

# The Tax and Transfer Fiscal Impacts of Dropping Out of High School in Pennsylvania

Prepared for:  
Pennsylvania Department of Labor

Prepared by:  
Neeta P. Fogg  
Paul E. Harrington  
Ishwar Khatiwada

Center for Labor Market Studies  
Northeastern University

September 2008

## TABLE OF CONTENTS

Executive Summary .....	i
Introduction.....	1
Employment, Earnings, and Lifetime Earnings of Pennsylvania Residents.....	8
Home Ownership Rate and Value of Owner-Occupied Homes in Pennsylvania.....	13
Data Sources and Methodology Underlying the Fiscal Impact Estimates in Pennsylvania .....	15
Methodology and Calculations Underlying the Estimates of the Net Fiscal Contribution of Pennsylvania and U.S. Adults .....	18
Incidence of Tax Payments of Pennsylvania Adults by Educational Attainment .....	22
Annual Tax Payments of Pennsylvania Adults by Educational Attainment.....	26
The Receipt of Cash and Non-Cash Government Transfer Payments Among Pennsylvania Adults by Educational Attainment .....	30
The Incidence and Costs of Institutionalization in Pennsylvania .....	34
The Mean Net Fiscal Contributions of Adults by Educational Attainment.....	38
The Mean Lifetime Net Fiscal Contributions of Adults by Educational Attainment .....	41
<hr/>	
Appendix A: Estimating the Annual Federal and State Income Taxes Paid by Husbands and Wives in Married Couple Families .....	44
Appendix B: Estimating Median and Mean Values of Homes and Annual Property Taxes Paid by Pennsylvania Householders .....	46
Appendix C: Estimating State Sales Tax Payments for Individuals.....	48
Appendix E: Estimating Jail/Prison Cost of Adults (18-60).....	52
Appendix F: The Mean Lifetime Net Fiscal Contributions Adults by Educational Attainment.....	53

## Executive Summary

A high school diploma has increasingly become a prerequisite to full participation in the mainstream economy. Accesses to year-round, full-time jobs, even at low hourly rates of pay are quite limited for high school dropouts living in the state of Pennsylvania. Individuals who fail to graduate from high school have become increasingly relegated to the fringes of the labor market, stuck in extended periods of joblessness and, when working, more likely employed in part-time, part-year, low skill jobs.

Dropping out of high school imposes very high costs on the individual who drops out of school mainly through poor labor market outcomes but also from restricted access to higher education and training and a weaker voice in the political and electoral system. The weak labor market outcomes of high school dropouts result in reduced annual earnings, low income levels, a sharply higher risk of poverty, and all the negative personal and family consequences associated with life at the margins of the labor market. However, the costs of dropping out are not borne exclusively by the dropout. Many of the costs of dropping of high school spill over to local communities, the Commonwealth of Pennsylvania and the nation a whole.

There are a variety of non-monetary as well as monetary costs that decision to drop out of high school imposes upon the broader community. One of the primary sources of direct monetary costs that high school dropouts impose on the community are in the form of lower tax payments. A second major source of costs imposed by dropouts on the community is more intensive reliance on both cash and non-cash government income transfers. Another cost that is imposed by high school dropouts on the economy is the cost of incarceration. High school dropouts in Pennsylvania have much higher probabilities of incarceration at a point in time than those with more schooling.

The grim fiscal consequences of dropping out of high school are exacerbated in an economy that continues to create jobs that require high levels of skills and literacy proficiencies. Employment opportunities for unskilled persons have declined sharply as the industry structure of employment has shifted from manufacturing to service industries and as the production of the nation's output has become more technologically

sophisticated raising the literacy and educational requirements of the workforce. Although employment opportunities for high school dropouts do exist at the lower end of the labor market, an increase in the labor supply of low skilled workers from undocumented immigration and increased globalization and outsourcing of low-skill jobs have exerted a downward pressure on both dropout employment rates and wages. All of these trends have increased the cost of dropping out of high school to the individual high school dropout, the economy, and society at large.

### **Employment and Earnings**

- Only 52 percent of high school dropouts in Pennsylvania were employed during the 2006 calendar year compared to nearly 72 percent of the state's high school graduates, 84 percent of those with a bachelor's degree, and 86 percent of those with a master's or a higher academic degree.
- The mean annual earnings of 18- to 64-year old high school dropouts in Pennsylvania were \$14,600 or less than half of the mean annual earnings of all adults in Pennsylvania, \$33,600. The mean earnings of high school graduates in the state were \$23,800 representing an earnings premium compared to high school dropouts, of \$9,100 or 63 percent. The earnings of college-educated Pennsylvanians ranged from \$31,000 among those who had completed some college below the bachelor's degree level, to \$48,400 among those with a bachelor's degree, and \$73,800 among those who had a master's or a higher degree. These earnings levels were, respectively, 2.1, 3.3, and 5.1 times higher than the mean annual earnings of high school dropouts in the state.
- These sharp differences between the annual earnings of high school dropouts and well-educated adult residents of Pennsylvania are expected to result in large difference in their annual tax payments for payroll taxes, federal and state personal income taxes and sales taxes.
- Over their entire working lifetime, high school dropouts in Pennsylvania are expected to earn \$660,400 and high school graduates, \$1.04 million. Pennsylvanians who complete some college education below a bachelor's degree can expect to earn \$1.31 million or twice as much as high school dropouts,

whereas those with a bachelor's degree and those with a master's or a higher degree are expected to respectively earn 3 and 4 times as much as high school dropouts over their working lifetimes.

### **Home Ownership and value of Owner-Occupied Homes**

- The amount of property taxes paid by individuals depends on their home ownership rates and the market value of their homes. The rate of home ownership and the value of owner-occupied homes also increased sharply with educational attainment in Pennsylvania.
- Nearly 70 percent of all 18- to 64-year old householders in Pennsylvania owned their homes. The rate of home ownership varied from just 52 percent among high school dropouts, to 68 percent among high school graduates and those householders with some college education below the bachelor's degree level, to 77 percent among householders with a bachelor's degree, to nearly 81 percent among those with a post-graduate education (master's or higher degree).
- The mean value of owner-occupied homes increased steadily with education of the householder. In 2006, the mean value of an owner-occupied home in Pennsylvania was \$201,500 and the range of the values of these homes by the education of the householder varied from a low of \$134,400 among high school dropouts to a high of \$313,800 among owner-householders with a master's or a higher degree.

### **Annual Tax Payments**

- Not only were better-educated Pennsylvanians more likely to pay the federal, state, and local taxes but they also paid much higher amounts of these taxes over the year.
- High school dropouts in Pennsylvania made a combined tax payment (including federal and state income taxes, social security payroll taxes, federal government retirement contributions, local property taxes, and state sales taxes) of just \$7,106, which represents a little more than half of the mean combined tax payment of all Pennsylvania adults (\$13,713). The mean combined tax payment among high

school graduates was \$10,100 or 42 percent higher than the amount paid by high school dropouts. Pennsylvanians with a bachelor's degree paid an average of \$18,100 in tax payments and those with a master's or higher degree paid an average of \$29,500.

- On average for every \$1 in taxes paid by a high school dropout in Pennsylvania, high school graduates paid \$1.42, bachelor's degree holders paid \$2.55, and post-graduate degree holders paid \$4.15.

### **Cash Transfers**

- Income is a recurring and important component of most eligibility criteria for government transfer payments to the non elderly population of the state. Given the lower levels of employment and earnings and incomes among the poorly-educated compared to their better-educated counterparts, poorly educated individuals would be more likely to be eligible for, and therefore more likely to receive, government transfers.
- The proportion of working age Pennsylvanian adults who received government transfers was highest among high school dropouts and declined sharply among better-educated groups.
- Nearly four out of ten Pennsylvania dropouts received one or more cash transfer payments, compared to 27 percent among high school graduates, 22 percent among adults with some college education below the bachelor's degree level, 10 percent among college graduates with a bachelor's degree, and 8.6 percent among those with a master's or a higher college degree.
- High school dropouts in the state were 4.6 times more likely than their counterparts with a post-graduate degree, nearly 4 times as likely as those with a bachelor's degree, and 1.5 times more likely than high school graduates (without any postsecondary education) to collect one or more cash government transfer payment.

## **Non Cash Transfers**

- Nearly 14 percent of all adult Pennsylvanians had reported receiving one or more in-kind transfers such as Medicaid or Medicaid benefits, food stamps, energy assistance, housing subsidies, or school lunch subsidies.
- The rate of receipt of non cash transfers among the non elderly population varies sharply by level of educational attainment. Among Pennsylvania's adult high school dropouts, 35 percent received a non cash transfer benefit—representing more than twice the rate of receipt among high school graduates without any college education (17 percent). Only about 11 percent of those with some college education below the bachelor's degree level, just 4 percent of those with a bachelor's degree, and only 2 percent among the best-educated Pennsylvanians (with a master's or higher degree) received some type of in-kind benefit transfer.
- High school dropouts in the state were nearly 15 times more likely than college graduates with a master's or higher degree, nearly 9 times more likely than college graduates with a bachelor's degree, and twice as likely as high school graduates to collect non-cash transfers at any time during the year over the 2004-2006 period.

## **The Incidence and Costs of Institutionalization**

- The incidence and costs of institutionalization of adults in Pennsylvania declined sharply with increases in educational attainment. While 1.3 percent of all 18- to 60-year Pennsylvanians was institutionalized in 2006, the rates of institutionalization varied from a high of over 5 percent among high school dropouts, to 1.6 percent among those with just a high school diploma or a GED, to 0.2 percent and 0.1 percent, respectively, among college educated adults with a bachelor's degree and with a master's or a higher degree.
- The high rate of institutionalization among high school dropouts resulted in a very high annual average cost of institutionalization per adult high school dropout in Pennsylvania (\$1,867). The annual institutionalization cost among adult high school graduates, with no college education, was much lower (\$575). Among

college educated adults residents of Pennsylvania, the average annual cost of institutionalization per person was \$232 among adults with a below bachelor's degree level college education, \$66 per year among college graduates with a bachelor's degree, and only \$40 among college graduates with a master's or higher academic degree.

### **The Mean Net Fiscal Contributions**

- The difference between the mean annual tax payments and the mean values of annual cash and in-kind transfers and per capita annual costs of institutionalization of Pennsylvania adults represent their mean annual net fiscal contributions.
- The net fiscal contribution of the average working age adult without a high school diploma in Pennsylvania was negative (-\$683) indicating that mean annual tax payments were \$683 lower than the sum of the mean value of annual transfers and the annual institutionalization costs.
- Adults in the remaining 4 educational groups had positive net fiscal contributions albeit of varying magnitudes. Adults with only a high school education and no postsecondary education annually contributed \$6,067 more in tax payments than the sum of what was received in the form of transfers and the costs that they imposed for institutionalization. The net fiscal contribution of adults with below bachelor's level college education was \$9,485 per year. College graduates with a bachelor's degree or a master's or higher degree made net fiscal contributions of \$16,962 and \$28,183, respectively.
- The ratio of mean annual tax payments to the annual mean value of transfers and annual institutionalization costs rose sharply with education in Pennsylvania—from 0.91 among adults who did not complete high school, to 15.59 among adults with a bachelor's degree, and 22.10 among adults with a master's or a higher academic degree. A high school dropout paid only \$0.91 for every \$1 received in the form of transfers and institutionalization costs whereas a high school graduate without any further education contributed \$2.50 in taxes for every \$1 of transfers and institutionalization costs. Those with a bachelor's degree contributed nearly

16 times more in tax payments than received in transfers and institutionalization costs while their counterparts with a master's or a higher degree put in \$22 for every \$1 received for transfers and institutionalization costs.

- Over their working lives, the negative annual net fiscal contribution of adults who failed to complete high school would cumulate into (-) \$32,000. In contrast, a high school graduate (without any college education) is estimated to make a net fiscal contribution of (+) \$273,000. The mean lifetime net fiscal contributions of adults with some college, with a bachelor's degree, and with a master's or a higher academic degree are estimated, respectively, at (+) \$408,000, (+) \$695,000, and (+) \$1.071 million.
- Each high school dropout in Pennsylvania is estimated to impose a lifetime cost (negative net fiscal impact) of (-) \$32,000. Each high school graduate (without any college education) is expected to make a net positive fiscal contribution of (+) \$273,000 over their working lives. The sum of the two (a saving of \$32,000 plus an additional contribution of \$273,000 or \$305,000 represents the potential gain to the federal, state, and local governments for each successful graduation from a Pennsylvania high school of a student who would have otherwise dropped out of high school.

Clearly, working age adults who fail to complete high school impose very high costs upon the public coffers in the form of low tax payments, high rates and amounts of receipt of government transfer payments along with high institutionalization costs. These fiscal losses to taxpayers are in addition to the sizable personal costs of dropping of high school that are borne by the individuals themselves. The large gap between the lifetime net fiscal contributions of high school dropouts and their counterparts with just a high school education indicate that the monetary benefit of each successful high school graduation to the public coffers is indeed very large. Although the components in the net fiscal contributions estimated in this report encompass a wide array of taxes and transfers and costs, these estimates are still very conservative since they do not include non-quantifiable personal costs, health costs, and social costs of high school dropouts and the

transmission of these costs to future generations through diminished resources available to their children.

## Introduction

A high school diploma has increasingly become a prerequisite to full participation in the mainstream economy. Accesses to year-round, full-time jobs, even at low hourly rates of pay are quite limited for high school dropouts. Individuals who fail to graduate from high school have become increasingly relegated to the fringes of the labor market, stuck in extended periods of joblessness and, when working, more likely employed in part-time, part-year, low skill jobs. A high school diploma has become the minimum educational requirement for Pennsylvania residents that can provide access to employment and earning experiences over their working lives capable of generating sufficient income to achieve a middle class standard of living.<sup>1</sup>

While high school dropouts are increasingly relegated to the margins of the Pennsylvania labor market, they also are largely shut out of the economic gains associated with access to post secondary education at the two and four year college degree level as well as in non degree post secondary educational programs. Admission to a higher education program requires the completion of high school. Even when admission is not contingent upon earning a high school diploma, dropouts are less likely to enroll in a post secondary program. High school dropouts are therefore also shut out of most education and training opportunities. The degree of civic engagement of individuals is also found to be highly correlated with their level of educational attainment. Unsurprisingly, civic engagement is another arena with very limited participation by high school dropouts. Compared to better educated individuals including high school graduates, high school dropouts are considerably less likely to participate in the labor market, are not eligible (and are unlikely) to enroll in most postsecondary education programs and a number of training programs, and are not as active in the civic or the electoral arena.

---

<sup>1</sup> This was not always the case. As late as the end of the 1970s, men who had dropped out of high schools had expected life time earnings that could provide their families with decent living standard. See: Neeta P. Fogg, Paul E. Harrington and Ishwar Khatiwada, *The Long Term Labor Market Consequences of Dropping Out of High School In Pennsylvania*, Prepared for the Pennsylvania Department of Education, Harrisburg, October, 2007 and Neeta P. Fogg, Paul E. Harrington and Ishwar Khatiwada *The Lifetime Employment and Earnings Consequences of Dropping Out of High School in Philadelphia*, prepared for the Philadelphia Workforce Investment Board, Philadelphia, February, 2008

Evidence on the poor labor market participation and inferior labor market outcomes among high school dropouts abounds.<sup>2</sup> Individuals who fail to complete high school are less likely to participate in the labor market and to look for a job. When they do look for employment, the lack of a high school diploma poses a major barrier to finding work. Consequently, the unemployment rate of high school dropouts is considerably higher than that of their better-educated counterparts. During 2007, the annual average unemployment rate of high school dropouts across the nation was 10.6 percent compared to 5.6 percent among high school graduates, and only 2.2 percent among college graduates. Even when dropouts do find a job, they typically work considerably fewer hours per year and have sharply lower hourly wages; the combination of both of these factors sharply depresses their annual earnings compared to those with more schooling. High school dropouts are also much less likely to receive employment-related benefits such as health insurance and employer sponsored retirement programs compared to better-educated individuals. Although possessing just a high school diploma does not guarantee the best labor market outcomes, completing high school sharply increases access to higher quality labor market opportunities that are now largely unavailable to those without a high school diploma.

In the education arena, access to postsecondary education and many training programs is typically denied to those who do not have this basic credential. Civic engagement in the form of volunteering activities, active group or association membership, fundraising and charity activities, regular voting in elections, and volunteering for political campaigns is much less likely among high school dropouts.<sup>3</sup>

---

<sup>2</sup> For a review of the relationship between educational attainment, changing skills requirements and labor market outcomes in Pennsylvania and Philadelphia, see: Paul Harrington, Neeta Fogg, and Kevin McCabe, *The Educational Deficit in Philadelphia*, Prepared for the Philadelphia Workforce Investment Board, December 2005; See also Philadelphia Workforce Investment Board, *A Tale of Two Cities*, PWIB, 2006: For a review of the relationship between educational attainment, literacy proficiencies, and labor market outcomes in the nation, see: (i) Andrew Sum, Irwin Kirsh, and Kentaro Yamamoto, *Pathways to Labor Market Success: The Literacy Proficiencies of U.S. Adults*, Education Testing Service, Princeton, New Jersey, 2004; (ii) Irwin Kirsh, Henry Braun, Andrew Sum, and Kentaro Yamamoto, *The Perfect Storm: Three Forces Changing Our Nation's Future*, Education Testing Service, Princeton, New Jersey, 2007; (iii) Paul Barton, *One-third of a Nation: Rising Dropout Rates and Declining Opportunities*, Policy Information Center, Educational Testing Service, Princeton, New Jersey, 2005.

<sup>3</sup> Scott Keeter, Cliff Zukin, Molly Andolina, and Krista Jenkins, *The Civic and Political Health of the Nation: A Generational Portrait*, The Center for Information & Research on Civic Learning & Engagement, Tufts University, Medford, Massachusetts, September 2002.

Moreover, civic engagement has declined over time with the largest declines occurring among high school dropouts.<sup>4</sup> An apt description of this phenomenon was provided by John Bridgeland, a former domestic advisor to President Bush, who said that “High school dropouts are ... nearly voiceless in a system that fails them.”<sup>5</sup>

There is no doubt that dropping out of high school imposes very high costs on the individual who drops out of school mainly through poor labor market outcomes but also from restricted access to higher education and training and a weaker voice in the political and electoral system. The weak labor market outcomes of high school dropouts result in low level of earnings, low income levels, a higher risk of poverty, and all the negative personal and family consequences associated with poverty and economic disadvantage. However, the costs of dropping out are not borne exclusively by the dropout. Many of the costs of dropping of high school spill over to local communities, the Commonwealth of Pennsylvania and the nation a whole.

There are a variety of non-monetary as well as monetary costs that the decision to drop out of high school imposes upon the broader community. One of the primary sources of direct monetary costs that high school dropouts impose on the community are in the form of lower tax payments. Most taxes are levied on income, consumption and wealth, all of which are heavily dependent on an individual’s ability to generate earned income over their working lives. A second major source of costs imposed by dropouts on the community is more intensive reliance on both cash and non-cash government income transfers. As we shall see, the impact of dropping out on federal, state, and local government revenues and expenditures is quite considerable and the costs of these revenue deficits and increased expenditures that are associated with dropping out of high school are borne by those who have achieved higher levels of educational attainment.

The incomes of high school dropouts are depressed because they are less likely to be employed and when they do find employment they gain access to lower-quality jobs

---

<sup>4</sup> *Broken Engagement: America's Civic Health Index*, National Conference on Citizenship, Washington, D.C., September 2006; *Renewed Engagement: Building on America's Civic Core*, National Conference on Citizenship, Washington, D.C., September 2007; Robert Putnam, *Bowling Alone: The Collapse and Revival of American Community*, Simon and Schuster, New York, New York, 2000.

<sup>5</sup> Amy Goldstein, “Civic Involvement Tied to Education,” *The Washington Post*, September 19, 2006, p. A19.

that pay lower wages and provide fewer benefits; and this has important implications for tax revenues at the federal, state and local level. High school dropouts have lower rates of participation in the labor force, lower employment rates, work fewer hours per week and fewer weeks during the year, and thus have much lower annual and lifetime earnings than those who have higher levels of education including college graduates as well as high school graduates. Low earned income among dropouts in Pennsylvania translates into reduced tax payments and higher transfer costs.

Most taxes are closely associated with the income and earnings of individuals. Tax payments generally increase with income. In the case of income taxes this connection is especially strong. Since income taxes are based upon income levels and high school dropouts have lower earnings and incomes, they are likely to make much smaller contributions to the public coffers in the form of income taxes. The social security payroll tax is also tied to earnings as it is imposed as a fixed percent of earnings. The more marginal employment and earnings experiences of high school dropouts means that at a given point in their working lives they either pay no social security payroll tax or pay much smaller amounts of this tax compared to those with more schooling.

Because of their lower earnings and incomes, high school dropouts also have a lower purchasing power and therefore pay smaller amounts of sales taxes than better-educated individuals who have higher earnings and incomes and a higher purchasing power. High school dropouts are also much less likely to own their home and when they do own their home, they are more likely to own a lower-price home that is within their limited means. Since real estate (home) property tax payments are proportionate to the assessed value of the home, high school dropouts are likely to pay either no property tax since many do not own their homes or they are likely to pay smaller amounts of property taxes since many own lower price homes. Thus, high school dropouts contribute less than better-educated individuals to the revenues of the federal, state, and local governments.

As noted earlier, high school dropouts are much more dependent on public assistance income transfer programs than their better-educated counterparts. They are more likely to receive transfer payments than others and the amount of cash and non-cash transfer payments are higher among high school dropouts than among their better-

educated counterparts. The reason underlying the higher reliance on public assistance among high school dropouts is their poorer labor market outcomes—lower rates of labor force participation, lower employment rates, and fewer annual hours of employment, and lower wages—that result in lower earnings and incomes among them. Eligibility for cash and non-cash transfers for the non elderly (those under the age of 65) is largely based upon household income levels. The low earnings and incomes of high school dropouts sharply increase their likelihood of eligibility for transfer payments. The receipt of cash and non-cash transfer income is therefore much higher among high school dropouts.

Another cost that is imposed by high school dropouts on the economy is the cost of incarceration. Many high school dropouts operate on the fringes of the legitimate labor market. Involvement in illegal activities is much higher among high school dropouts than among those who have completed high school but rates of illegal activity decreases sharply among those with postsecondary education and college degrees. A higher involvement in illegitimate activities among high school dropouts leads to a higher rate of incarceration among them. In fact, a large majority of the nation’s inmates lack a high school diploma. According to the Bureau of Justice Statistics in 1997, 41 percent of the nation’s inmates in federal and state prisons and local jails did not have a high school diploma and another 24 percent had obtained only a GED. Thus, nearly two-thirds of the nation’s inmates did not earn a regular high school diploma. As a comparison, only 18 percent of the general population (age 18 or older) lacked a regular high school diploma associated with the successful completion of four years of high school.<sup>6</sup>

Some economists argue that the high rate of involvement of high school dropouts in illegitimate activities is associated with a lack of opportunities in the mainstream or legitimate economy. The lack of opportunities in the mainstream economy among high school dropouts reduces their opportunity cost (lost wages) of incarceration, which is one of the consequences of participation in illegitimate activities.<sup>7</sup> If their perceived earnings

---

<sup>6</sup> Caroline Wolf Harlow, *Education and Correctional Populations*, Bureau of Justice Statistics, Special Report, January 2003, NCJ 195670.

<sup>7</sup> Lance Lochner and Enrico Moretti, “The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self Reports,” *The American Economic Review*, March 2004, pp. 155-189.

from the illegitimate activities are higher than their earnings in legitimate jobs, high school dropouts will be more likely to pursue illegitimate activities.<sup>8</sup>

The grim consequences of dropping out of high school are exacerbated in an economy that continues to create jobs that require high levels of skills and literacy proficiencies. Employment opportunities for unskilled persons have declined sharply as the industry structure of employment has shifted from manufacturing to service industries and as the production of the nation's output has become more technologically sophisticated raising the literacy and educational requirements of the workforce. Although employment opportunities for high school dropouts do exist at the lower end of the labor market, an increase in the labor supply of low skilled workers from undocumented immigration and increased globalization and outsourcing of low-skill jobs have exerted a downward pressure on wages at the lower end of the labor market and limited the access to employment of high school dropouts even in the low-skill sector of the labor market. All of these trends have increased the cost of dropping out of high school to the individual high school dropout, the economy, and society at large.

This research report describes and estimates some of the most important financial impacts on federal, state and local government revenue and expenditures of high school dropout residents relative to Pennsylvania residents with more schooling. It examines the financial consequences to government of dropping out in Pennsylvania and places these impacts in the context of the nation a whole. The paper provides an estimate of the net lifetime fiscal impact of dropping out for each of five distinct educational groups in the Commonwealth. The net fiscal impact is measured as the difference between quantifiable revenues in the form of taxes paid and the total quantifiable costs or expenditures in the form of cash and non-cash transfers and incarceration costs of each adult resident of the state.

The report begins with an analysis of the labor market outcomes of employment, earnings, and lifetime earnings, of the working-age adult (18-64) residents of

---

<sup>8</sup> Richard Freeman, "Why Do So Many Young American Men Commit Crimes and What Might We Do About It," *Journal of Economic Perspectives*, Winter 1996, pp 25-62.

Pennsylvania by their educational attainment.<sup>9</sup> The income of adult residents in the state, which is the primary determinant of their tax payments and their dependency on income transfers, is largely determined by their labor market outcomes. A large majority of income for most people is derived from earnings in the labor market. Analysis of the 2006 ACS data by the authors indicates that among all working age individuals, earnings comprise 72 percent of total personal income in the Commonwealth. If the elderly population (65 years or older) is excluded, earnings account for 86 percent of personal income. Thus, the level of income for most individuals is closely related to the level of their earnings in the labor market.

Also presented in this section are home ownership rates and the values of owner-occupied homes among Pennsylvania residents in each of the five educational groups. The ability to accumulate wealth, most often held as a form of property, is heavily dependent on an individual's lifetime stream of earnings. The lower earnings and incomes of high school dropouts result in lower home ownership rates among them. Further, when they do own their homes, high school dropouts are likely to own lower-priced homes. Home ownership rates and the market values of owner-occupied homes determine the amount of property tax payment by households. Lower home ownership rates combined with ownership of lower priced homes among high school dropout households translate into lower property tax payments among high school dropouts compared to better-educated individuals.

Following our discussion of home ownership the report describes and presents estimates of each of the components of quantifiable revenues—tax payments— from households, that are included in computing the net fiscal impact for each educational group. Estimates are presented for federal income tax payments, social security retirement payroll taxes, federal government retirement contributions, state income tax payments, state sales tax payments, and the property tax liability. Estimates of these tax payments are presented for each of the following five educational subgroups of adults (18-64) in Pennsylvania:

---

<sup>9</sup> A more detailed review of these findings can be found in op.cit, *The Long Term Labor Market Consequences...*

- Less than 12 or 12 years of school, no high school diploma or GED certificate.<sup>10</sup>
- High school diploma or GED, no completed years of post-secondary schooling
- One to three years of college, including Associate degree holders
- Bachelor degree holders, no advanced degree
- Master's or higher degree holders

The sum of these tax payments represents the total tax payments made by individuals in each educational group.

The next section of the report contains descriptions and estimates of each of the components of quantifiable costs—cash and non-cash transfer payments and incarceration costs—used in our computation of net fiscal impacts. Dollar values of nine cash transfer payments and estimated market values of six non-cash or in-kind transfers for adult (18-64) Pennsylvanians by their level of educational attainment are presented in this section. Another component of the quantifiable costs used in our computation of net fiscal impacts is the cost of incarceration. For each educational subgroup of the adult (18-60) population of Pennsylvania, we have presented the average annual cost of institutionalization per adult resident.

The final section contains estimates of the net fiscal impacts associated with each educational subgroup of adult residents of Pennsylvania. Annual average estimates of the net fiscal impacts associated with each educational subgroup of Pennsylvania residents are presented in this section. We also extrapolate these mean annual estimates over the working lifetimes of each educational subgroup of residents to obtain estimates of the expected lifetime fiscal impacts of achieving a given level of educational attainment in Pennsylvania.

## **Employment, Earnings, and Lifetime Earnings of Pennsylvania Residents**

The employment and earnings experiences of adults are key determinants of their fiscal contributions to the federal and state government budgets in the form of tax

---

<sup>10</sup> High school students and college students under the age of 25 are excluded from the analysis. The monthly CPS survey collects data on the school enrollment status of persons 16-24 years of age.

payments. The federal personal income tax is a progressive tax whereby adults with higher personal incomes not only pay higher federal income tax payments but also pay a higher share of their personal income in federal income taxes. Since the Pennsylvania state personal income tax is proportional and not progressive, the state income tax liability still rises proportionately with income levels.<sup>11</sup> The social security payroll tax is also a proportional tax of 6.2 percent up to a maximum income threshold that is increased each year based on the rate of inflation. The upper income limit for social security payroll tax was \$97,500 in 2007 and 102,000 in 2008.<sup>12</sup> The state sales tax payments also increase with income since increased incomes are associated with increase in expenditures on goods and services many of which are subject to the sales tax.

The employment rates of 18- to 64-year old adults varied widely by educational attainment in Pennsylvania as well as the nation. Only 52 percent of high school dropouts in Pennsylvania were employed during the 2006 calendar year. Completing high school increased the probability of employment among Pennsylvania residents by 20 percentage points. Nearly 72 percent of the state's high school graduates were employed in 2006. Postsecondary education is associated with even higher rates of employment. Adult residents of the state with some college education or an associate's degree had an employment rate of 78 percent, while 84 percent of those with a bachelor's degree and 86 percent of their counterparts with a master's or a higher academic degree were employed in 2006. Employment rates of college-educated adult residents of Pennsylvania were between 27 to 35 percentage points higher than that of the state's high school dropouts.

Although similarly large differences in the employment rate exist across educational groups in the nation, the employment rate among the nation's high school dropouts was 5 percentage points higher than that of their Pennsylvania counterparts (57 percent in the U.S. versus 52 percent in Pennsylvania). This difference means that the state's high school dropouts have somewhat fewer employment opportunities than their nationwide counterparts. Employment rates of the remaining four educational groups in

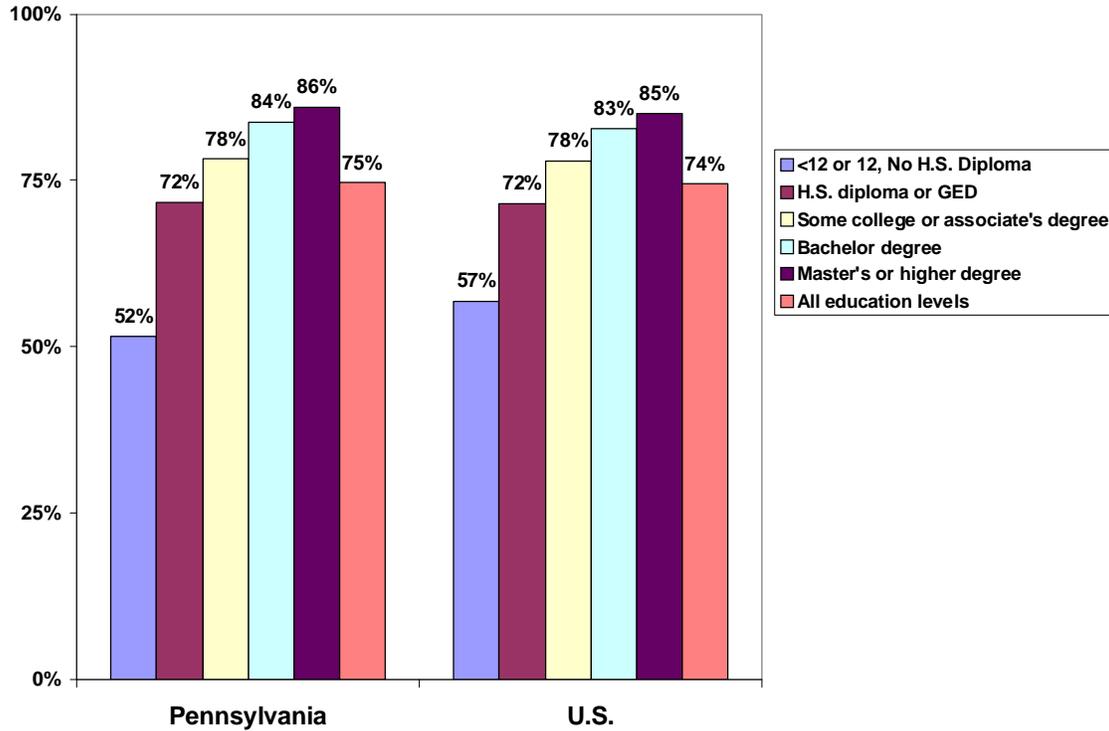
---

<sup>11</sup> Tax exemptions for low income individuals make even the proportional state income taxes mildly progressive.

<sup>12</sup> The 6.2 percent tax is paid by employee and is matched by a 6.2 percent tax payment by the employer. There is no upper income limit on Medicare taxes where the employer and employee each pay 1.45 percent on all earnings. See: Social Security Online Electronic Fact sheet. Available at: <http://www.ssa.gov/pubs/10003.html>.

the nation were quite similar to those of Pennsylvania residents in those educational groups.

Chart 1:  
Employment to Population Ratio of 18-64 Year Old Civilian Non-Institutional Population of Pennsylvania and U.S., 2006



Source: 2006 American Community Survey (ACS), Public Use Microdata Samples (PUMS) files, U.S. Census Bureau, tabulations by authors.

Wide gaps between high school dropouts and their better-educated counterparts also exist in the level of their annual earnings. The lower rates of employment of poorly educated individuals coupled with lower hourly wage rates and fewer annual hours of work among them result in considerably lower level of earnings. In the Commonwealth of Pennsylvania, the mean annual earnings of 18- to 64-year old high school dropouts stood at \$14,600; a level that was less than half of the mean annual earnings of all adults in Pennsylvania, \$33,600. Sizable gaps exist between the earnings of high school dropouts and high school graduates in Pennsylvania. The mean earnings of high school graduates in the state were \$23,800. This represents an earnings premium of \$9,100 or 63 percent among the state's high school graduates relative to high school dropouts.

Table 1:  
Mean Annual Earnings of 18- to 64-Year Old Civilian Non-Institutional Population in Pennsylvania and the U.S., 2006

Educational Attainment	Pennsylvania		U.S.	
	Mean Annual Earnings	Ratio Relative to High School Dropouts	Mean Annual Earnings	Ratio Relative to High School Dropouts
<12 or 12, No H.S. Diploma	\$14,589	1.000	\$14,787	1.000
High school graduate or GED	\$23,726	1.626	\$23,655	1.600
Some college or associate's degree	\$30,944	2.121	\$32,300	2.184
Bachelor degree	\$48,440	3.320	\$51,584	3.489
Master's or higher degree	\$73,776	5.057	\$76,102	5.147
All education levels	\$33,558	2.300	\$34,568	2.338

Note: Individuals with no earnings were assigned 0 earnings in the computation of mean annual earnings.  
Source: 2006 American Community Survey (ACS), Public Use Microdata Samples (PUMS) files, U.S. Census Bureau, tabulations by authors.

Earnings of Pennsylvania residents increased sharply with additional education after high school completion. Individuals with a postsecondary education are more likely to be employed, are paid a higher hourly wage, and work more hours during the year, and thus earn much more than those without any postsecondary education. The earnings of college-educated Pennsylvanians ranged from \$31,000 among those who had completed some college below the bachelor's degree level, to \$48,400 among those with a bachelor's degree, and \$73,800 among those who had a master's or a higher degree. These earnings levels were, respectively, 2.1, 3.3, and 5.1 times higher than the mean annual earnings of high school dropouts in the state. The earnings differentials across educational subgroups of adults in the nation were similar to those in Pennsylvania. These sharp differences between the annual earnings of high school dropouts and well-educated adult residents of Pennsylvania are expected to result in large difference in their annual tax payments for payroll taxes, federal and state personal income taxes and sales taxes.

The sharp differences in the annual earnings between educational subgroups of the population prevail over their working lifetimes. We have used the 2006 American Community Survey data to calculate lifetime earnings of 18-64 year old residents of

Pennsylvania in each of the five educational subgroups. The lifetime earnings of each group were calculated as the sum of the 2006 mean annual earnings in single age groups within each educational subgroup. The lifetime earnings differentials represented by these cross-sectional estimates are conservative since they do not account for declines in the earnings of poorly educated individuals that are likely to continue into the future as they have occurred over the past 25 to 30 years.

Over their entire working lifetime, high school dropouts in Pennsylvania are expected to earn \$660,400. The lifetime earnings of high school graduates were considerably higher, \$1.04 million or nearly 60 percent higher than that of high school dropouts. Similar to the college annual earnings premium, the lifetime earnings premium

Table 2:  
Mean Lifetime Earnings of 18- to 64-Year Old Civilian Non-Institutional Population in Pennsylvania and the U.S., 2006

Educational Attainment	Pennsylvania	Ratio	U.S.	Ratio
		Relative to High School Dropouts		Relative to High School Dropouts
<12 or 12, No H.S. Diploma	660,386	1.000	661,129	1.000
High school graduate or GED	1,037,809	1.572	1,053,854	1.594
Some college or associate's degree	1,311,313	1.986	1,367,638	2.069
Bachelor degree	2,047,449	3.100	2,161,306	3.269
Master's or higher degree	2,827,162	4.281	2,973,651	4.498
All education levels	1,432,050	2.169	1,489,139	2.252

Note: 18- to 22-year old individuals enrolled in school at the time of the ACS survey were excluded from these estimates.

Source: 2006 American Community Survey (ACS), Public Use Microdata Samples (PUMS) files, U.S. Census Bureau, tabulations by authors.

associated with a college education was sizable. Pennsylvanians who complete some college education below a bachelor's degree can expect to earn \$1.31 million representing a lifetime earnings that was twice as large as that high school dropouts. Individuals with a bachelor's degree and those with a master's or a higher degree are expected to respectively earn 3 and 4 times as much as high school dropouts over their working lifetimes. The mean lifetime earnings of adult residents of Pennsylvania were

\$2.047 million among those with a bachelor's degree and \$2.827 million among those with a post-graduate degree.

Nationwide, the lifetime earnings differences between the five educational groups were similarly wide. The mean lifetime earnings of high school dropouts was 661,100, a level that was nearly 400,000 lower than that of high school graduates, \$1.5 million lower than the lifetime earnings of those with a bachelor's degree and over \$2.3 million lower than those with a post-graduate degree. Individuals with a bachelor's degree in the nation are expected to earn 3.3 times as much as high school dropouts and those with a post-graduate degree are expected to earn 4.5 times as much as high school dropouts over their working lifetimes.

## **Home Ownership Rate and Value of Owner-Occupied Homes in Pennsylvania**

The property tax is the largest single source of revenue for most local governments. Many of the services provided by local governments, particularly elementary and secondary education, are largely financed by local real estate or property taxes. In Pennsylvania as well as other states, property tax revenues are a large component of the financing of the K-12 education system. In Pennsylvania, during the 2001-02 fiscal year the real estate property taxes accounted for nearly 80 percent of local taxes for school districts and local taxes in turn accounted for nearly 57 percent of the general fund revenue for school districts in the state.<sup>13</sup> Given the importance to state and local finance we included property tax revenue impacts as one of the revenue components in our estimates of the fiscal impacts of adults with different levels of education.

The amount of property taxes paid by individuals depends on their home ownership rates and the market value of their homes. Home ownership is closely associated with the level of income of the householder which in turn is determined largely by the employment and earnings of the householder. As noted above, the employment rate and earnings of individuals in Pennsylvania rose sharply with

---

<sup>13</sup> Sources: (i) Pennsylvania Department of Education, Selected Revenue Data and Equalized Mills For Pennsylvania School Districts, 2001-2002, [http://www.pde.state.pa.us/k12\\_finances/lib/k12\\_finances/2001-02\\_RevPubTotal.pdf](http://www.pde.state.pa.us/k12_finances/lib/k12_finances/2001-02_RevPubTotal.pdf); (ii) Scorecard data for Education Finance, Local School Tax Sources, Fiscal Year 2001-02, <http://www.issuespa.net/scorecards/382/476?curCategory=173>

educational attainment. Unsurprisingly our analysis has found that the rate of home ownership in the state also increased sharply with educational attainment. While nearly 70 percent of all 18- to 64-year old householders in Pennsylvania owned their homes, the rate of home ownership varied from just 52 percent among high school dropouts, to 68 percent among high school graduates and those householders with some college education below the bachelor’s degree level, to 77 percent among householders

Table 3:  
Home Ownership Rates and the Mean Value of Owner-Occupied Homes of 18- to 64-  
Year Old Householders in Pennsylvania by Educational Attainment, 2006

Educational Attainment	Home Ownership Rate	Mean Value of Owner- Occupied Home
<12 or 12, No H.S. diploma	51.7	\$134,353
H.S. diploma/GED	68.1	\$148,404
Some college or associate’s degree	68.2	\$184,571
Bachelor’s degree	77.2	\$260,136
Master's or higher degree	80.7	\$313,786
All education levels	69.9	\$201,476

Source: 2006 American Community Survey Public Use Microdata Samples (PUMS) Data Files. Tabulations by authors.

with a bachelor’s degree, to nearly 81 percent among those with a post-graduate education (master’s or higher degree). Home ownership gaps were significantly large between poorly educated and better educated Pennsylvanians. Compared to high school dropouts, the likelihood of owning a home was about one third greater among high school graduates, nearly 50 percent more likely among householders with a bachelor’s degree, and 56 percent more likely among the best-educated householders—those with a master’s or a higher degree.

The property tax revenues of local governments are determined by the value of the property that is owned by residents of the locality. Our analysis found of the ACS data files found that the value of owned homes varied widely by the educational attainment of the householder. In 2006, the mean value of an owner-occupied home in Pennsylvania was \$201,500 and the range of the values of these homes by the education

of the householder varied from a low of \$134,400 among high school dropouts to a high of \$313,800 among owner-householders with a master's or a higher degree. The mean value of owner-occupied homes increased steadily with education of the householder. The homes owned by high school graduates had an 11 percent higher market value compared to those owned by high school dropouts. Postsecondary education was associated with even higher home values. The values of homes owned by householders with postsecondary education below, at, or above the bachelor's degree level were, respectively, 37 percent, 94 percent, and 234 percent higher than the values of homes owned by householders who had failed to complete high school.

## **Data Sources and Methodology Underlying the Fiscal Impact Estimates in Pennsylvania**

The analyses of the fiscal consequences of dropping out of high school presented in this report are based on a wide array of national and state data sources that are listed in Table 4. The estimates of the net fiscal contributions of Pennsylvania and U.S. adults in selected educational subgroups are based on a number of different data sources and a massive series of data calculations by the U.S. Census Bureau and the Center for Labor Market Studies of Northeastern University.

First, the primary source of data for most of the annual tax and cash/in-kind transfer data is the Annual Social and Economic Supplement to the March Current Population Survey (CPS).<sup>14</sup> We have used the U.S. Census Bureau's March CPS Supplement surveys data for the March 2005, March 2006, and March 2007 CPS. The March CPS surveys for each of these three years involved interviews with approximately 3,300-3,600 adults 18-64 years old in Pennsylvania and 126,000 persons across the entire nation.<sup>15</sup> The monthly CPS household survey is conducted by the U.S. Census Bureau for the U.S. Bureau of Labor Statistics and is the source of the monthly data on the nation's labor force, employed, and unemployed populations.

---

<sup>14</sup> For more details on the design of the March CPS supplement and the definitions for each of the variables for which data are collected. See: [www.census.gov/CPS](http://www.census.gov/CPS).

<sup>15</sup> For a review of the labor force concepts and measures underlying the monthly CPS household surveys, See: U.S. Bureau of Labor Statistics, *Employment and Earnings, January 2007*, "Appendix A," U.S. Government Printing Office, Washington, D.C., 2007.

Table 4:  
Sources and Uses of the Databases Used in This Research Report

Data Source	Use of Data
American Community Survey 2006	Provided estimates for a variety of employment, earnings, income, housing, and educational attainment measures for PA and U.S. adults.
March 2005, March 2006, and March 2006 Current Population Surveys (CPS)	Primarily used to estimate the net fiscal contributions of Pennsylvania adults by their level of educational attainment.
Urban Institute and Kaiser Foundation Commission on Medicaid and the Uninsured	Provided estimates on the cost of Medicaid services and health insurance.
U.S. Department of Treasury, Internal Revenue Service, "State and Local General Sales Taxes", Publication 600, 2006.	Used to estimate personal sales tax
U.S. Department of Justice	Used the annual report for information on the number of inmates in jails and prisons and the annual cost to house inmates.

The March CPS survey contains a supplementary set of questions that collects information from respondents on their sources of income during the previous calendar year, and their receipt of various forms of cash and in-kind assistance (energy assistance, food stamps, and housing subsidies) from local, state, and national government agencies. With the available income and employment information and marital status of respondents, the U.S. Census Bureau imputes estimates of the amount of Social Security payroll taxes, federal retirement contributions, and state and federal income taxes paid by individuals during a given calendar year. These imputed tax and cash/in-kind transfer data for calendar years 2004, 2005, and 2006 are used to estimate the net fiscal contributions of Pennsylvania adults 18-64 years old by their educational attainment level.

Second, many of the employment and earnings measures for Pennsylvania as well as a number of the housing, income, home value, property tax measures are based on the findings of the American Community Surveys for 2006. The American Community

Survey (ACS) is a national household survey conducted by the U.S. Census Bureau since 2000. During 2006, more than 104,000 households in Pennsylvania completed an ACS questionnaire that collected detailed information on the demographic (age, gender, race-ethnic origin, marital status) and socioeconomic characteristics of all household members, including their educational attainment and school enrollment status,<sup>16</sup> the employment status of all working-age adults (16 and older) at the time of the survey, their labor market experiences in the twelve month period prior to the survey, and their earnings and other sources of money income in the previous twelve months. The ACS survey data on the annual money incomes of families and the number/age distribution of family members can be used to identify the number of families and persons that were poor/near poor or low income.<sup>17</sup> The ACS public use files for 2006 were used to generate many of the estimates appearing in this report.

A third data source was the administrative data from the Urban Institute and Kaiser Foundation Commission on Medicaid and the Uninsured. This data source provided estimates of the annual cost to the Medicaid system in Pennsylvania of providing health services to the Medicaid population by disability status. We have used these data to generate the fiscal costs of providing health insurance to Medicaid recipients by educational attainment in the state of Pennsylvania.

A fourth set of data that we used in estimating sales tax was provided by U.S. Department of Treasury, Internal Revenue Service for 2006. We used 2006 ACS survey personal income data and IRS sales tax exemption data to estimate average sales tax for adults.

---

<sup>16</sup> Respondents to the ACS survey were asked to identify whether they were enrolled in school at any time in the two month period immediately prior to the survey. Persons who were not enrolled in school and who lacked a high school diploma/GED are classified as high school dropouts in this report. GED holders will be assigned to the high school graduate category if they did not complete any years of post-secondary schooling.

<sup>17</sup> The definition of a “low income family” in this report is that used by many poverty and welfare reform researchers across the country. It is a family with an annual pre-tax, money income below two times the poverty line for a family of its given size and age composition. For a review of the poverty, low income, and selected other income thresholds used by poverty researchers to define income inadequacy, See: Garth Mangum, Stephen Mangum, and Andrew Sum, The Persistence of Poverty in the United States, Johns Hopkins University Press, Baltimore, 2004.

A fifth source of data that was used in conducting this study was an administrative data base provided by the U.S. Department of Justice. This database provided information on the numbers of individuals who were inmates of jails and prisons across the state in recent years and the annual costs of housing an inmate in a Pennsylvania prison. These cost data were used to estimate the higher lifetime institutionalization costs associated with adult dropouts in the state of Pennsylvania in comparison to those of their better educated counterparts, especially among males who dominate the ranks of the jail/prison population in the state and the nation.

### **Methodology and Calculations Underlying the Estimates of the Net Fiscal Contribution of Pennsylvania and U.S. Adults**

In the March CPS supplement survey, given the self-reported information on annual earnings and incomes, sources of those incomes, the marital status of respondents, and the type of household in which the respondent lived (married couple family, single parent family, single individual), the U.S. Census Bureau calculates estimates of their Social Security payroll taxes, federal government retirement contributions, and their state and federal income tax liability.<sup>18</sup> In the case of federal and state income tax payments, the U.S. Census Bureau has a methodology for married couple families. On the assumption that married couple families file a joint tax return, the estimate of the federal and state income tax payments are assigned to the householder in a married couple family. The spouse in a married couple family is assigned a value of zero for federal and state income taxes. Using a methodology that we have developed (described in Appendix A) we have made separate estimates of the federal and state income tax liability for the householder and the spouse in married couple families. For each non-married individual the U.S. Census Bureau imputes estimates of their federal and state income tax payments and assigns these payments to their personal record.

Social Security payroll taxes and federal government retirement contributions were estimated by the U.S. Census Bureau for each individual based on their annual earnings and the source of their annual earnings. Only the employees' contribution to the

---

<sup>18</sup> For married couples, an assumption is made by the U.S. Census Bureau that the couple files a joint tax return in determining its federal income tax liability.

social security payroll tax is included in this estimate. However, employers also pay an equivalent amount of social security payroll taxes to the federal government. The employers' contribution goes to the U.S. treasury in the form of tax revenue. This social security payroll tax payment by the employer would not have been made without the employment and earnings of the employee. Therefore the employer portion as well as the employee portion of the social security payroll tax payment should be attributed to the worker.

Using the 2005-2007 March CPS survey data and the 2006 ACS survey data, we have estimated the annual tax payments for each individual between the ages of 18 and 64 (excluding 18-24 year olds who were enrolled in school at the time of the March surveys) in each of the tax categories listed in Table 5. The sum of these taxes represents the combined annual tax payments that were estimated for individuals in each of the five educational groups.

The U.S. Census Bureau does not provide any estimates of annual state sales tax payments for persons interviewed during the March CPS survey. In our fiscal impact analyses, we have estimated sales tax payments for individuals by using a combination of personal income data from the 2006 ACS survey and sales tax tables for Pennsylvania published annually by the U.S. Department of Treasury's Internal Revenue Service (IRS).<sup>19</sup> Federal taxpayers are allowed to claim state and local sales taxes paid when filing their federal income tax returns. Tax filers use published data from IRS tables to estimate their sales tax deductions based on their taxable income and the number of exemptions. Sales tax rates vary by state.<sup>20</sup> The allowable deductions for state sales taxes are based on the number of exemptions. In our analysis of state sales taxes, we applied a single person exemption to each individual respondent 18-64 years old with a positive income. For each person in each state in our analysis, we assigned a state sales tax payment equal to the IRS sales tax deduction for a person with their income in 2006. In computing the national sales tax payment amounts we calculated these sales tax payments separately for each of the 45 states that had a state sales tax in 2006.

---

<sup>19</sup> U.S. Department of Treasury, Internal Revenue Service, "State and Local General Sales Taxes", Publication 600, 2006, [www.irs.gov](http://www.irs.gov).

<sup>20</sup> Alaska, Delaware, New Hampshire, Montana, and Oregon did not have a state sales tax in 2005.

Table 5:  
Income, Payroll, Sales, and Property Tax Payments to the Federal Government and State and Local Governments that are Used in the Computation of the Net Fiscal Impacts

Federal Government	State and Local Governments
Federal income tax payments	State income tax liability
Federal retirement payroll deductions	Property tax liability
Social Security retirement payroll taxes	State Sales tax payments

The U.S. Census Bureau also does not provide estimates of the annual property taxes paid by households that own their homes. These data are not collected as part of the March CPS supplement on earnings and incomes. We have utilized findings from the 2006 American Community Surveys (ACS) on home ownership rates of households and their annual property tax payments to compute their expected annual property tax payments.<sup>21</sup> The property tax payments are assigned to the householder in each household that owned the housing unit they occupied at the time of the 2006 ACS survey.

The U.S. Census Bureau also has used the March CPS supplement to collect data from respondents on their receipt of a wide array of cash income transfers from local, state, and federal governments, including unemployment insurance payments, Temporary Assistance to Needy Families (TANF) benefits, Supplemental Security Income (SSI) payments for the aged and the disabled, Social Security Disability payments, general relief, and veteran’s payments. The combined annual incomes from each of these cash income transfer programs (listed in Table 6) were calculated for each respondent. In addition to the cash transfer payments, the March CPS questionnaire collected information on respondents’ receipt of a wide array of in-kind transfers from state and federal governments, including food stamps, federal Earned Income Tax Credits (EITC) Medicaid/Medicare health insurance benefits, energy assistance and rental subsidies.<sup>22</sup>

---

<sup>21</sup> The expected values of these property tax payments are the product of the home ownership rate for a given group and the mean value of their property tax payments.

<sup>22</sup> The federal Earned Income Tax Credit (EITC) is primarily a cash tax credit refunded to low earner households by the Internal Revenue Service. The federal EITC is treated as a cash transfer rather than a negative tax by the U.S. Census Bureau in its calculations of the taxes paid and transfers received by individuals. For a review of the design and operations of the federal EITC program, see: Saul Hoffman and Laurence S. Seidman, Helping Working Families: The Earned Income Tax Credit, W.E. Upjohn Institute for Employment Research, Kalamazoo, 2003.

Table 6:  
Cash and Non-Cash Transfers Received by Individuals or Households  
that are Used in the Computation of the Net Fiscal Impacts

Cash Transfers	Non-Cash Transfers (In-Kind Benefits)
Unemployment benefits	Market value of food stamps
Worker's compensation	Market value of Medicare insurance
Social Security payments	Market value of Medicaid benefits
Supplemental Security Income for the disabled and aged	Family market value of housing subsidies
Public assistance income (TANF, general relief)	Family market value of school lunch subsidies
Veteran's payments	Energy assistance payments
Survivor's income benefits	
Other disability income	
Federal Earned Income Tax Credits	

The U.S. Census Bureau has imputed cash values for each of these in-kind benefits. They are primarily assigned to the household unit rather than to individual household members. We have assigned most of these in-kind transfers to the householder.<sup>23</sup> We then summed the cash values of each of these in-kind benefits and added them to the estimated value of cash income transfers for each household member.

Finally, we also estimated jail/prison costs for adults in both Pennsylvania and the U.S. adults in the five educational groups using ACS and U.S. Justice Department's statistics on jail/prison costs by state. The final fiscal ledger for estimating fiscal costs is presented in Table 7. Details about the specific of the series of computations that were undertaken to produce estimates of federal and state income tax payments, property tax payments, sales tax payments, costs of Medicaid, estimates of jail and prison costs, and the lifetime net fiscal contributions of adults in the five educational subgroups are presented in Appendix A through F.

---

<sup>23</sup> Medicaid/Medicare expenditures are assigned to an individual household member by the U.S. Census Bureau.

Table 7:  
A Listing of the Tax Payments, Cash Transfer, Non-Cash Transfer,  
and Jail/Prison Cost Items Used in the Computation of the Net Fiscal Impact

<b>(A) Total Tax Payments</b>
+ Mean Federal Income Tax Payments
+ Mean State Income Tax Payments
+ Mean Federal Government Retirement Contribution
+ Mean Social Security Payroll (Include Employer Contribution)
+ Mean Expected Property Tax Payment
+ Mean Sales Taxes
<b>(B) Total Transfers/Jail or Prison Cost</b>
+ Mean Non-Cash Transfers
+ Mean Cash Transfers
+ Mean Jail/Prison Cost (for 18-60)
<b>Taxes Paid -Transfer/Jail or Prison Cost (A-B)</b>
<b>Ratio of Taxes Paid to Transfer/Jail or Prison Cost (A/B)</b>

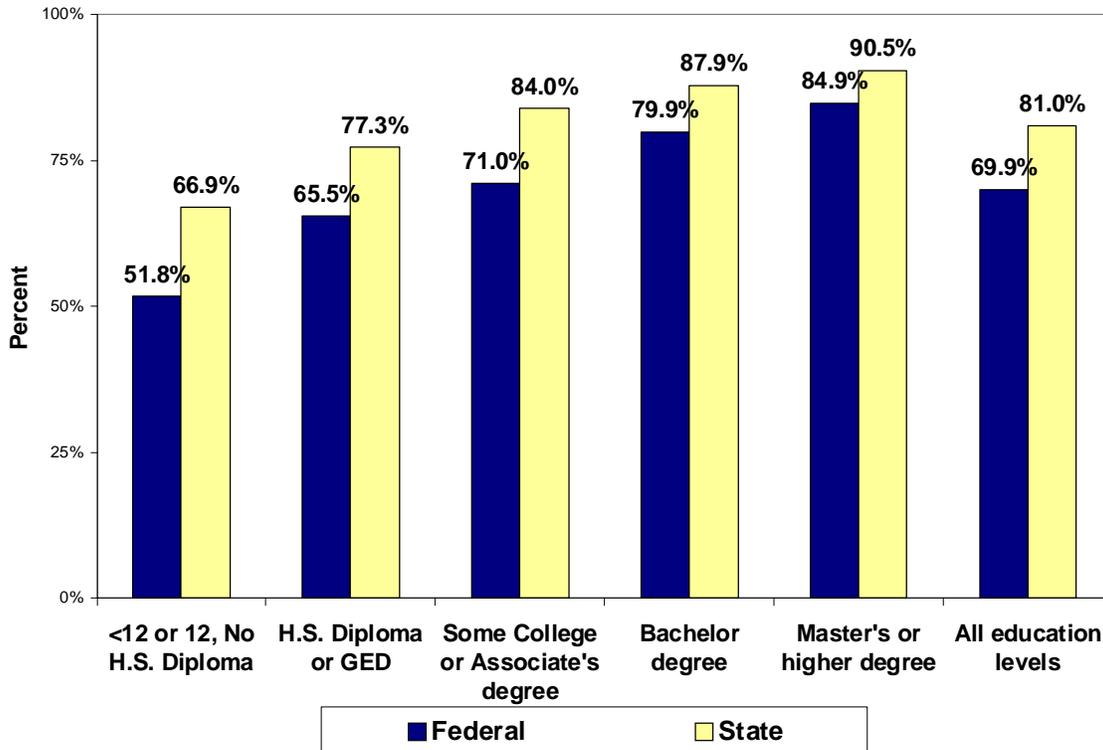
### **Incidence of Tax Payments of Pennsylvania Adults by Educational Attainment**

In this section we present the proportion of Pennsylvania residents in each educational category that paid the five types of taxes that are included in our computation of fiscal impacts of achieving alternative levels of educational attainment. The data presented in Charts 2 and 3 and Table 8 clearly demonstrate that the proportion of Pennsylvanians that paid the different types of taxes increased sharply with educational attainment. The level of earnings and incomes of individuals determine the likelihood that they would pay taxes. Analysis presented in a previous section clearly demonstrates that earnings rose steadily and sharply with increases in education. Consequently the proportion of individuals that contribute to the public coffers through taxes should also increase with increases in educational attainment.

The federal personal income tax payment was made by nearly 70 percent of Pennsylvanians (aged 18 to 64) per year during the 2004-2006 period. The share of the state's non elderly residents who were federal income taxpayers varied widely by educational attainment. Just a little over one-half of high school dropouts in Pennsylvania

had paid any federal personal income tax compared to nearly two-thirds of high school graduates, and 71 percent of those who completed some college below the bachelor's degree level. College graduates whose earnings were 3 to 4 times higher than that of high

**Chart 2:**  
**Percent of 18- to 64-Year Old Pennsylvania Residents Who Paid**  
**Any Federal or State Income Tax (3-year average 2004-2006)**



Source: March Supplement to the Current Population Survey, 2005, 2006, 2007. Tabulations by authors.  
Note: 18- to 24-year old students were excluded from the analysis.

school dropouts were also significantly more likely to pay federal income taxes. Nearly 8 out of 10 Pennsylvanians with a bachelor's degree and 85 percent of those with a post-graduate degree (master's or higher) had contributed to the U.S treasury by paying the annual federal income tax in the 2004-2006 period. Residents in each of the four higher educational attainment groups were considerably more likely to pay the federal income tax than were high school dropouts. Relative to high school dropouts, the likelihood of paying the federal income tax was 14 percentage points higher among high school graduates, 28 percentage points higher among college graduates with a bachelor's degree, and 33 percentage points higher among college graduates with a master's or higher

degree. The proportion of the adult population who paid any Pennsylvania state tax also increased steadily by educational attainment, albeit not as sharply as the increase in the likelihood (by educational attainment) of paying the federal income tax. Underlying the larger increase in the share of federal income tax payers by educational attainment compared to the share of state income tax payers is the progressive nature of the federal income tax and the flat or proportional rate structure of the Pennsylvania state income tax (3.07 percent in the years included in the analysis in this report—2004, 2005, 2006). Although the tax forgiveness provision of the Pennsylvania tax code makes the state's income tax somewhat progressive, only 23 percent of all 2005 Pennsylvania state personal income tax returns were filed as tax forgiveness returns (1.334 million tax forgiveness returns out of 5.730 million total returns filed).<sup>24</sup> Moreover, some of the tax forgiveness returns filers may have been eligible for only partial tax forgiveness meaning that they did pay the state tax albeit over a smaller portion of their incomes.

Over eight out of ten adult residents of Pennsylvania had paid some state personal income tax during the calendar year over the 2004-2006 period. Among high school dropouts, two-thirds had paid any state income tax during the year over the 2004-2006 period; 10 percentage points lower than the share of high school graduates who had made annual state tax payments over the same period. The incidence of tax payments increased steadily as educational attainment increased. Pennsylvanians with some college below the bachelor's degree level had a state income tax payment incidence of 84 percent; higher than high school dropouts and high school graduates, but lower than those with bachelor's degree or a master's or higher degree. Nearly 88 percent of Pennsylvania residents with a bachelor's degree and 91 percent of those with a master's or higher academic degree paid annual state income taxes over the 2004-2006 period.

The social security payroll tax is also a proportional tax on earnings up to a maximum threshold or the social security wage base that is increased each year based on the rate of inflation.<sup>25</sup> Although there is an upper income limit on taxable earnings

---

<sup>24</sup> Tax Forgiveness is a credit that allows eligible taxpayers to reduce all or part of their Pennsylvania state tax liability, see: [http://www.revenue.state.pa.us/revenue/lib/revenue/2005\\_PIT\\_Booklet.pdf](http://www.revenue.state.pa.us/revenue/lib/revenue/2005_PIT_Booklet.pdf)

<sup>25</sup> The 6.2 percent tax is paid by employee and is matched by a 6.2 percent tax payment by the employer. There is no upper income limit on Medicare taxes where the employer and employee each pay 1.45 percent

(\$97,500 in 2007 and \$102,000 in 2008), the social security payroll tax liability begins with the very first dollar of earnings on jobs that are subject to the FICA (Federal Insurance Contributions Act) tax. Thus, the proportion of individuals who pay the FICA tax is quite large. Over 79 percent of all 18- to 64-year old adults made social security payroll tax payments in Pennsylvania (Table 8). The percent of Pennsylvanians paying this tax ranged from less than 60 percent of high school dropouts, to 77 percent of high school graduates, to 83 percent of those with some college education below the bachelor's degree level, to 86 percent among those with a bachelor's or master's or a higher degree.

Federal retirement taxes that are paid by federal government employers were paid infrequently by Pennsylvania residents. Less than one percent of Pennsylvania's adults paid federal retirement taxes with the incidence of this tax ranging from 0.3 percent among high school dropouts to 1.6 and 1.2 percent, respectively, among college graduates with a bachelor's degree and a master's degree.

Table 8:  
Percent of 18- to 64-Year Old Pennsylvania Residents Who Paid Any Social Security Payroll Tax and Federal Retirement Tax (Average 2004-2006)

Educational Attainment	Social Security Payroll Tax	Federal Retirement Tax Payments
<12 or 12, No H.S. Diploma	59.9%	0.3%
H.S. Diploma or GED	76.7%	0.7%
Some College or Associate's degree	83.0%	0.7%
Bachelor degree	86.3%	1.6%
Master's or higher degree	86.0%	1.2%
All education levels	79.2%	0.9%

Source: March Supplement to the Current Population Survey, 2005, 2006, 2007. Tabulations by authors.

Note: 18- to 24-year old students were excluded from the analysis.

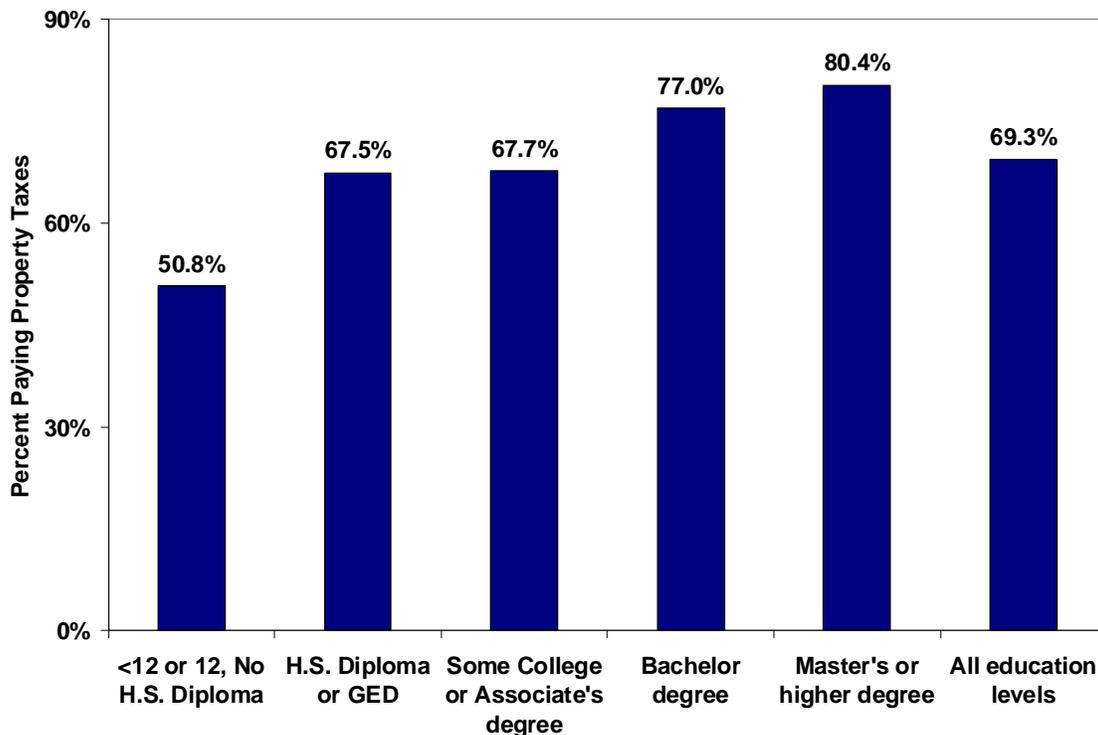
The incidence of property tax payments is directly associated with property ownership. As noted in an earlier section of this paper, the higher earnings and incomes of better educated adults means that they are likely to own their homes and therefore

---

on all earnings. See: Social Security Online Electronic Fact sheet. Available at: <http://www.ssa.gov/pubs/10003.html>.

more likely to pay property tax. Given this, it is not surprising that our analysis found wide differences in the incidence of property tax payments by level of educational attainment of the householder. Compared to high school dropouts, the incidence of property tax payments was 30 percentage points higher among householders with a post-graduate degree, 27 percentage points higher among householders with a bachelor's degree, and 17 percentage points among householders who had graduated from high school with a diploma or a GED with no postsecondary education.

**Chart 3:**  
Percent of 18- to 64-Year Old Householders in Pennsylvania Who Paid Any Property Tax on Owned Homes in 2006 by Educational Attainment



Source: 2006 American Community Survey Public Use Microdata Samples (PUMS) Data Files. Tabulations by authors.

## **Annual Tax Payments of Pennsylvania Adults by Educational Attainment**

Not only were better-educated Pennsylvanians more likely to pay the federal, state, and local taxes but they also paid much higher amounts of these taxes over the year.

We have estimated the mean amount of annual federal and state income taxes, social security payroll tax, federal government retirement tax contribution, property tax, and sales tax payments by Pennsylvania adult residents. The methodologies underlying the computations of these estimates are described in detail in Appendices A, B, and C. Findings presented in Table 9 highlight the sharp differences in the amount of these taxes that were paid by Pennsylvanians with different levels of educational attainment.

During the 2004-2006 period, the mean annual federal income tax paid by Pennsylvanians was only \$2,500 among high school dropouts compared to \$3,600 among high school graduates, \$4,300 among those with some college education below bachelor's degree level, \$6,700 among those with a bachelor's degree, and nearly

Table 9:  
Estimates of Mean Annual Tax Payments of Adult (18-64) Residents of Pennsylvania, by  
Type of Tax Paid and Educational Attainment (2004-2006 Averages in 2006 Dollars)

Educational Attainment	Federal Income Tax Payments	State Income Tax Payments	Federal Government Retirement Contribution	Social Security Payroll Tax Payments*	Mean Expected Property Tax Payment**	Mean Sales Taxes***
12 or 12, No HS						
Diploma	\$2,498	\$746	\$4	\$2,557	\$1,028	\$273
HS Graduate or GED	\$3,568	\$984	\$30	\$3,685	\$1,492	\$337
1-3 Years of College	\$4,320	\$1,170	\$28	\$4,680	\$1,772	\$388
Bachelor's Degree	\$6,718	\$1,582	\$77	\$6,589	\$2,664	\$495
Master's or Higher	\$13,994	\$2,561	\$86	\$8,964	\$3,274	\$641
All education levels	\$5,255	\$1,271	\$41	\$4,870	\$1,877	\$398

Notes: (i). Federal, state, payroll, and retirement taxes are 3-year averages (CPS March Supplements 2005, 2006, and 2007). Persons 18-24 year old enrolled in school are excluded from the analysis; (ii) Property tax data are estimated from ACS 2006; (iii). Sales taxes data estimated from ACS 2006 using IRS sales tax exemption for 2006.

\* Includes employer contribution

\*\* For all 18-64 year old adults

\*\*\*For non-enrolled 18-64 year old individuals

\$14,000 among those with a master's or higher degree. High school graduates in Pennsylvania made federal income tax payments that were on average 43 percent higher than those paid by high school dropouts, those who had some post secondary schooling

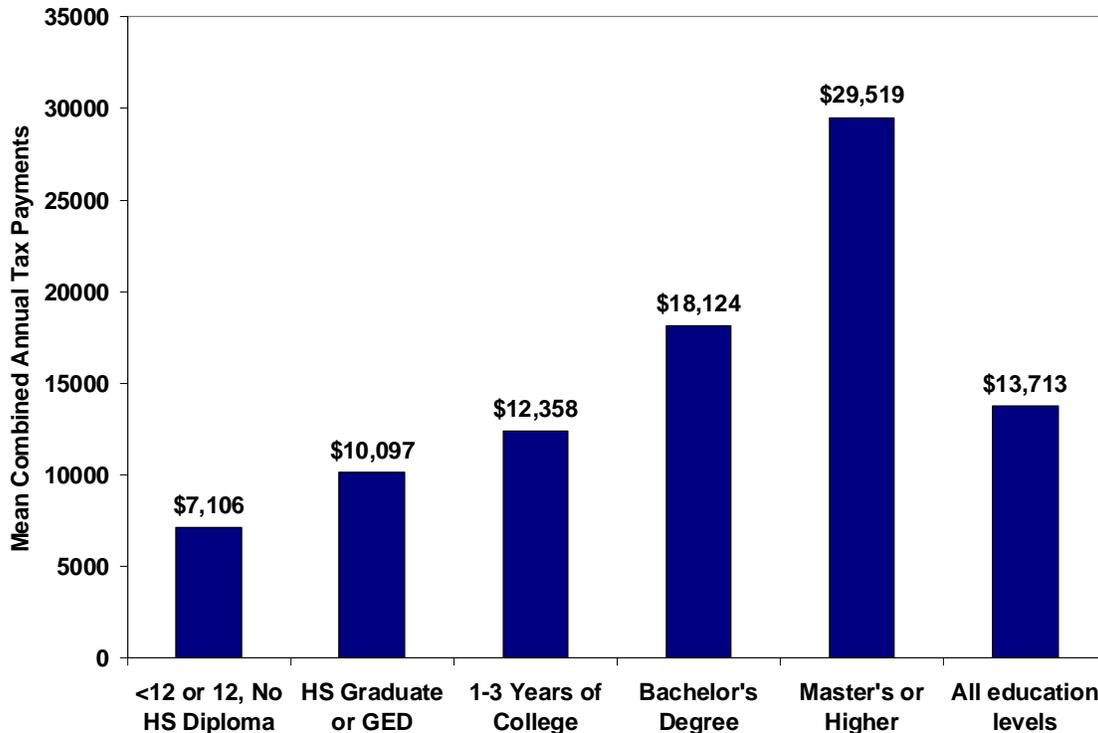
below the bachelor's degree paid 73 percent more federal income tax on average than did their dropout counterparts. Pennsylvania residents with a bachelor's degree paid nearly 2.7 times more in federal tax payments than did their dropout counterparts. The much higher annual earnings of those Pennsylvania residents who earned a master's, doctoral, or professional degree meant that these individuals paid 5.6 times more in federal income tax payments than high school dropouts within the non elderly adult population of the Commonwealth.

The gaps between the mean amount of state income taxes, social security payroll taxes, property taxes, and sales taxes paid by Pennsylvanians across the five educational subgroups were also quite large albeit not as large as the gaps between the amounts of their federal income tax payments. The larger relative differences in federal income tax payments made by better educated state residents (compared to the other federal and state tax differences) are primarily the consequence of a more progressive federal tax structure that applies a higher tax rate to higher earning/better educated individuals

Despite the less progressive nature of the state income, sales and property taxes and the federal FICA and federal retirement tax better educated residents of the state paid much more in these taxes compared to high school dropout residents. Relative to high school dropouts, the best-educated Pennsylvanians (with a master's or higher degree) paid 3.4 times higher state income taxes, 3.5 times higher social security payroll taxes, 3.1 times higher property taxes, and 2.3 times higher sales taxes.

The mean combined tax payments by educational attainment represent the total tax payments in the form of federal, state, and local contributions made by individuals in each educational group and are provided in Chart 4. The mean combined tax payment by each Pennsylvania adult was \$13,713. High school dropouts made a combined tax payment of just \$7,106, which represents a little more than half of the mean combined tax payment of all Pennsylvania adults (\$13,713). The mean combined tax payment among high school graduates was \$10,100 or 42 percent higher than the amount paid by high school dropouts.

Chart 4:  
Estimates of Mean Combined Annual Tax Payments of  
Adult (18-64) Residents in Pennsylvania (2004-2006 Averages in 2006 Dollars)



The mean combined annual tax payments include federal and state income taxes, social security payroll taxes, federal government retirement contributions, local property taxes, and state sales taxes.

Notes: (i). Federal, state, payroll, and retirement taxes are 3-year averages (CPS March Supplements 2005, 2006, and 2007). Persons 18-24 year old enrolled in school are excluded from the analysis; (ii) Property tax data are estimated from ACS 2006; (iii). Sales taxes data estimated from ACS 2006 using IRS sales tax exemption for 2006.

Postsecondary education, even among those who had some college but had not earned a bachelor's degree, was associated with a considerably higher tax payment. These individuals made payment of \$12,360 or 74 percent more than high school dropouts and 22 percent higher than high school graduates, with no additional schooling. Pennsylvanians with a bachelor's degree paid an average of \$18,100 in tax payments and those with a master's or higher degree paid an average of \$29,500 in combined annual taxes each year during the 2004-2006 period. On average for every \$1 in taxes paid by a high school dropout in Pennsylvania, high school graduates paid \$1.42, bachelor's degree holders paid \$2.55, and post-graduate degree holders paid \$4.15.

The contributions of high school dropouts to the federal, state, and local governments in the form of tax payments are significantly smaller than that of their better-educated counterparts. Across each of the six types of taxes that we have included in this analysis, the amount of taxes paid by better-educated adult Pennsylvanians were considerably higher than those paid by high school dropouts. Across the various tax types, the mean tax payments of college graduates with a master's or higher degree were between 235 percent and 560 percent greater than those paid by high school dropouts. Even high school graduates paid taxes that were between 23 percent and 45 percent higher than the amounts paid by high school dropouts. The low levels of employment and earnings of high school dropouts in Pennsylvania clearly translate into a very low incidence of tax payment and much lower dollar amounts of taxes paid when such payments are made. On the contribution side of the fiscal ledger, poorly-educated adult residents of Pennsylvania, particularly high school dropouts were least likely to pay taxes and made the smallest average tax payments across each category of taxes compared to their better-educated counterparts.

## **The Receipt of Cash and Non-Cash Government Transfer Payments Among Pennsylvania Adults by Educational Attainment**

### **Cash Transfers**

We emphasized in earlier sections of this study the strong connections between the level of educational attainment of Pennsylvania residents and their labor market success. We found that as a result of their higher earnings and incomes, better-educated Pennsylvanians were much more likely to pay federal, state, and local taxes than those who were poorly-educated especially those who failed to graduate from high school. Moreover better educated adult residents of the state also made larger tax payments and therefore made larger revenue contributions to the budgets of the federal, state, and local governments.

In this section we present our analysis of the other side of the budget ledger—government transfer payments in the form of cash and in-kind benefits—received by Pennsylvania residents relative to their level of educational attainment. Our analysis of transfers includes 9 cash transfers and 6 non-cash (in-kind) transfers. The entire list of

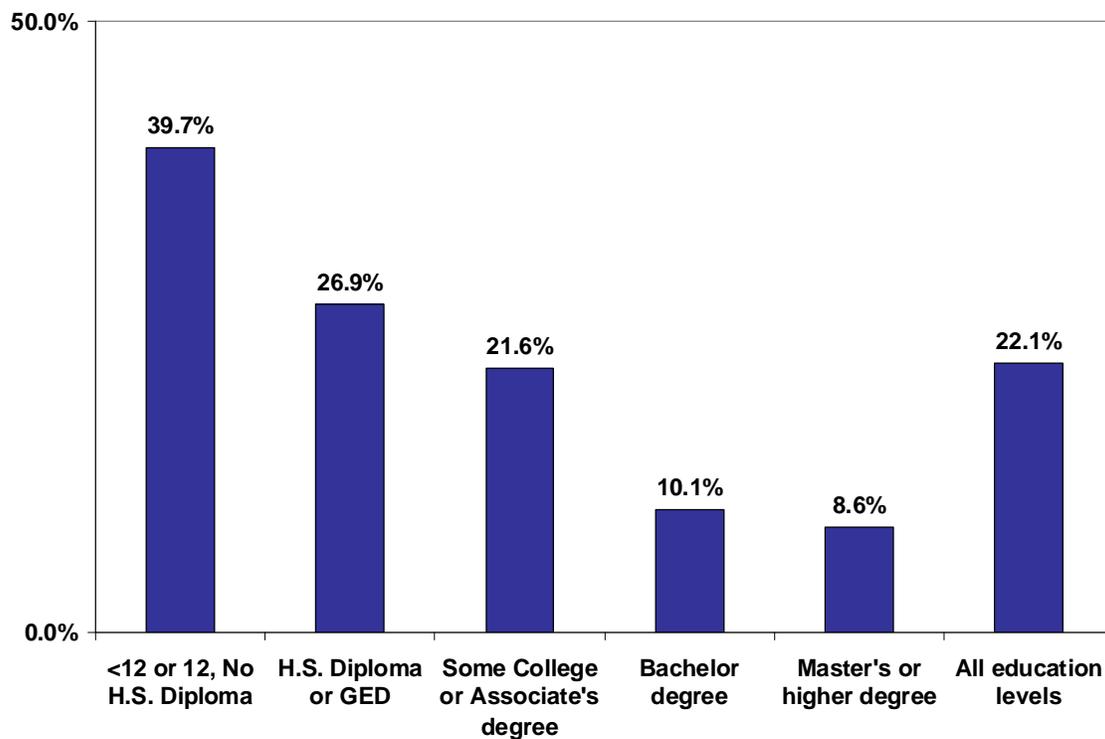
these cash and non-cash transfers is presented in Table 6. In order to receive a government transfer payment, the applicant must meet a variety of program eligibility guidelines. Income is a recurring and important component of most eligibility criteria for government transfer payments to the non elderly population of the state. Indeed, these programs are often referred to as ‘means-tested transfer programs.’ Non elderly individuals and families with lower incomes are more likely to be eligible to receive both cash and non-cash government transfers. Given the lower levels of employment and earnings among the poorly-educated compared to their better-educated counterparts, poorly educated individuals would be more likely to be eligible for, and therefore more likely to receive, government transfers. In fact the proportion of working age Pennsylvanian adults who received government transfers was highest among high school dropouts and declined sharply among better-educated groups.

We begin by estimating the share of the state’s non elderly adult population who received money income from a federal or state income transfer program. These cash programs include: earned income tax credit, unemployment insurance compensation, TANF/AFDC payments, veteran’s payments, and supplemental security income. We also include those OASDI payments made to Pennsylvania residents under age 65. This includes cash payment to residents under the social security widows and survivors insurance programs as well as to those eligible for payment under the social security disability insurance program. In addition, some residents between the ages of 62 and 64 received cash payments under social security’s old age retirement insurance program by opting to receive reduced retirement benefits relative to those available to them at the normal retirement age of 65.

The receipt of cash transfer payments varied widely across educational groups of Pennsylvania adults. The least educated adults were the most likely to receive cash transfer payments. Nearly four out of ten Pennsylvania dropouts received one or more cash transfer payments. The percentage of individuals receiving cash transfer payments was 27 percent among high school graduates (with no postsecondary education) compared to 40 percent of their counterparts who failed to complete high school – a difference of 13 percentage points. The share of cash transfer recipients was 22 percent among Pennsylvania adults (18-64) with some college education below the bachelor’s

degree level, 10 percent among college graduates with a bachelor's degree, and 8.6 percent among those with a master's or a higher college degree. High school dropouts in the state were 4.6 times more likely than their counterparts with a post-graduate degree, nearly 4 times as likely as those with a bachelor's degree, and 1.5 times more likely than high school graduates (without any postsecondary education) to collect one or more cash government transfer payment.

Chart 5:  
Percent of Adult (18-64) Residents in Pennsylvania who Received Cash Transfers, by Educational Attainment (2004-2006 Averages)



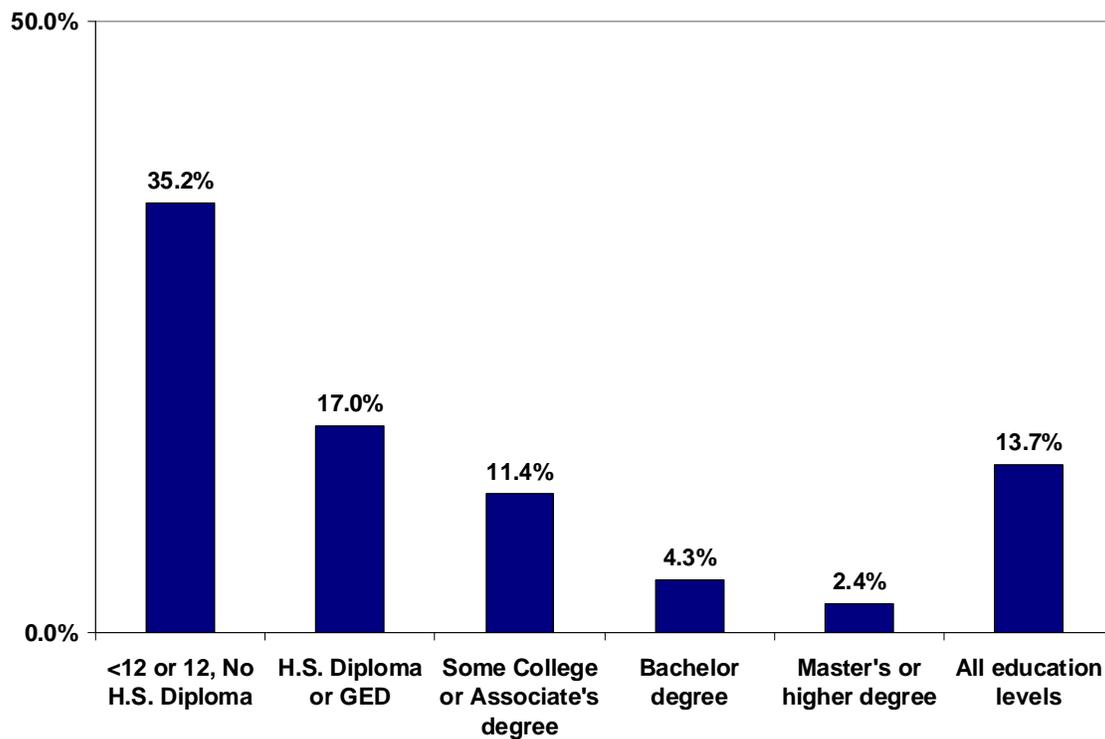
Notes: (i) Cash transfers are 3-year averages (CPS March Supplements 2005, 2006, and 2007). Persons 18-24 year old enrolled in school are excluded from the analysis.

### **Non Cash Transfers**

The share of adults receiving in-kind or non-cash transfers was lower than the proportion of cash transfer recipients among all Pennsylvanians and among each of the five educational subgroups. Nearly 14 percent of all adult Pennsylvanians had reported receiving one or more in-kind transfers such as Medicaid or Medicaid benefits, food

stamps, energy assistance, housing subsidies, or school lunch subsidies. While on average about one in seven non elderly adults in Pennsylvania received a non cash transfer benefit the rate of receipt of non cash transfers among the non elderly population varies sharply by level of educational attainment.

**Chart 6:**  
Percent of Adult (18-64) Residents in Pennsylvania who Received Non Cash Transfers,  
by Educational Attainment (2004-2006 Averages)



Notes: (i) Non-cash transfers are 3-year averages (CPS March Supplements 2005, 2006, and 2007). Persons 18-24 year old enrolled in school are excluded from the analysis.

Our analysis of the data found that 35 percent of residents who fail to complete high school in the Commonwealth received a non cash transfer benefit. However, this proportion fell to half that amount among high school graduates without any college education. Only about 11 percent of those with some college education below the bachelor's degree level received in-kind transfer benefits. Among college graduates the incidence of non cash benefit receipt was quit low with just 4 percent of those with a bachelor's degree, and only 2 percent among the best-educated Pennsylvanians (with a

master's or higher degree) participating in some type of in-kind benefit transfer program. High school dropouts in the state were nearly 15 times more likely than college graduates with a master's or higher degree, nearly 9 times more likely than college graduates with a bachelor's degree, and twice as likely as high school graduates to collect non-cash transfers at any time during the year over the 2004-2006 period.

## **The Incidence and Costs of Institutionalization in Pennsylvania**

The nation's incarceration rates have increased sharply over the past 25 years. The number of inmates incarcerated in federal and state prisons per 100,000 population more than tripled from 139 in 1980 to 501 in 2006.<sup>26</sup> These totals do not include individuals who were incarcerated in local jails. The total incarceration rate (including federal and state prisons and local jails) increased from 600 per 100,000 population in 1996 to 752 per 100,000 in 2006; representing a one-quarter increase.<sup>27</sup>

This increase in incarceration imposes considerable costs on society in the form of monetary costs of building and operating prisons and jails as well as human costs in the form of forgone wages of those who are institutionalized, reduced future opportunities for inmates after release, and many different types of social costs that are difficult to quantify. Institutionalization is more likely to be concentrated among poorly educated individuals, particularly high school dropouts. As noted in a previous section, a large majority of the nation's inmates lack a high school diploma. According to the Bureau of Justice Statistics in 1997, 41 percent of the nation's inmates in federal and state prisons and local jails did not have a high school diploma and another 24 percent had obtained only a GED. Thus, nearly two-thirds of the nation's inmates did not earn a high school diploma. This concentration of high school dropouts among inmates is considerably larger than the 18 percent share of high school dropouts in the general population age 18 or older.<sup>28</sup>

---

<sup>26</sup> Key Facts at a Glance, Incarceration Rate, 1980-2006, Correctional Populations in the United States and Prisoners in 2006, Bureau of Justice Statistics, December 2007.

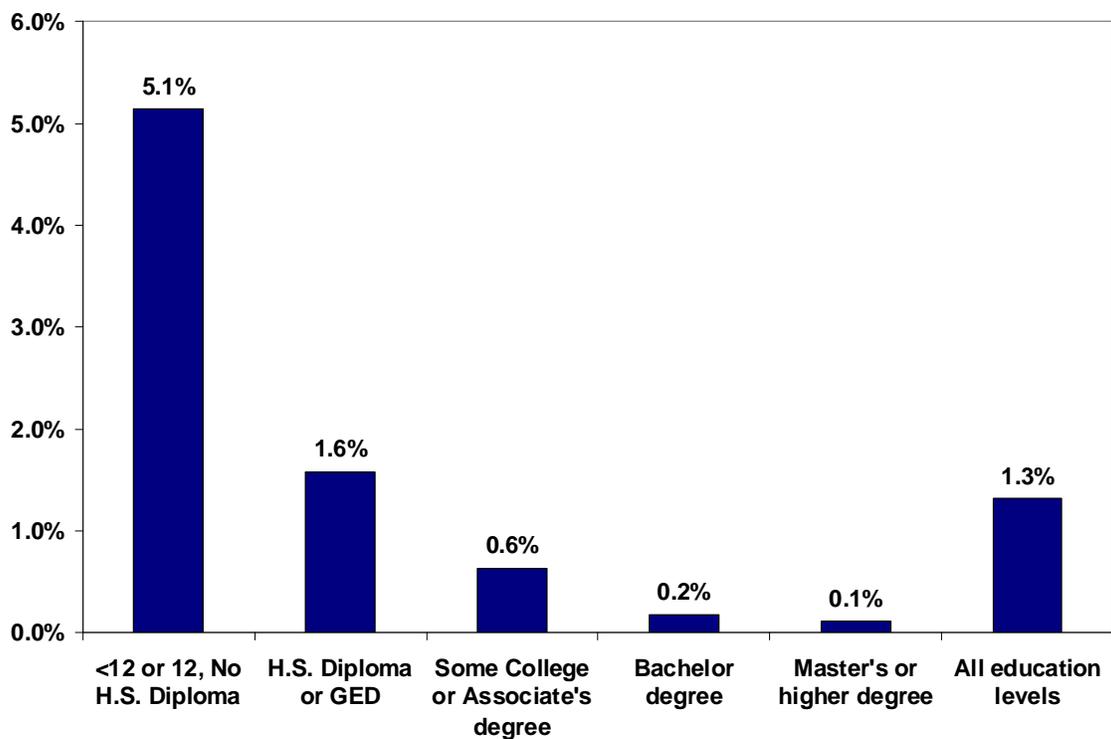
<http://www.ojp.usdoj.gov/bjs/glance/tables/incrttab.htm>

<sup>27</sup> Darrell K. Gilliard and Allen J. Beck, *Prison and Jail Inmates, 1995*, Bureau of Justice Statistics Bulletin, August 1996, NCJ-161132; William J. Sabol, Todd D. Minton, and Paige M. Harrison, *Prison and Jail Inmates at Midyear 2006*, Bureau of Justice Statistics Bulletin, June 2007, NCJ 217675.

<sup>28</sup> Caroline Wolf Harlow, *Education and Correctional Populations*, Bureau of Justice Statistics, Special Report, January 2003, NCJ 195670.

We have estimated the rates of institutionalization among the non-elderly (18-60) population in Pennsylvania from the 2006 American Community Survey, which interviewed residents of group quarters during the year. Group quarter residents in the ACS include persons who were in correctional facilities (jails and prisons), nursing facilities, psychiatric hospitals, in-patient hospice facilities, and group homes for juveniles. The ACS survey public use data files unfortunately do not identify the type of

Chart 7:  
Institutionalization Rates of 18-60 Year Old Adults in Pennsylvania, by Educational Attainment 2006 (rates per 100 members of the 18- to 60-year old population)



Source: 2006 American Community Survey (ACS) Public Use Microdata Samples (PUMS) data files. Tabulations by authors.

institution in which group quarter residents lived at the time of the survey. However, a substantial majority of the adult institutionalized population under age 60 consisted of inmates of correctional facilities. Therefore we have used the ACS PUMS data files to estimate the incidence of institutionalization among 18-60 year old residents of Pennsylvania by their educational attainment.

The findings reveal that overall 1.3 percent of the 18- to 60-year old population of Pennsylvania was institutionalized at the time of the 2006 ACS survey. The rates of institutionalization of these adults varied from a high of over 5 percent among high school dropouts, to 1.6 percent among those with just a high school diploma or a GED, to 0.2 percent and 0.1 percent, respectively, among college educated adults with a bachelor's degree and with a master's or a higher degree.

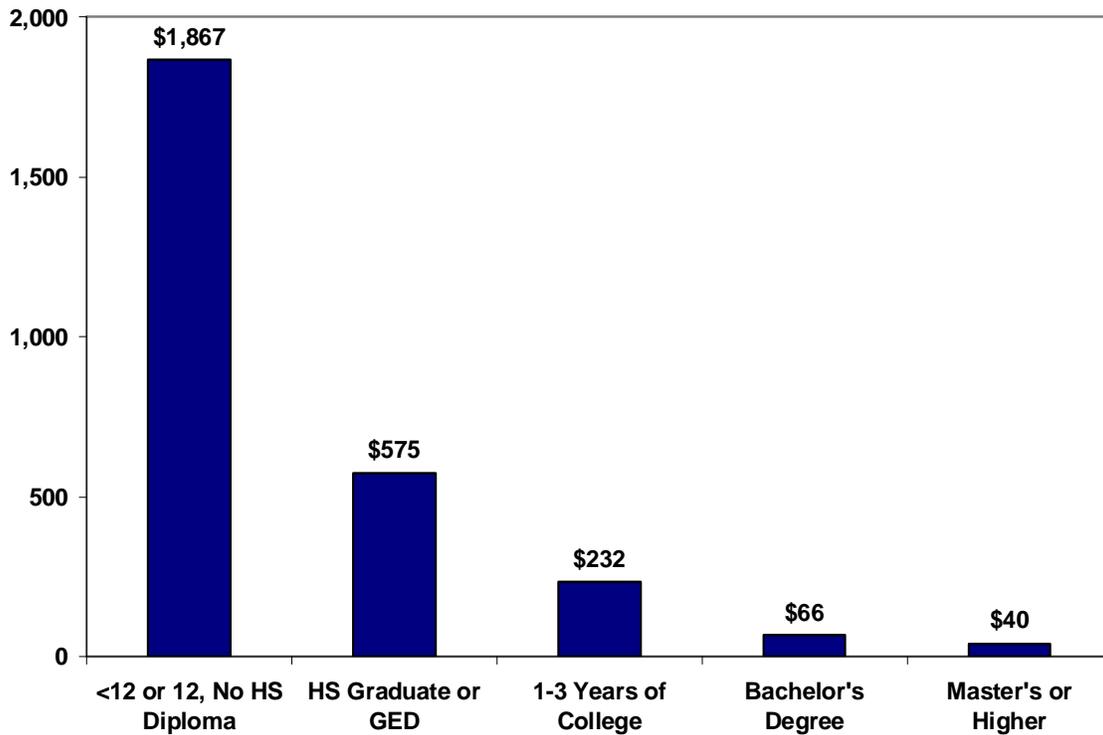
One of the components in our fiscal impact analysis is the per capita cost of institutionalization, that is, the cost per resident aged 18 to 64 in Pennsylvania associated with the incarceration of an individual within that educational group. The increase in the numbers of residents incarcerated has resulted in an increase in the total incarceration costs and per capita costs as well. Assuming that per inmate costs remain the same, the increased rates of incarceration raises the per capita costs of incarceration for a given educational group within the non elderly adult population in the state. Since disproportionate numbers of inmates are high school dropouts, the group costs and per capita costs of incarceration and institutionalization are expected to be higher among high school dropouts than among better-educated adults.

Utilizing the Bureau of Justice Statistics estimate of the annual expenditures per inmate for Pennsylvania in 2001 and adjusting this per inmate cost for inflation between 2001 and 2006, we have derived a per inmate cost of incarceration for Pennsylvania of \$36,313 in 2006. By multiplying this per inmate cost by the number of institutionalized adults in each educational group we derived the total institutionalization cost for that educational group. We then divided this total institutionalization cost in each educational group by the total number of adult Pennsylvanians in the educational group to obtain mean per capita institutionalization cost (or mean institutionalization cost per person) in each educational group.

Findings presented in Chart 8 reveal wide differences in the costs of institutionalization of adults by educational attainment. The high rate of institutionalization among high school dropouts resulted in a very high annual average cost of institutionalization per adult high school dropout in Pennsylvania (\$1,867). The annual institutionalization cost among adult high school graduates, with no college

education, was much lower (\$575). Among college educated adults residents of Pennsylvania, the average annual cost of institutionalization per person was \$232 among adults with a below bachelor’s degree level college education, \$66 per year among college graduates with a bachelor’s degree, and only \$40 among college graduates with a master’s or higher academic degree.

Chart 8:  
Mean Annual Costs of Maintaining 18-60 Year Old Adults in Institutions in Pennsylvania, by Educational Attainment 2006



Note: Jail and prison cost data are estimated for 18-60 year olds from the 2006 American Community Survey micro data files and the Bureau of Justice Statistics (BJS) cost estimates for 2001 adjusted for inflation to 2006 dollars.

The mean annual cost of institutionalization among Pennsylvania adults without a high school diploma was 3.2 times as high as that of high school graduates without any college education, and 28 times higher than that of adults with a bachelor’s degree.

## **The Mean Net Fiscal Contributions of Adults by Educational Attainment**

Using the mean annual tax payments, mean values of cash and in-kind transfers, and mean per capita annual costs of institutionalization, we have estimated the net fiscal contribution to the federal, state, and local governments for each working age educational group of adult Pennsylvania residents. Utilizing the same methodology, we have also produced the net fiscal contribution by educational attainment for all adult (18-64) residents of the U.S.

Findings presented in Table 10 reveal that over the 2004-2006 period, the mean annual tax payments made by all Pennsylvania adults (18-64) was \$13,713 whereas the mean value of their cash and in-kind transfers and their institutionalization costs was \$3,317, yielding a net fiscal contribution of \$10,396. Nationwide, the mean annual tax payments (\$13,600), the mean value of transfers and institutionalization costs (\$3152), and the net fiscal impact of adults (\$10,448) were quite similar to that for Pennsylvania adults.

The value of the net fiscal contributions of non elderly adults in Pennsylvania varied widely according to their level of educational attainment. The net fiscal contribution of the average working age adult without a high school diploma was negative (-\$683) indicating that mean annual tax payments were \$683 lower than the sum of the mean value of annual transfers and the annual institutionalization costs. Adults in the remaining 4 educational groups had positive net fiscal contributions albeit of varying magnitudes. These adults collected less in transfers and imposed smaller institutionalization costs than the amounts contributed in the form of tax payments. Adults with only a high school education and no postsecondary education annually contributed \$6,067 more in tax payments than the sum of what was received in the form of transfers and the costs that they imposed for institutionalization. The net fiscal contribution of adults with below bachelor's level college education was \$9,485 per year. College graduates with a bachelor's degree or a master's or higher degree made sizable positive net contributions to the federal, state and local governments (\$16,962 and

\$28,183, respectively). They collected less in transfers, imposed lower institutionalization costs, and paid much larger amounts in taxes, largely the result of their high degree of success in the labor market.

Table 10:  
The Mean Net Annual Fiscal Contributions of 18-64 Year Old Adults in Pennsylvania and the U.S. by Educational Attainment, Annual Averages, 2004-2006 (Dollars)

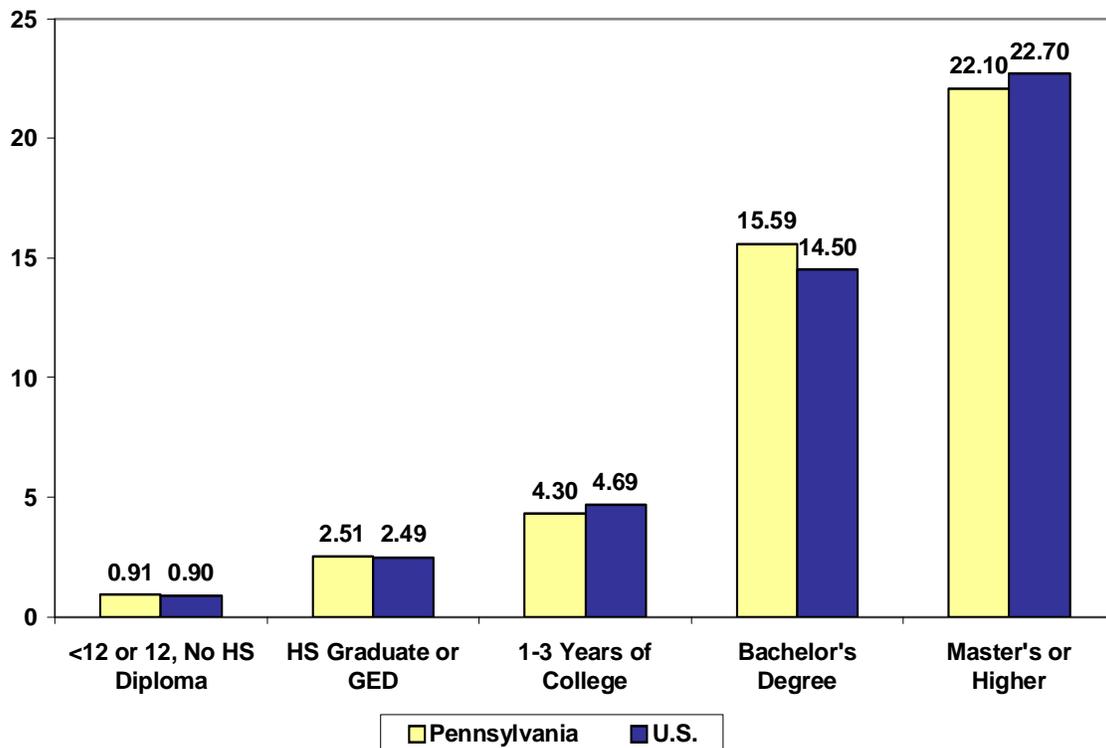
Educational Attainment	Mean Annual Total Tax Payments	Mean Annual Total Transfers and Institutionalization Costs	Annual Net Fiscal Contributions (total tax payments minus total transfers and institutionalization costs)
<b><u>Pennsylvania</u></b>			
<12 or 12, No HS Diploma	\$7,106	\$7,789	\$-683
HS Graduate or GED	10,097	4,030	6,067
1-3 Years of College	12,358	2,873	9,485
Bachelor's Degree	18,124	1,162	16,962
Master's or Higher	29,519	1,336	28,183
All education levels	13,713	3,317	10,396
<b><u>U.S.</u></b>			
<12 or 12, No HS Diploma	\$5,721	\$6,382	\$-661
HS Graduate or GED	9,513	3,824	5,689
1-3 Years of College	12,670	2,704	9,966
Bachelor's Degree	19,797	1,365	18,431
Master's or Higher	28,750	1,266	27,484
All education levels	13,600	3,152	10,448

The net fiscal contributions of adults in each educational group in the nation were quite similar to that of Pennsylvania; negative among high school dropouts (-\$661), and positive for the remaining four educational groups ranging from \$5,869 among high school graduates with no postsecondary education, to \$9,966 among adults with college education below the bachelor's level, to \$18,431 among college graduates with a bachelor's degree and \$27,484 among college graduates with a master's or a higher academic degree.

The net fiscal impact can also be presented as the ratio of mean annual tax payments to the annual mean value of transfers and annual institutionalization costs. We

have computed these net fiscal contribution ratios for each of the five educational subgroups of adults in Pennsylvania and U.S. and presented the findings in Chart 9. In Pennsylvania, the values of these ratios rose sharply with education in Pennsylvania—from 0.91 among adults who did not complete high school, to 15.59 among adults with a bachelor’s degree, and 22.10 among adults with a master’s or a higher academic degree. These ratios reveal that a high school dropout paid only \$0.91 for every \$1 received in the form of transfers and institutionalization costs. In contrast, a Pennsylvania adult who is a high school graduate without any further education contributed \$2.50 in taxes for every \$1 of transfers and institutionalization costs. Those with a bachelor’s degree contributed nearly 16 times more in tax payments than received in transfers and institutionalization costs while their counterparts with a master’s or a higher degree put in \$22 for every \$1 received for transfers and institutionalization costs.

Chart 9:  
The Ratios of Mean Annual Tax Payments to the Combined Value of Cash and In-Kind Transfers and Institutionalization Costs (Net Fiscal Contribution Ratios) of 18-64 Year Old Residents of Pennsylvania and the U.S. by Educational Attainment



Very similar net fiscal contribution ratios were estimated for the five educational groups of adults in the nation. The net fiscal contribution ratios in the nation range from 0.90 among high school dropouts, to 2.49 among high school graduates without any postsecondary education, to 14.50 among college graduates with a bachelor's degree and 22.70 among those with a master's or a higher academic degree.

## **The Mean Lifetime Net Fiscal Contributions of Adults by Educational Attainment**

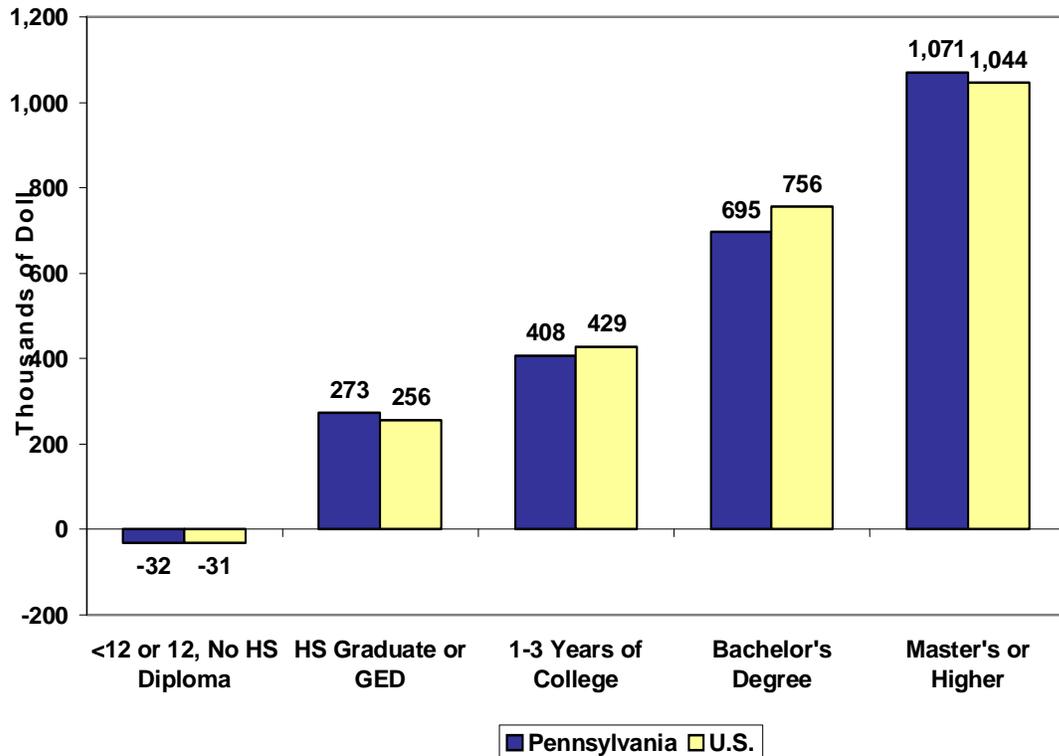
The net fiscal contributions presented in the previous section represent annual amounts of net fiscal impacts. The cumulative amounts of these annual fiscal impacts over the entire work life of each adult Pennsylvanian could be sizable. We have converted the estimates of the mean annual net fiscal contributions of 18-64 year old adults in each educational subgroup into estimates of lifetime net fiscal contributions. Our estimates of lifetime net fiscal contributions are derived by multiplying the annual net fiscal contribution estimates by the total number of years in the work life of each educational group. The work life of each educational subgroup was based on assumptions about the age at which they would begin their work life—which is the age when they are typically earn their educational credentials. We have assumed that a high school graduates would receive a diploma at age 18, a bachelor's degree would be earned at age 22, and a master's degree at age 24. The work life span—the number of years between the age at which they complete their education and age 64 -- was thus computed as 47 year period for high school dropouts, 45 years for high school, 43 years for those with some college, 41 years for Bachelor degree holders, and 38 years for those with a Master's or higher degree.

The lifetime net contributions of adults rose steadily and strongly with their education, especially with the years of postsecondary education. The negative annual net fiscal contribution of adults who failed to complete high school would cumulate into a negative net fiscal contribution of -\$32,000 per adult over their working lives. In contrast, a high school graduate (without any college education) is estimated to contribute a net amount of \$273,000 to the budgets of the federal, state, and local governments. The mean lifetime net fiscal contributions of adults with some college, with a bachelor's degree,

and with a master's or a higher academic degree are estimated, respectively, at \$408,000, \$695,000, and \$1.071 million.

What would be the total impact of assisting a high school dropout to return to school and complete high school? If a resident completes high school and is removed from the dropout category to the high school graduate category, the fiscal impact is twofold: a the removal of the negative net fiscal contribution of the high school dropout and the addition of the positive net fiscal impact of a high school graduate. Each high school dropout in Pennsylvania is estimated to impose a lifetime cost (net fiscal impact) of \$32,000 due to their smaller tax payments higher government transfers and institutionalization costs. Each high school graduate (without any college education) is expected to make a net positive fiscal contribution of \$273,000 over their working lives.

**Chart 10:**  
The Lifetime Net Fiscal Contributions of Adults (18-64) in Pennsylvania and the U.S.  
By Educational Attainment, 2004-2006 Averages (in Thousands of Dollars)



Reducing one high school dropout in Pennsylvania would save the \$32,000 lifetime cost. Converting this high school dropout to a high school graduate would increase Pennsylvania's high school graduates by one and result in a lifetime contribution of \$273,000. The sum of the two (a saving of \$32,000 plus an additional contribution of \$273,000 or \$305,000 represents the potential gain to the federal, state, and local governments for each successful graduation from a Pennsylvania high school of a student who would have otherwise dropped out of high school. Nationwide, the net benefits that accrue from each successful high school graduation of high school dropouts was also quite large, albeit not as large as that in Pennsylvania (\$287,000 in the nation versus \$305,000 in Pennsylvania) due to the slightly smaller negative lifetime contribution of high school dropouts (-\$31,000 in the nation versus -\$32,000 in Pennsylvania) and smaller positive net contributions of high school graduates (\$256,000 in the nation versus \$273,000 in Pennsylvania).

Clearly, working age adults who fail to complete high school impose very high costs upon the public coffers in the form of low tax payments, high rates and amounts of receipt of government transfer costs and high institutionalization costs. These external costs are in addition to the sizable personal costs of dropping of high school that are borne by the individuals themselves. The large gap between the lifetime net fiscal contributions of high school dropouts and their counterparts with just a high school education indicate that the monetary benefit of each successful high school graduation to the public coffers is indeed very large. Although the components in the net fiscal contributions estimated in this report encompass a wide array of taxes and transfers and costs, these estimates are still very conservative since they do not include non-quantifiable personal costs, health costs, and social costs of high school dropouts and the transmission of these costs to future generations through diminished resources available to their children.

## **Appendix A: Estimating the Annual Federal and State Income Taxes Paid by Husbands and Wives in Married Couple Families**

In computing the annual federal and state income tax payments of adults in the March CPS Annual Social and Economic Supplement, the U.S. Census Bureau adopts a different practice for husbands and wives in married couple families than it does for all other individuals with incomes during the year. For married couple families, the U.S. Census Bureau adopts the assumption that the couple files a joint federal and state income tax return. Research staff then estimated the federal and state income tax liability for the married couple and assigned the entire federal and state income tax liability to the head of the married couple family. The householder of this married couple family can be either the husband or the wife. In approximately 85 percent of the cases, the householder in a non-elderly married couple family is the husband.<sup>29</sup> For all other individuals, whether living in families or in non-family households, the federal and state income tax liability appears on their personal record. Given the above practice in assigning income tax liabilities to the head of a married couple family, we cannot identify from the existing March CPS records the specific federal and state income tax liability of the husband and spouse in a married couple family. To avoid exaggerating the income tax payments of the heads of married couple families and severely underestimating the income tax payments of the spouses in such families, we developed a set of computer programming instructions with the SPSS statistical package that allowed us to generate separate estimates of the federal and state income tax liability of husbands and wives.

The procedures used to estimate husband/wife income tax liability can be summarized as follows. We first calculated the percentage shares of joint husband/wife earnings during the year that were earned by the family head and the spouse. The family head's percentage share of earnings (e.g., 70%) was then multiplied by the estimated joint federal income tax liability of the married couple to estimate his (her) federal income tax payments. Suppose that the married couple's federal income tax liability was \$20,000 and the head obtained 70% of the combined earnings during the year. The head's federal

---

<sup>29</sup> Our definition of a non-elderly family is one whose head is an individual under the age of 65.

income tax liability was computed to be  $\$20,000 * .70 = \$14,000$ . The remaining \$6,000 in federal income tax liability was then assigned to the spouse.<sup>30</sup> The same statistical procedures were used to compute the state income tax payments of the husband and wife.

---

<sup>30</sup> In a married couple family, the spouse can be either the husband or wife depending on which of the two was classified as the family householder.

## **Appendix B: Estimating Median and Mean Values of Homes and Annual Property Taxes Paid by Pennsylvania Householders**

The 2006 American Community Survey (ACS) collected data on the characteristics of the homes occupied by responding households, including ownership status, the home's estimated market value, the year when the house was built, and annual property tax payments. Both the data on estimated home prices and property tax payments were collected in a categorical form rather than in continuous form. For example, the respondent was asked to identify the estimated value of their home from 24 pre-assigned categories, ranging from under \$10,000 to over \$1 million. Similarly, the household was asked to choose from over 68 categories the size of their annual property tax payments ranging from \$0 to \$10,000 or more.

Using these categorical data on home price and property tax payments, we calculated mean/median home prices and property tax payments for householders in each of the five educational categories appearing in our analysis. We used the following two formulas to estimate mean and median values of homes and annual property tax payments appearing in our analysis. The mean values of homes and property tax payments are likely somewhat underestimated due to the absence of upper limits for the top category. For example, the property value of homes in the top category was \$1,000,000 or more and for property tax payments it was \$10,000 and over. However, there were very few cases in these upper housing value and property tax categories. The estimated mean and median values of the two variables were calculated as follows:

$$\text{Mean} \cong \frac{\sum_{j=1}^c m_j f_j}{n} \text{-----(1)}$$

Where, c = number of income classes in the frequency distribution

$m_j$  = mid point of home prices or property tax payments in the  $j^{\text{th}}$  class

$f_j$  = frequency of the observations in the  $j^{\text{th}}$  income class

n = number of households who owned their home

$$\text{Median} \cong l + \frac{h}{f} \left( \frac{N}{2} - C \right) \text{-----}(2)$$

Where,  $l$  = lower bound of the response category containing the median value of homes or property taxes (in dollars)

$h$  = width of the median response category (in dollars)

$f$  = frequency of the median category

$N$  = (Total number of sample cases)

$C$  = Cumulative frequency preceding the median category

## Appendix C: Estimating State Sales Tax Payments for Individuals

The U.S. Census Bureau does not provide any estimates of annual state sales tax payments for persons interviewed during the March CPS survey. In our fiscal impact analyses, we have estimated state sales tax payments for individual adults in Pennsylvania by using a combination of personal income data from the 2006 ACS survey and sales tax tables for Pennsylvania published annually by the U.S. Department of Treasury's Internal Revenue Service (IRS). In our analysis of state sales taxes, we applied a single person exemption to each individual respondent ages 18-64 with a positive income. For each person in our analysis, we assigned Pennsylvania state sales tax payment equal to the IRS sales tax deduction for a person in Pennsylvania with their annual income in 2006. Below is a sample table of the allowable sales tax deductions for residents of Pennsylvania in 2006.

Appendix Table C-1:  
Optional State Sales Tax Tables, Pennsylvania, 2006

<b>Income</b>		<b>Exemptions</b>					
At least	But less than	1	2	3	4	5	Over 5
\$0	\$20,000	\$194	\$209	\$219	\$226	\$232	\$239
\$20,000	\$30,000	\$341	\$367	\$384	\$396	\$406	\$419
\$30,000	\$40,000	\$420	\$452	\$473	\$488	\$500	\$516
\$40,000	\$50,000	\$489	\$527	\$551	\$568	\$582	\$601
\$50,000	\$60,000	\$553	\$596	\$623	\$642	\$658	\$679
\$60,000	\$70,000	\$612	\$660	\$689	\$711	\$728	\$752
\$70,000	\$80,000	\$669	\$721	\$753	\$776	\$795	\$821
\$80,000	\$90,000	\$722	\$778	\$812	\$838	\$858	\$886
\$90,000	\$100,000	\$773	\$832	\$870	\$897	\$919	\$948
\$100,000	\$120,000	\$841	\$905	\$946	\$975	\$999	\$1,031
\$120,000	\$140,000	\$935	\$1,007	\$1,051	\$1,084	\$1,111	\$1,146
\$140,000	\$160,000	\$1,018	\$1,096	\$1,145	\$1,181	\$1,210	\$1,248
\$160,000	\$180,000	\$1,102	\$1,187	\$1,239	\$1,278	\$1,309	\$1,351
\$180,000	\$200,000	\$1,179	\$1,269	\$1,326	\$1,367	\$1,400	\$1,445
\$200,000 or More		\$1,572	\$1,691	\$1,766	\$1,821	\$1,865	\$1,924

Source: Internal Revenue Service, "State and Local General Sales Taxes", Publication 600: 2006, [www.irs.gov](http://www.irs.gov).

## **Appendix D: Estimating the Annual Average Costs of Medicaid**

The U.S. Census Bureau collects data on the Medicaid/Medicare recipient status of respondents in a supplement to the March CPS survey. Based on the family's annual income, the cost of its food and housing needs, and the market value of the medical benefits, the Bureau applies a fungible value approach to estimate the family's values of the health services provided by Medicaid.<sup>31</sup> However, for individual member of the households, the Bureau estimated the market value of Medicaid. The actual cost of providing Medicaid services is higher than the U.S. Census Bureau fungible or market value estimates. The actual annual fiscal outlays on Medicaid recipients vary considerably by age group and disability status. For example, for all adults (18-64), the mean value of Medicaid services based on the Census Bureau's market value approach was only \$653. This estimated value of Medicaid services was about 39% lower than the costs we estimated using March CPS and Health and Human Services administrative data on Medicaid expenditures (Appendix Table D-1).

Appendix Table D-2 illustrates the methodology that was used by the Center for Labor Market Studies to estimate the average annual per capita cost of providing Medicaid to non-elderly adults in the U.S. Based on the March CPS supplement data; we first estimated the distribution of adult Medicaid recipients by their disability status. In the U.S. nearly 60% of the Medicaid recipients were classified as disabled adults and the remaining 40% were non-disabled adults (Appendix Table D-2, first row). According to the Medicaid administrative office, the costs of providing Medicaid services for disabled and non-disabled adults in 2006 were \$13,524 and \$2,102, respectively (Appendix Table

---

<sup>31</sup> The U.S. Census Bureau describes fungible value as follows: "The fungible approach for valuing medical coverage assigns income to the extent that having the insurance would free up resources that would have been spent on medical care. The estimated fungible value depends on family income, the cost of food and housing needs, and the market value of the medical benefits. If family income is not sufficient to cover the family's basic food and housing requirements, the fungible value methodology treats Medicare and Medicaid as having no income value. If family income exceeds the cost of food and housing requirements, the fungible value of Medicare and Medicaid is equal to the amount which exceeds the value assigned for food and housing requirements (up to the amount of the market value of an equivalent insurance policy (total cost divided by the number of participants in each risk class))."  
<http://www.census.gov/hhes/income/histinc/redefs.html>

Appendix Table D-1:  
Difference Between the Estimates of CPS Market Value of Medicaid and the CLMS Estimates for All 18-64 Year Old Adults in the U.S., 2004-2006

	(A)	(B)	(C)
Education	CPS Market Value of Medicaid	CLMS Estimates Based on Medicaid Costs of Adults and CPS Data	% Difference (B/A)-1
<12 or 12, No HS Diploma	\$1,663	\$2,118	27%
HS Graduate or GED	\$815	\$1,124	38%
1-3 Years of College	\$487	\$718	47%
Bachelor's Degree	\$189	\$320	70%
Master's or Higher	\$117	\$223	91%
All education levels	\$653	\$907	39%

D-2, second row). We calculated annual average Medicaid costs by multiplying the share of each Medicaid recipient group that was disabled by \$13,524 and the share of adults that were non-disabled by \$2,102 (Appendix Table D-2, third row). The annual average expected cost of Medicaid was estimated to be \$8,101 for disabled adults and only \$843 for non-disabled adults (Appendix Table D-2, fourth row). We then summed the cost of Medicaid for disabled and non-disabled adults to obtain the total average annual cost of

Appendix Table D-2:  
Estimates of the Mean Annual Per Capita Cost of Providing Medical Care to Non-Elderly Medicaid Recipients (18-64 Year Old) in the U.S. in 2004-2006

Variable	Disabled	Non-Disabled
(A) % Distribution of Medicaid Recipients by Disability Status <sup>(i)</sup>	59.9%	40.1%
(B) Annual Average Cost of Providing Medicaid (Administrative Data) <sup>(ii)</sup>	\$13,524	\$2,102
(C) Annual Average Costs of Providing Medicaid (A * B)	\$8,101	\$843
(D) Sum of Costs (Disabled and Non-Disabled)	\$8,944	
(E) % Who Received Medicaid		10.1%
(F) Average Annual Per Capita Cost of Medicaid (D* E)		\$907

Source: (i) March 2005, 2006 and March 2007 CPS surveys, Work Experience and Income Supplement, public use files, tabulations by authors;  
(ii) The Urban Institute and Kaiser Foundation Commission on Medicaid and the Uninsured estimates are based on data from Medicaid Statistical Information System (MSIS) reports from the Centers for Medicare and Medicaid Services (CMS), 2007, web site, <http://www.statehealthfacts.org/comparetable.jsp?ind=183&cat=4>

providing Medicaid for adults (Appendix Table D-2, fifth row). The total cost of providing Medicaid services to U.S. adults was estimated to be \$8,994. Finally, to estimate the taxpayer cost of providing Medicaid coverage to adults in the U.S., we multiplied the average annual cost of providing Medicaid coverage to recipients of Medicaid by the percent of the members of the 18-64 year old adult population that were Medicaid/Medicare recipients (Appendix Table D-2, sixth row). Thus, the mean annual per capita costs of Medicaid for adults (18-64 years old) in the U.S. was \$907. We repeated this process for each of the five educational subgroup of adults used in our analysis (Appendix Table D-1). We then replaced the estimated fungible value of Medicaid on the March CPS survey with this value to estimate taxpayer costs of providing Medicaid.

## **Appendix E: Estimating Jail/Prison Cost of Adults (18-60)**

To estimate rates of institutionalization among the non-elderly adult population of the nation and the state of Pennsylvania in 2006, we analyzed the findings of the 2006 American Community Surveys, which interviewed residents of group quarters for the first time during that year. The ACS survey identified the institutionalization status of each adult respondent. This group includes those persons who were under supervision in correctional facilities (jails/prisons), nursing/skilled nursing facilities, mental (psychiatric) hospitals, in patient hospice facilities, and group homes for juveniles. The public use files for the ACS survey unfortunately do not identify the specific type of institution in which these individuals were living at the time of the survey. Nationally, the U.S Census Bureau's publication of institutionalization data from the 2006 ACS survey revealed that a substantial majority (over 89 percent) of the members of the institutionalized population between the ages of 15 and 64 were inmates of correctional facilities. Since our analysis of the costs of incarceration are restricted to adults under age 60, the share of institutionalized population that was in correctional facilities is expected to be larger than 89 percent since older adults who are institutionalized are more likely to be in nursing homes and less likely to be in correctional facilities.

The U.S. Bureau of Justice Statistics estimated the annual per state prison inmate costs for the entire nation in 2001. Adjusting this per inmate cost for inflation between 2001 and 2006, the cost per inmate for 2006 was derived. By multiplying the institutionalization rate for each educational group of adults from the 2006 American Community Survey by the per inmate cost, we can estimate the average annual costs of institutionalization per adult in each educational attainment group.

Appendix Table E-1:  
Mean Annual Costs of Maintaining 18-60 Year Old  
Pennsylvania Adults in Institutions, 2006

(A) 2006 Institutionalization Rate	1.3%
(B) Cost of Incarceration in 2006	\$36,313
Average Annual Cost of Incarceration (A*B)	\$477

## **Appendix F: The Mean Lifetime Net Fiscal Contributions Adults by Educational Attainment**

The estimates of the mean annual net fiscal contributions of 18-64 year old adults in each educational attainment group can be converted into mean work-life estimates by multiplying them by the number of years over the work-life. For dropouts, we used a 47 year period, for high school graduates 45 years, for those with some college 43 years, for Bachelor degree holders 41 years, and 38 years for those with a Master's or higher degree.<sup>32</sup>

---

<sup>32</sup> We assumed that an average high school graduate would receive a diploma at age 18, a bachelor degree holder would earn the degree at age 22 and a Master's degree holder would earn the degree at 24.