the implied cost estimates.²² Figure 10 shows the probability of white, Hispanic and African-American male dropouts being incarcerated at some point during their lifetime.

Figure 10



Note: Data were unavailable for Hispanics with postsecondary education. Incarceration rates provided by Lochner and Moretti (2001).

Since the CPS does not survey incarcerated or institutional participants, we relied on indirect estimates of Maryland criminal activity and incarceration rates from previous research.²³ These estimates determined the likely number of Maryland dropouts from the 2007 graduating class who could be expected to be incarcerated at some point during their working-age lifetimes. We used data on the types of crime, average sentence length and average sentence served to construct a “weighted average” sentence that reflects the expected length of incarceration per incident.²⁴ This weighted average calculation suggests that the average prison time served per conviction is 7.5 years. This number was multiplied by the average annual variable cost per inmate (\$6,312), and then multiplied again by our expected number of incarcerations.

Like the Medicaid cost estimates, this cost calculation can be interpreted as conservative since it ignores many of the actual public costs of crime, such as the additional policing costs imposed on society and the administrative and capital costs associated with the criminal justice system in general. Moreover, these estimates do not consider the actual property, emotional and physical damages resulting from individual crimes.

To account for the additional recidivism cost of crime—the tendency of convicted criminals to offend again—the final costs were multiplied by 0.6. The recidivism cost has been noted to be a particularly important cost factor in studies on the societal impact of crime.²⁵

Table 5

Academic School Year		2007
Total Graduates		58,168
Dropouts		26,997
Graduation Rate (All Races Combined)	68.30%	
African American Male	61.60%	
Hispanic Male	63.30%	
White Male	80.30%	
Number of African-American Dropouts		13,815
Percentage of African-American Dropouts		38.10%
Number of Hispanic Dropouts		2,799
Percentage of Hispanic Male Dropouts		8.30%
Number of White Dropouts		6,821
Percentage of White Male Dropouts		47.80%
Expected Incarcerations from Dropouts		
African-American		568
Hispanic		56
White		63
Total Incarcerations		687
Expected Incarcerations for w/out Dropouts		
African-American		325
Hispanic		34
White		27
Total Incarcerations		385
Projected Incarceration Costs (\$ million)		\$52.33 M
Projected Incarceration Costs no Dropouts (\$ million)		\$29.30M
Difference		\$23.02M
Incarceration Cost per Dropout		\$853

Source: Lochner and Moretti (2001) and author's calculations

Table 5 estimates the impact dropouts have on annual incarceration costs. Because Maryland does not report dropout rates by race, sex or ethnicity, we used the independent estimates reported by the Editorial Projects in Education Research Center.²⁶ This provided a basis for calculating the number of male dropouts for each demographic based on the composition of the graduating student body as a whole.²⁷ The next step was to calculate the probability of incarceration in any given year for each dropout of the graduation class, producing an estimate of the total number of expected incarcerations each year. These estimates were compared with estimates of the expected number of incarcerations had each high school dropout graduated instead.

Table 5 shows that the 2007 class of dropouts is expected to produce 687 incarcerations each year over the course of the class's working career (about 50 years). However, if each of those dropouts had graduated instead, Maryland could expect only 385 incarcerations per high school class. This reduction in incarcerations would translate to savings of about \$23 million annually, or about \$853 per dropout. As the size of the dropout cohort increases, these costs will increase.

Maryland Spends \$1,555 on Each Dropout Every Year

The sections above document some of the most direct costs associated with high school dropouts. An estimated 26,997 Maryland students failed to graduate from high school in 2007. Some of these dropouts will incur public costs amounting to tens of thousands of dollars while others may incur very little or no direct costs on Maryland taxpayers. To account for these differences, the costs associated with high school dropouts can be averaged across the entire dropout population to arrive at an average expected cost per dropout.

Table 6

Maryland Annual and Lifetime Costs per Dropout	
Lost state tax revenue	\$ 490
Incarceration costs	\$ 853
Medicaid costs	\$ 213
Annual state cost per dropout	\$ 1,555
Lifetime cost per dropout *	\$ 35,180

* Lifetime cost per dropout expressed in present value

Table 6 summarizes the “per dropout” costs associated with lower tax revenues, higher Medicaid spending and additional incarceration costs. These figures suggest that each high school dropout will cost Maryland taxpayers \$1,555 a year, incurring total lifetime costs of \$35,180 (in present value).²⁸ This results in an annual \$50 million social cost liability for the entire class of 2007 dropouts.

It is important to note that these cost estimates should be considered a conservative benchmark; the true costs associated with Maryland's high school dropout rate are much higher. The costs considered for this study are associated only with reduced tax revenue and higher spending on Medicaid and incarceration, not those associated with a slower economic growth rate or those paid by Marylanders indirectly or by the federal government.

The Public Benefits of School Choice in Maryland

Advocates of competition in education generally believe that not only will children who participate in school choice programs benefit, but that the overall productivity of public schools subjected to competition will increase as well. Nevertheless, most research on school choice initiatives focuses specifically on the effects on students participating in school choice programs. A more complete characterization of the effects of school choice, however, would include the impact on public schools. As this study has highlighted, the public costs associated with high school dropouts in Maryland are significant. Therefore, if competition from private schools leads

to higher public school graduation rates, the resulting public benefits will be significant. This section attempts to assess the potential impact of a modest school choice program in Maryland.

Private School Competition Improves Public School Graduation Rates

Assessing the impact of competition from private schools on nearby public school graduation rates require sophisticated statistical methods.²⁹ 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 typically do not appear randomly; rather, the demand for private schools arises partly in response to public school quality. In statistical 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 public 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.

But some studies *have* employed adequate methods and provide a growing body of evidence that competition from private schools improves achievement in neighboring public schools. Caroline Hoxby provides a review of this evidence.³⁰ Perhaps the best-designed study was conducted by Thomas Dee,³¹ who 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.” Dee's results indicate that an increase in the percentage of students enrolled in private schools equal to one standard deviation (or about 6 percentage points of total enrollment in Maryland), is associated with a 1.7 percent decline in the overall public school dropout rate and a 3.4 percent decline in districts where at least 20 percent of students are non-white.

About 17.5 percent of Maryland students (or 178,081 students) are enrolled in private schools. However, there are large discrepancies in private school enrollment among Maryland counties. For example, only 9 percent of students in Queen Anne County are enrolled in private schools while more than 25 percent of students in Talbot County are so enrolled. In general, the percentage of students enrolled in private schools is higher in larger communities, with a standard deviation of enrollment among Maryland counties of 6 percent.³²

Uncertainty about the accuracy of Maryland's district-reported graduation rates (as discussed above) makes it difficult to perform an analysis of the relationship between competition in education and public school graduation rates. Therefore, we employed a range of estimates produced by research conducted in other states and nationally.³³ This created an estimate that private school enrollment causes public school graduation rates to increase 2.4 percentage points (low impact) to 4.8 percentage points (high impact) for every one standard deviation (6 percent) increase in Maryland private school enrollment. These estimates fall between the national results obtained in Dee's study for other states.

School Choice Programs Could Save Maryland Taxpayers Millions of Dollars

The previous sections detailed the public costs of Maryland dropouts. Therefore we can assess the impact of improved public school competition on state graduation rates to determine the cost benefits of an expanded school choice program in Maryland. Based on our estimates of per-student dropout costs and national estimates of the impact of private school enrollment on public school graduation rates, we found that increasing the total number of Maryland students enrolled in private schools by 6 percent (60,888 students) would create:

- A statewide reduction of between 2,891 and 5,592 high school dropouts each year, based on the low- and high-impact estimates suggested by the positive benefits of increased public school competition.
- Combined public savings and increased revenue of \$4.5 million to \$9 million a year, the result of increased tax revenues and lower Medicaid and incarceration spending. As mentioned above, the annual savings likely would be even larger since high school dropouts have many additional social costs other than those considered above.
- Total public benefits of \$270 million to \$522 million over an expected lifetime of 60 years for each class of dropouts, based on average annual savings projections. The present value of these lifetime benefits, discounted at 4 percent each year (10-year

Treasury yield), is \$102 million to \$197 million, or about \$93,300 (\$35,180 in present value) in lifetime savings per dropout.

Table 7 summarizes the public benefits associated with an expanded school choice program in Maryland. The savings realized ultimately depend on the size of the school choice program; that is, as the role of school choice is expanded, the annual social benefits will be greater. Moreover, many school choice programs have been shown to have direct fiscal benefits that are independent of the reduction in the number of public school dropouts.³⁴ Thus the ultimate benefits to Maryland taxpayers will be much larger than those considered in Table 7.

Table 7

The Public Benefits of a School Choice Program in Maryland		
Total Public Enrollment Grades 1-12	838,955	
Cohort of Potential Graduates	58,168	
Current Annual Dropouts	26,997	
Increase in % of New Jersey Students in Private Schools	6 percentage points	
Annual Dropout Reduction	Low Impact Estimate	2,891.05
	High Impact Estimate	5,592.26
Annual Public Benefits From Increase in School Competition	Low Impact Estimate	\$4,496,536
	High Impact Estimate	\$8,697,815
Lifetime Public Benefits of 5.99 Percent Increase in Competition	Low Impact Estimate	\$269,734,750
	High Impact Estimate	\$521,757,778
Lifetime Benefits Discounted to Present Value (at 4% per Year)	Low Impact Estimate	\$101,705,690
	High Impact Estimate	\$196,733,031
Average Lifetime Public Benefit of Reducing Each Dropout		\$93,300
Average Lifetime Public Benefit of Reducing Each Dropout		\$35,180

Source: Dee (1998) and author's calculations

Conclusions

This study examined the cost of Maryland's declining high school graduation rates. The analysis considered only the most direct costs associated with lower graduation rates. It is important to understand that these cost estimates only scratch the surface. The failure to educate Maryland's children has a destabilizing effect on Maryland society, and results in numerous second-order and indirect cost effects. However, even the most visible costs described above emphasizes the need for educational reform and the fiscal cost of inaction.

Each student who fails to graduate from high school produces a direct cost on Maryland taxpayers through lower tax revenues coupled with greater social costs, such as higher Medicaid and criminal incarceration appropriations. Recognizing these costs is important to understand the benefits of introducing more competition into public education in Maryland. Research suggests that expanding school choice programs in Maryland would significantly improve public high school graduation rates in a cost-effective way. Introducing educational competition would have a profound impact on reducing the costs associated with high school dropouts.

Most importantly, school choice programs would provide meaningful choices for low-income families and would provide large public benefits equal to or greater than those realized by the students themselves.

Endnotes

- ¹ See Lake, Allison. "Education Tax Credits and the BOAST Tax Credit Proposal," Maryland Public Policy Institute, March 2007. Online at: <http://tinyurl.com/6jcmnw>.
- ² See Aud, Susan L. "Education by the Numbers: The Fiscal Effect of School Choice Programs, 1990-2006," The Friedman Foundation, April 2007.
- ³ See Podgursky, Michael; Brosky, Sarah, and Hauke, Justin P. "The Fiscal Impact of a Tuition Tax Credit Program in Missouri," The Show-Me Institute, January 2008.
- ⁴ See Education Week at the EPERC. Online at: <http://tinyurl.com/6q3nl3>.
- ⁵ See Swanson, Christopher B. "Cities in Crisis: A Special Analytic Report on High School Graduation," EPE Research Center, April 2008. Online at: <http://tinyurl.com/23ttck>.
- ⁶ See de Vise, Daniel. "New Figures Show High Dropout Rate," *Washington Post*, May 10, 2007. Online at: <http://tinyurl.com/347c4u>.
- ⁷ U.S. Census Bureau, Current Population Survey, March 2007 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 General Educational Development diploma and those who graduate from high school with a diploma. Research suggests that the labor market outcomes of a GED student are more similar to those of a dropout than a high school graduate, so the distinction is important. Since the CPS counts GED diploma recipients as high school graduates, its data will underreport the true public costs of Maryland's high school dropouts.
- ⁸ Note that 2004-2005 was the most recent academic year in which all sources were comparable. The NCES and Urban Institute figures, however, are estimates derived from 2002-2003 academic year data, although the findings were published in 2006.
- ⁹ The Maryland Department of Education indicates that 3.54 percent of students in Maryland public schools drop out in any given year, suggesting a high school graduation dropout rate of approximately 85 percent. For further details, see the Maryland Department of Education School Fact Book, 2006-2007.
- ¹⁰ The cumulative promotion index method for calculating graduation rates 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.
- ¹¹ Throughout this paper unless otherwise noted, I constrain the Maryland population sample size to reflect working age adults (i.e., ages 20-64). Analyzing the full state population would bias interpretation, since retired and younger Americans are not in the workforce and would present the illusion of lower labor force participation rates (among other consequences).
- ¹² Unemployment rates differ in Figure 5 from those reported in Figure 4 because Figure 4 reported aggregate unemployment rates, i.e. the aggregate unemployment rate for all individuals with the reported level of educational achievement or higher. The state unemployment rate is for working-age adults (i.e., age 20-64).
- ¹³ I use the average annual returns of the S&P 500 and the iShares Lehman Aggregate Bond Index from 1950-2007 and 2001-2007, respectively, as a proxy for the respective stock/bond indices. Both indices are widely accepted as benchmark standards for their respective asset classes.
- ¹⁴ A Monte Carlo simulation is a statistical test that simulates thousands of potential asset returns, based on historical moments (i.e., the mean and volatility of the returns), in order to construct a distribution of potential portfolio outcomes.
- ¹⁵ Note that in this analysis I have aggregated all taxpayers with dependent children together into one group. The greater the number of children a taxpayer has, the higher the per-child tax exemptions. But for the income range considered, the difference between one or more children would have a negligible impact on the individual's state income tax liability and therefore is immaterial.
- ¹⁶ See Brookings Institution, "Don't Buy the Sales Tax," Feb. 4, 1998, online at: http://www.brookings.edu/papers/1998/03taxes_gale.aspx.
- ¹⁷ Office of the Comptroller of Maryland, General Sales and Use Tax Levy.
- ¹⁸ Details of the Maryland budget can be found online at: <http://tinyurl.com/5d862g>.
- ¹⁹ See the Maryland Department of Health and Mental Health Fact Sheet, online at: <http://tinyurl.com/5sk53l>.
- ²⁰ See 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. Here (and throughout this paper) I am indebted to Brian J. Gottlob of PoEcon Research for his knowledge of and direction in using CPS data for economic analysis.
- ²¹ Details of Maryland incarceration and budget costs can be found online at http://mlis.state.md.us/2008rs/fnotes/bil_0003/hb0073.pdf and <http://www.dpscs.state.md.us/aboutdpscs/statistics.shtml>.
- ²² Maryland Department of Public Safety and Correctional Services Offender Characteristics, 2007. Online at: <http://tinyurl.com/55oyrk>.
- ²³ 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.
- ²⁴ The Maryland Department of Public Safety and Correctional Services provide in-depth details on the breakdown of criminal sentences by five-year increments in its 2000 annual report. I extrapolate from that report to construct a weighted-average criminal sentence of 16.4 years. (Details of the report are available online at: <http://tinyurl.com/5rqjod>.) In addition, the Maryland State Commission on Criminal Sentencing Policy found that the average Maryland inmate serves only 46 percent of his initial sentence before being released on parole or another form of community rehabilitation. Details of the report can be found online at: <http://tinyurl.com/6lejg6>.
- ²⁵ See Gottlob, Brian J. "The High Cost of South Carolina's Low Graduation Rate," The Friedman Foundation, June 2007. The probability that a released prisoner will return to prison within five years is closer to 40 percent, but as the above-referenced study notes, a higher percentage of inmates have more than one subsequent incarceration and longer sentences. Therefore, a single recidivism cost of 0.6 appears to be more appropriate.
- ²⁶ Note that the most recent EPERC graduation rates are for the 2005 academic year, and therefore there is a discrepancy between actual graduation rates and academic year. However, graduation rates vary little from year to year, so the effect of this discrepancy should be small.
- ²⁷ This may not be an exact 1:1 relationship but the true ratio should have little impact on the ultimate incarceration cost estimates.
- ²⁸ This present value calculation assumes that all high school dropouts will retire at age 65. I used a discount rate of 4 percent, equal to the approximate yield of the current 10-year Treasury note, a common benchmark.
- ²⁹ This section borrows heavily from Gottlob, Brian J. "The High Cost of South Carolina's Low Graduation Rate," The Friedman Foundation, June 2007.
- ³⁰ Hoxby, C. "School Choice and Competition: Evidence from the United States," *Swedish Economic Policy Review*, 10 (2003).
- ³¹ Dee, T. "Competition and Quality of Public Schools," *Economics of Education Review*, 17 (1998), pp. 419-427.
- ³² All data and figures from this paragraph were obtained from the U.S. Census, as compiled and reported by the Maryland Department of Business and Economic Development. Online at: www.choosemaryland.org.
- ³³ Brian J. Gottlob of PoEcon Research has conducted extensive research on the impact of state graduation rates in the following states: Missouri, Indiana, New Hampshire, North Carolina, South Carolina, New Jersey and Texas.
- ³⁴ See Podgursky, Michael; Brosky, Sarah, and Hauke, Justin P. "The Fiscal Impact of a Tuition Tax Credit Program in Missouri," The Show-Me Institute, January 2008.

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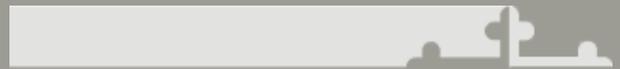
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