

**The Fiscal Economic Consequences of Dropping Out
of High School: Estimates of the Tax Payments and
Transfers Received by Massachusetts Adults in
Selected Educational Subgroups**

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Introduction

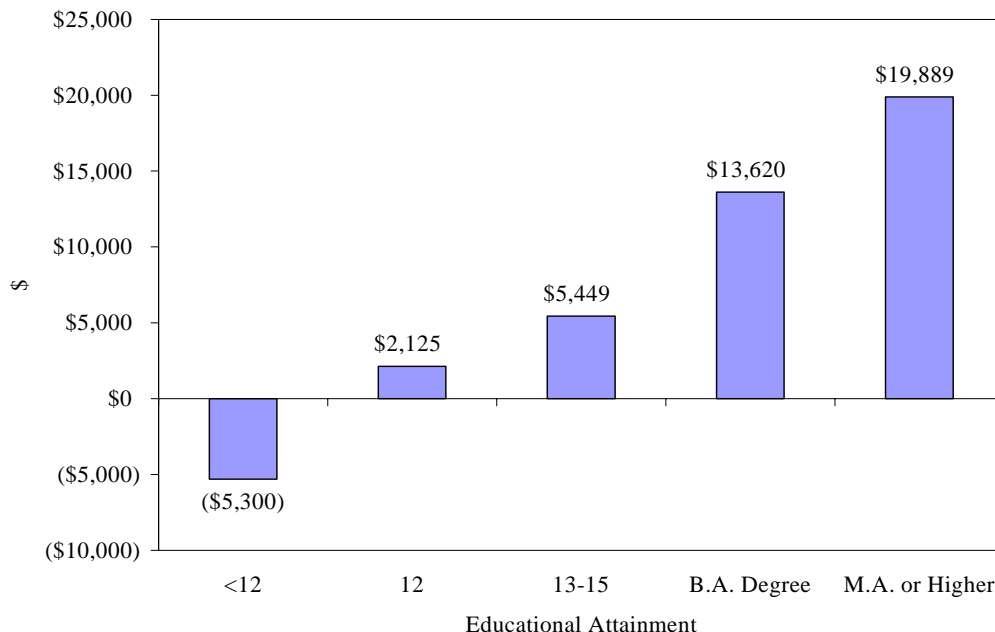
Adults who leave school before graduating from high school with a regular diploma will experience a wide array of adverse labor market, economic, health, and social consequences over their entire lifetime. They will be employed less often, receive lower hourly wages, and earn far less than their better educated peers over their working lives. As a result of their higher levels of joblessness and lower annual incomes, adult dropouts will pay less in payroll and income taxes (state and federal) and receive considerably more cash and in-kind transfer assistance (food stamps, Medicaid health insurance, rental subsidies) from the state and federal government than their better educated peers. The fiscal consequences of dropping out of high school are, thus, likely to be quite substantial, especially in a state like Massachusetts where more dropouts are covered by the Medicaid system, health care costs are higher, and cash transfers are somewhat more generous than in the rest of the nation. The net fiscal impact of a given group of persons (e.g., high school dropouts, high school graduates with no post-secondary education) can be calculated by taking the difference between annual taxes paid and the annual value of cash and in-kind transfers received.

In our recent research report on the economic and social impacts of dropping out of high school in Massachusetts titled, An Assessment of the Labor Market, Income, Health, Social, Civic, and Fiscal Consequences of Dropping Out of High School: Findings for Massachusetts Adults in the 21st Century, we calculated these fiscal impacts for five educational subgroups of adults in Massachusetts.¹ We estimated the average annual value of taxes paid and cash and in-kind transfers received by adults ages 16-64 by their level of educational attainment. In Chart 1, the estimated differences between average taxes paid and transfers received by each educational subgroup are displayed. High school dropouts were the only group of adults in Massachusetts whose transfer costs outweighed the payroll and income taxes that they paid. On average, a high school dropout received \$5,300 more in cash and in-kind transfers from the federal and state government than he or she paid in federal and state income and payroll taxes in 2002 and 2004. In sharp contrast, the average high school graduate with no completed years of post-secondary schooling paid \$2,125 more in taxes than he or she received in transfers, a net fiscal benefit to

¹ Andrew Sum, Ishwar Khatiwada, et.al., An Assessment of the Labor Market, Income, Health, Social, Civic and Fiscal Consequences of Dropping Out of High School: Findings for Massachusetts Adults in the 21st Century, Prepared for Boston Youth Transition Funders Group, Boston, Massachusetts, January 2007.

the government. The fiscal benefits to the state increase substantially for those groups with post-secondary schooling, rising to \$5,450 for those adults completing one to three years of college, \$13,620 for Bachelor degree recipients, and nearly \$20,000 for those with a Master’s or higher degree.

Chart 1:
Mean Annual Taxes Paid- Government Cash and In-Kind Transfers Received by Non-Enrolled
16-64 Year Old Adults in Massachusetts by Educational Attainment, 2002/2004 Averages



The absolute size of the differences between the net fiscal impacts of adult dropouts in our state and those of their better educated peers are quite substantial. On average, during calendar years 2002 and 2004, the average high school graduate in Massachusetts generated \$7,425 more in net federal and state tax revenues than those adults lacking a high school diploma/ GED while the average adult with a Bachelor’s degree generated nearly \$19,000 more in net tax revenues than their peers lacking a high school diploma.² The estimated sizes of these fiscal impacts over the work life (16-64) are quite substantial, even excluding the higher institutionalization costs associated with adults who fail to graduate from high school, especially males who dominate the state’s prison and jail population. The differences between the lifetime fiscal impacts of high school dropouts and graduates will be found to exceed \$450,000 while the

² Net tax revenues represent the difference between the amount of payroll taxes and federal/ state income taxes paid by an individual and the amount of cash and in-kind transfers received by the same individual. The specific types of cash and in-kind benefits will be described below.

difference between high school dropouts and four year college graduates will be found to be over one million dollars.

The net fiscal impacts of adults by educational attainment can also be estimated for the entire nation during the same two calendar years (2002 and 2004). Comparisons of findings for U.S. and Massachusetts adults are presented in Table 1. Overall, due to a combination of a higher relative number of college educated adults, slightly higher annual incomes for college educated adults in our state, and greater reliance on state income taxes, the average net fiscal impact for Massachusetts adults was nearly \$2,100 higher than their U.S. counterparts. However, in Massachusetts, the average adult dropout imposed a much higher tax burden on the rest of the taxpaying public than in the U.S. (-\$5,300 in Massachusetts versus -\$2,100 in the U.S.). Higher costs of in-kind benefits for dropouts in our state, especially subsidized health care, underlie the bulk of this difference. For the other educational groups, the relative sizes of the differences between the fiscal impacts of adults in Massachusetts and the U.S. are much closer. Adults in our state with a Bachelor's or higher degree do generate a larger favorable fiscal impact than their U.S. peers.

Table 1:
Comparisons of the Annual Net Fiscal Impacts of 16-64 Year Old U.S. and Massachusetts
Adults by Educational Attainment, 2002/2004 (Averages in Dollars)

	(A)	(B)	(C)
Educational Attainment	U.S.	MA	MA - U.S.
<12 or 12, no diploma	-\$2,132	-\$5,300	-\$3,168
High school diploma or GED	2,146	2,125	-21
1-3 years of college, including			
Associate degree	4,913	5,449	536
Bachelor's degree	11,044	13,620	2,576
Master's or higher degree	18,021	19,899	1,878
All	5,401	7,489	2,088

Source: March 2003 and March 2005 CPS surveys, Annual Social and Economic Supplement, public use files, tabulations by authors.

An Overview of the Report's Findings

This research paper is designed to achieve a number of objectives related to our larger project which is aimed at identifying the economic, social, and fiscal consequences of dropping out of high school. First, we will describe the sources of data and the calculations underlying the estimates of the fiscal impacts of Massachusetts adults in each of five educational subgroups. Second, we will review each of the individual sources of the tax payments that underlie the estimated annual tax payments of adults, and the estimated mean size of each of these annual tax payments by educational attainment group will be described and compared.

Third, the individual types of cash transfer incomes and in-kind transfers included in our fiscal analysis will be identified, and the estimated mean size of the annual payments received by adults in each educational attainment will be described and compared to one another. Fourth, we will then present our estimated values of the combined annual fiscal impacts for each educational subgroup over the 2002/2004 period in Massachusetts. Fifth, we will supplement these cash and transfer payments with estimates of the annual costs of maintaining adults in jails/prisons across the Commonwealth in recent years. Finally, we will convert these annual fiscal impacts into lifetime fiscal impacts by summing them across the 18-64 lifespan a total of 47 years. The lifetime fiscal consequences of adults dropping out of high school will be assessed.

Data Sources and Calculations That Underlie the Fiscal Impact Estimates

The fiscal impact estimates appearing in this report are based upon several different data sources and a massive series of data calculations by the U.S. Census Bureau and the Center for Labor Market Studies. The primary source of data for the tax and transfer estimates is the Annual Social and Economic Supplement to the March CPS household survey.³ This supplement is used by the U.S. Census Bureau to collect information from sample respondents 15 and older on their work experiences, earnings, incomes, and income sources during the previous calendar year. Information on the receipt of in-kind benefits from the state or federal government, such as food stamps, Medicaid/Medicare benefits, and rental subsidies, is also collected for each sample respondent and household.

³ For details on the design of the March CPS supplement and the definitions for each of the variables, See: www.census.gov/CPS.

Given the information on the annual earnings and incomes, the marital status of respondents, and the type of household in which the respondent lives, 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.⁴ For each sample individuals ages 16-64 who were not enrolled in school, we summed the estimated annual tax payments in the above four tax categories. These combined annual tax payments were estimated for adults in each of the following five educational subgroups:

- Less than 12 or 12 years of school, no high school diploma or GED⁵
- High school diploma or GED, no completed years of post-secondary schooling
- One to three years of college, including Associate degrees
- Bachelor's degree
- Master's or higher degree

The March CPS supplement also collected data from respondents on their receipt of an array of cash income transfers from local, state, or federal government, including unemployment benefits, TANF benefits, SSI and Social Security Disability payments, and general relief. The combined annual income from each of these cash income transfer programs was calculated for each respondent. The questionnaire also collected information on the respondent's receipt of a wide array of in-kind transfers, including food stamps, Medicaid/Medicare health insurance, and rental subsidies. The U.S. Census Bureau imputed cash values for each of these in-kind benefits. We then summed the cash values of each of these in-kind benefits for each respondent and added them to the estimated value of cash income transfers. The difference between the annual tax payments of an individual and the value of the cash and in-kind benefits he received is called the net fiscal impact.

In a final set of calculations we estimate the annual cost of maintaining an incarcerated individual in jail or prison in Massachusetts and multiply these annual costs by the share of male and female adults ages 18-64 in each educational group who were institutionalized at the time of the 2000 Census. The annual cost data for correctional institutions was obtained from the

⁴ For married couples, an assumption is made by the U.S. Census Bureau that the couple files a joint tax return.

⁵ High school students and college students are excluded from the analysis.

Massachusetts Department of Corrections while the estimates of the institutionalization rates were generated from the public use data files for the 2000 Census. The annual average cost of incarceration for each educational subgroup of adults was added to the previous fiscal cost to determine the net fiscal impact including institutionalization costs.

Federal and State Income and Payroll Taxes Paid by 16-64 Year Olds by Level of Educational Attainment

In our fiscal analysis, the total tax benefits to the government include four sources of revenue to government paid by the workers: federal income tax liability, state income tax liability, federal retirement payroll tax deductions, and social security payroll taxes. A set of payroll taxes paid by the employer will be added to the above totals. In Table 2, the sizes of the average annual payments made for each of these four taxes by educational attainment are displayed. High school graduates made approximately double the total tax payments of high school dropouts while Bachelor degree holders paid over five times as much in taxes as dropouts did in 2002 and 2004. The annual gap in total tax payments made by the average high school dropout and average high school graduate was \$2,456.

The four sources of individual tax revenues described above exclude employers' payroll tax contributions. Employers are legally required to pay taxes to state and federal government for unemployment compensation, workers' compensation, Social Security, and Medicare. Given the higher earnings of high school graduates and their higher employment rates, employers will contribute more in payroll taxes for them rather than high school dropouts. We calculated 10% of the annual earnings of high school dropouts and high school graduates and assumed that this would be the average contribution to payroll taxes made by employers.⁶ For bachelor's degree holders, we took 8% of average annual earnings since the Social Security payroll tax phases out when earnings surpass \$80,000. The values of employer contributions by educational subgroup are displayed in Table 2. The annual gap in tax payments between high school graduates and

⁶ In a recent news release from the U.S. Bureau of Labor Statistics, employer costs for Social Security, Medicare, Unemployment Insurance, and Worker's Compensation accounted for 8% of total compensation. To conduct our analysis, we assumed that employers contributed 10% of the average earnings of high school graduates and high school dropouts to this tax. Since most of the taxes phase out as income rises, we estimated that employers contributed 8% of the total compensation paid to employees with bachelor's degrees. See: U.S. Bureau of Labor Statistics, "Employer Costs for Employee Compensation- September 2006," December 13, 2006.

high school dropouts increases to \$3,381 per year when we account for employers' contributions to payroll taxes.

Table 2:
Tax Payments Made by Massachusetts Adults to State and Local Governments By Level of Educational Attainment, 2002/2004

	(A)	(B)	(C)
Tax Income	High School Dropout	High School Graduate	Bachelor's Degree Holder
Federal Income Tax	\$1,136	\$2,233	\$8,400
State Income Tax	531	986	2,709
Federal Retirement Tax	88	169	266
Social Security Retirement Payroll Tax	884	1707	3,329
Total Tax Payments Plus Employers' Payroll Tax Contributions	2,639	5,095	14,704
Total Individual and Employer	\$1,676	\$2,601	\$4,071
	\$4,315	\$7,696	\$18,775

Source: March 2003 and March 2005 CPS surveys, Annual Social and Economic Supplement, public use files, tabulations by authors.

The above gaps in tax revenues paid by each educational subgroup are likely conservative estimates because we exclude property taxes and sales taxes paid. Since high school graduates and college educated adults have higher homeownership rates and own higher value homes, they will pay more in property taxes. Their higher consumption levels for goods subject to the state sales tax will increase their sales tax payments.

Cash Transfers Paid To 16-64 Year Olds by Level of Educational Attainment

High school dropouts also pose an economic burden to local, state, and federal governments because they are more likely to be dependent on the government for cash and in-kind transfers. Cash transfers include unemployment benefits, workers' compensation benefits, Social Security payments, Supplement Security Income (SSI) for the disabled and elderly, public assistance income, veterans' payments, survivor's income and benefits, and other disability income. The average payouts from the government to individuals for each of these cash benefits by level of educational attainment appear in Table 3. The largest cash transfers for high school

dropouts are Social Security Income, Supplemental Social Security income, and disability income, accounting for 90% of the \$3,257 received in cash transfers. The annual gap in total cash transfers paid to the average high school dropout and average high school graduate is \$1,783.

Table 3:
Cash Transfers Received by Massachusetts Adults by Level of Educational Attainment and Type of Transfer, 2002/2004

Type of Cash Transfer	(A)	(B)	(C)
	High School Dropout	High School Graduate	Bachelor's Degree Holder
Unemployment Compensation	\$111	\$272	\$167
Workers' Compensation	108	229	5
Social Security Income	1,188	384	236
Supplemental Social Security Income	1,216	326	62
Public Assistance	70	15	2
Veteran's Payments	6	42	162
Survivor's Income	0	5	11
Disability Income	544	189	42
Energy Assistance	14	12	2
Total	3,257	1,474	688

Source: March 2003 and March 2005 CPS surveys, Annual Social and Economic Supplement, public use files, tabulations by authors.

In-Kind Transfers Paid To 16-64 Year Olds by Level of Educational Attainment

In addition to cash transfers, high school dropouts are much more likely to be dependent on in-kind transfers than their counterparts with a regular high school diploma and additional years of schooling beyond high school. In Table 4, the estimated value of each in-kind transfer is shown by level of educational attainment. The largest in-kind transfers for each of the 3 three educational subgroups were costs associated with the Medicare and Medicaid programs. However, the cost of Medicaid services provided to high school dropouts far exceeded the Medicaid costs for high school graduates (\$3,451 to \$1,083). The average health insurance costs for Bachelor's degree holders were substantially less than high school graduates and dropouts. In addition to large in-kind transfers associated with health insurance programs, high school

dropouts also received substantial housing subsidies. The annual gap in in-kind transfers made to the average high school dropout and average high school graduate was \$3,911.

Table 4:
In-Kind Transfers Received by Massachusetts Adults by Level of Educational Attainment and Type of Transfer

	(A)	(B)	(C)
Type of In-Kind Transfer	High School Dropout	High School Graduate	Bachelor's Degree Holder
EITC	\$126	\$146	\$32
Food Stamp (Market Value)	351	86	14
Medicare (Market Value)	1266	371	178
Medicaid (Market Value)	3451	1083	181
Housing Subsidy (Market Value)	569	167	50
Total	5764	1853	455

Source: March 2003 and March 2005 CPS surveys, Annual Social and Economic Supplement, public use files, tabulations by authors.

Institutionalization Costs of 16-64 Year Olds in Massachusetts by Level of Educational Attainment

The data on institutionalization rates for subgroups of adults available from the 2000 Census can be combined with administrative data on the annual per capita cost of housing and supervising jail and prison inmates to estimate the lifetime institutionalization costs associated with dropping out of high school. According to the Massachusetts Department of Corrections, the annual per inmate cost in state prisons of institutionalization for fiscal year 2006 was \$43,025. By multiplying the institutionalization rate of each educational group of males from the 2000 Census by the per capita institutionalization cost, we can estimate the average annual costs of institutionalization for males and females in each educational attainment group. The average, male high school dropout costs the state of Massachusetts approximately \$1,720 in expenditures related to institutionalization per year (Table 5). The annual costs of institutionalization of male high school dropouts were 2 times as high as those of high school graduates without any postsecondary schooling and nearly 20 times higher than those of four-year college graduates. In Table 6, we conducted the same cost analysis for females in Massachusetts. Although the

average annual expenditures for females are only a small fraction of those of males, female high school dropouts still generated for 3 times the average institutionalization costs of female high school graduates.

Table 5:
Lifetime Per Capita Costs of Institutionalization for Males by
Educational Attainment, Massachusetts, 2005

	(A)	(B)	(C)	(D)
Educational Attainment	Institutionalization Rate (in %)	Per Capita Cost	Average Annual Cost (in \$)	Average Lifetime Cost of Institutionalization (in \$)
1-12 Years, No Diploma or GED	4.0	43,025	1,721	80,887
High School Diploma, No College	1.9	43,025	817	38,399
Bachelor's Degree	0.2	43,025	86	4,042

Table 6:
Lifetime Per Capita Costs of Institutionalization for Females by
Educational Attainment, Massachusetts, 2005

	(A)	(B)	(C)	(D)
Educational Attainment	Institutionalization Rate (in %)	Per Capita Cost	Average Annual Cost (in \$)	Average Lifetime Cost of Institutionalization (in \$)
1-12 Years, No Diploma or GED	0.9	43,025	387	18,200
High School Diploma, No College	0.3	43,025	129	6,067
Bachelor's Degree	0.1	43,025	43	2,022

The average annual institutionalization costs can be summed over the lifetime of an individual from ages 18 to 64 to estimate the lifetime costs of institutionalization. By multiplying the average annual costs by 47 years, which is the number of years between 18 and 64 years of age, we can estimate the average lifetime cost of institutionalizing high school dropouts, high school graduates, and men and women in the other, higher educational subgroups. Column D in Tables 5 and 6 displays the estimates of these lifetime costs by level of educational attainment

for males and females. The average lifetime costs of institutionalization for male high school dropouts was just under \$81,000 versus \$38,000 for high school graduates and only \$4,000 for four year college graduates. The lifetime costs of incarcerating male dropouts will exceed those of high school graduates by \$43,000 and bachelor degree holders by nearly \$77,000. In Table 7, we computed the weighted average costs of institutionalization for males and females by educational subgroup (Column C). The weighted average costs of dropouts exceeded those of high school graduates by nearly \$29,000, a more than two to one difference. The victimization costs will more than double these incarceration costs. These estimated criminal justice system costs are conservative because they do not include either the costs of victimization by those incarcerated or the costs associated with parole and probation once they leave the prison system.

Table 7:
Lifetime Per Capita Costs of Institutionalization for Adults by
Educational Attainment, Massachusetts, 2005

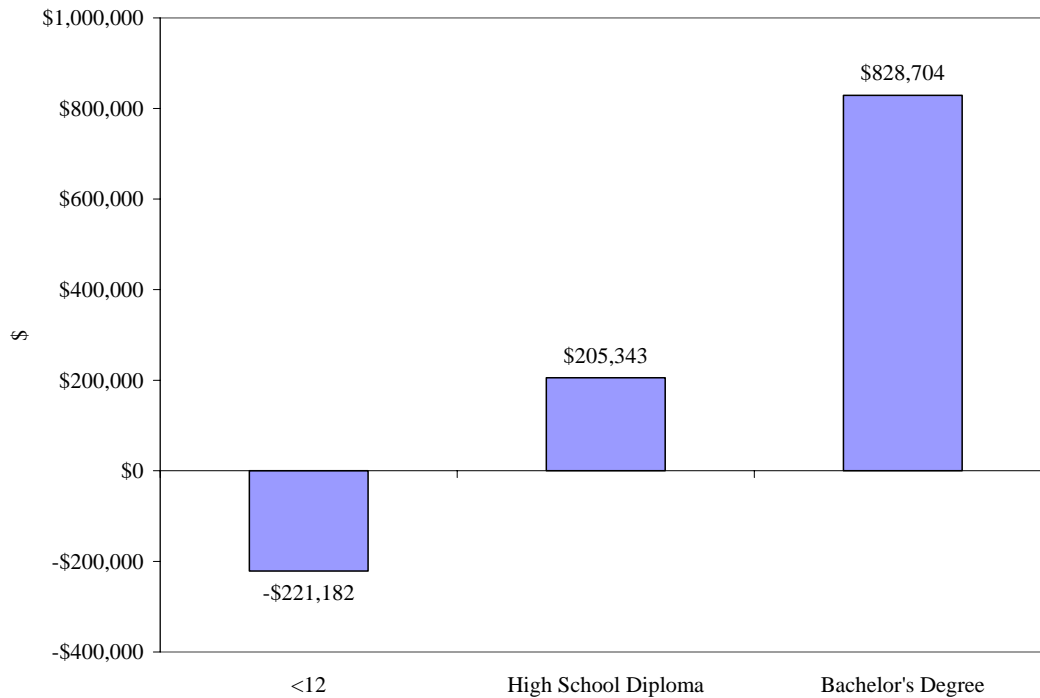
	(A)	(B)	(C)
Educational Attainment	Average Lifetime Cost of Institutionalization of Males (in \$)	Average Lifetime Cost of Institutionalization of Females (in \$)	Weighted Average Lifetime Cost of Institutionalization of Both Males and Females (in \$)
1-12 Years, No Diploma or GED	\$80,887	\$18,200	\$52,678
High School Diploma, No College	38,399	6,067	23,849
Bachelor's Degree	4,042	2,022	3,133

Lifetime Fiscal Impacts of Educational Subgroups in Massachusetts

The annual fiscal impacts can be summed over a lifetime to estimate the lifetime fiscal impacts of each educational subgroup. We took the difference between the total taxes paid in Table 2 and the total cash and in-kind transfers received (Tables 3 and 4) to estimate the average annual fiscal benefit/deficit by educational subgroup. In Chart 2 below, we multiplied these fiscal benefits/deficits by 47 years to estimate the lifetime fiscal impact of these educational subgroups. Over the course of their working years (16-64), high school dropouts, on average, will create a net fiscal burden to government of nearly \$221,000. High school graduates will

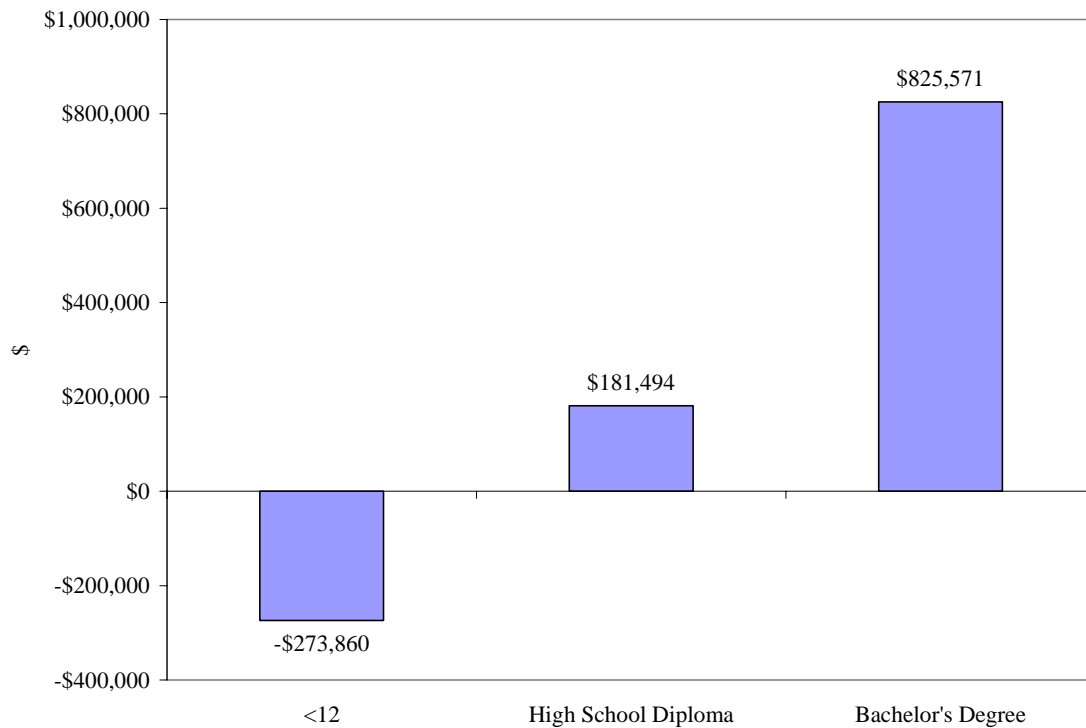
contribute approximately \$205,000 more in individual tax payments and employer contributions than they will receive in transfers from the government during their working years. Those adults in Massachusetts that obtained some post-secondary school, especially a 4-year or higher degree, on average, produce substantial fiscal benefits to government (Chart 2).

Chart 2:
Lifetime Mean Taxes Paid- Transfers Received by Non-Enrolled 16-64 Year Old Adults in Massachusetts by Educational Attainment, 2002-2004 Averages (in \$)



The gap between the lifetime fiscal impacts of high school graduates and high school dropouts exceeds \$425,000 (Chart 2). This gap grows even larger when we include criminal justice costs, such as incarceration, which is much higher among high school dropouts compared to high school graduates (Chart 3). The lifetime fiscal gap between high school dropouts and bachelor degree recipients approaches nearly \$1,000,000 when incarceration costs are factored into the calculations. Clearly, the fiscal costs associated with dropping out of high school are very substantial for Massachusetts taxpayers. Reducing the size of the dropout problem in the state would produce more citizens that produce positive net fiscal impacts.

Chart 3:
Lifetime Mean Taxes Paid- Transfers Received Plus Institutionalization Costs of Non-Enrolled
16-64 Year Old Adults in Massachusetts by Educational Attainment, 2002-2004 Averages (in \$)



When we include the estimated institutionalization costs of each group, the lifetime fiscal gap between high school graduates and high school dropouts increased to \$455,354. A high school dropout costs the government about \$275,000 over the course of their working lives whereas a average high school graduate produces a net benefit to government of approximately \$180,000. The lifetime fiscal gap between bachelor degree recipients and high school dropouts exceeds \$1.1 million (Chart 4).

Chart 4:
The Estimated Lifetime Fiscal Impact Gaps Between Selected Educational Subgroups of Adults
in Massachusetts (in \$)

