

The Long Term Labor Market Consequences of Dropping Out of High School in Pennsylvania

Prepared for:
Pennsylvania Department of Labor & Industry

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Introduction

The teenage and young adult years are critical times in the lives of individuals as these ‘not quite adults’ transition from dependence upon decisions made by parents or guardians to a stage where the teen or young adult begins to independently make decisions about their physical, intellectual and emotional well being and become increasingly responsible for the choices they have made. Young people today are confronted with a number of key choices that can have very powerful impacts on the quality (and even the quantity) of their futures. Every day, sometimes seemingly routine decisions that confront high school students, like course selections or even choosing to attend school regularly, can exert substantial influence on student’s lifetime employment and earnings outcomes. Less incremental choices that can lead to very different life pathways also await those entering the teen and young adult years. Family formation, post secondary education access and completion, the decisions to work and career choice are among the many decisions that teens and young adults must make—either by commission or omission. In this increasingly unforgiving economic environment decisions in all these arenas (and many others as well) must be made at comparatively young ages by all but the most affluent young people.

Frequently, both students and others simply do not think much about the future and instead simply consider the here and now. But efforts to ignore the future and the long run implications of the choices that young people make today come at a high price. The decisions made by today’s young people will shape their future lives in very powerful ways. Today’s labor market is much less forgiving than the labor market environment that existed in even the recent past. As the role of basic skills, occupational proficiency, and work experience become increasingly important in influencing long term job market outcomes, decision-making by teens and young adults, takes on more of the characteristics of long term investment decision-making instead of short-term consumption decision-making.

Investors put their resources in developing long term capacity to become more productive so they can compete more effectively in the global market. This of course makes them risk takers, and as such they spend a considerable amount of time becoming

informed about the alternative consequences of their investment choices. Why do investors take this risk? Because they understand that in the long run, expanding productivity in producing products and services with high demand yields greater rewards. Investor's seek to minimize their risks by becoming better informed about the likely long run implications of the choices that they make in the here and now. So it is with teens and young adults.

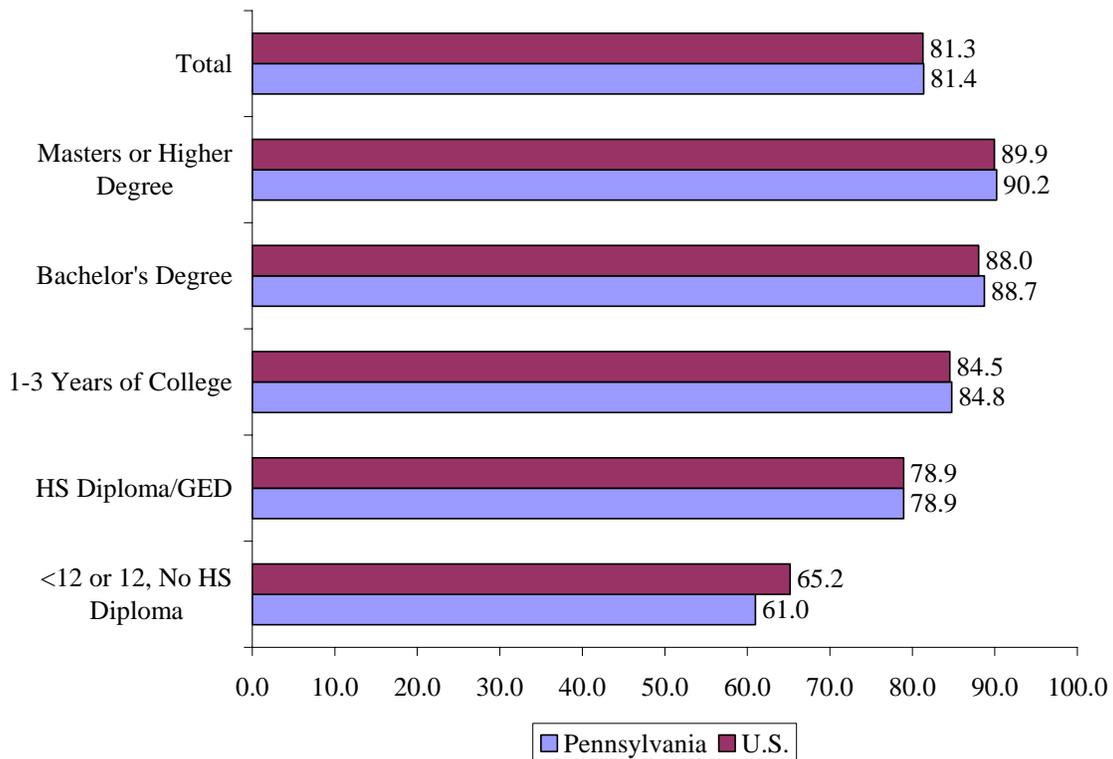
During the teen and young adult years, individuals make important decisions about how they will add to their 'productive capacity' or what economists call human capital. Decisions about school, work, health, and family will collectively determine the level of literacy skills, occupational skills and work experiences that these young people will bring to the labor market during their future working lives. It is the individuals' stock of skills that are at the heart of human capital and the quantity and quality of these skills that individuals develop when they are young will exert an extraordinary powerful influence on their life path. Those who fail to develop their human capital potential will find themselves left increasingly behind as those teens and young adults who invest their time and energy wisely find increased opportunity to learn, earn and prosper. Those who make poor choices will find themselves left behind in an increasingly competitive and more unforgiving labor market environment.

This brief examines the impact of dropping out of high school on the expected life time earnings of young people in the state of Pennsylvania. The findings presented below are based on our analysis of the American Community Survey (ACS) responses from Pennsylvania households during 2006. The ACS is a very large annual survey of households conducted by the U.S. Bureau of the Census. The data provided in this report are based on responses from more than 86,000 Pennsylvania households that were surveyed during 2006. The ACS questionnaire includes a variety of questions about the demographic, socio-economic and educational activities and experiences of respondents. The Center for Labor Market Studies used the public use micro data files derived from the ACS to produce the estimates of key labor market outcomes for the 18 to 64 year old population in the Commonwealth of Pennsylvania and the nation as a whole (excluding those aged 18 to 22 who were enrolled in school during 2006) that are provided in this brief

Work Activities by Educational Attainment

Employment is, of course, a fundamental outcome of human capital investments. A large portion of the economic gains to investments in education, training and other human resource development activities occur because of the advantages they provide in the labor market. Among the most basic advantages that these investments provide is access to work. The data provided in Chart 1 examine the expected rates of work of those in their late teens through the pre-retirement years in both the state and the nation, by their level of educational attainment. The specific measures we employ examines whether or not individuals reported any work activity over the prior twelve month period. Work or employment is defined simply as those who worked for one hour or more for pay or profit during any week during the year, including the self-employed or who worked in unpaid family enterprises of various types.

Chart 1
Expected Mean Annual Incidence of Work over the Year of the 18 to 64 Year Old
Population of Pennsylvania and the U.S., By Level of Educational Attainment, 2006
(Excluding 18 to 22 Year Old Students)



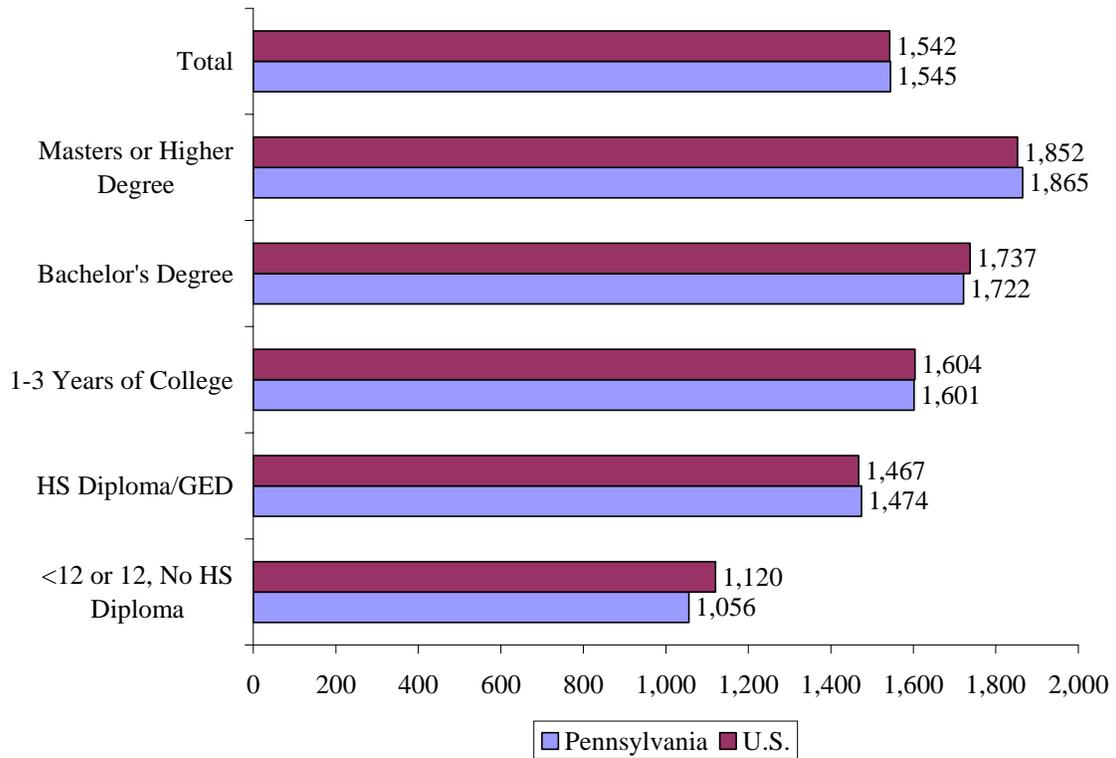
In both the state and the nation, the ACS survey found that the expected work rate was 81 percent of 18 to 64 year old population group. However, the extent of access to any employment at all over an entire 12 month period varied considerably by level of educational attainment. Close to 90 percent of those who had very high levels of educational attainment, a bachelor's degree or higher, had some work activity during the previous year. High school graduates with no college were considerably less likely to work with just under 80 percent of this groups reporting that they had worked at any time over the year. High school dropouts were the least likely to have worked at all during the prior 12 months. In Pennsylvania, about 40 percent of all dropouts (aged 18 to 64) did not work at all during the prior year. High school graduates in Pennsylvania with no college were 30 percent more likely to report any work during the year compared to dropouts. College graduates were about 50 percent more likely to report that they worked at some point in the previous 12 month period compared to dropouts.

Access to employment clearly has a close connection to the level of educational attainment that individuals achieved over the course of their lives. Getting access to employment is only the beginning of generating strong career earnings. Jobs that are full-time and year round provide workers with the opportunity to supply more hours of work over the course of the year and thereby raise the annual earnings levels. The problem of access to employment among high school dropouts is further compounded by their limited access to more intensive employment. Access to intensive employment, defined as employment that provides more weeks of work and weekly hours of work, is also connected to the level of educational attainment achieved by individuals.

Chart 2 examines the expected mean annual lifetime hours of work of persons aged 18 to 64 in Pennsylvania and the nation as a whole. The data reveal a strong positive connection between educational attainment and hours of work. College graduates with advanced degrees in Pennsylvania can expect to work an average of about 1850 hours per year—a level of work equivalent to full-time year round employment, assuming 35 hours per week for 52 weeks per year. High school graduates in the Commonwealth can expect to work about 1,475 hours per year on average over their working lives. Advanced degree holders in Pennsylvania have the opportunity to work about 20 percent more hours over the course of a year compared to high school graduates with no college. Those with a

bachelor’s degree can expect to work about 16 percent more hours per year over their working lives compared to high school graduates in the state.

Chart 2:
Expected Mean Annual Hours of Work of the 18 to 64 Year Old Population of
Pennsylvania and the U.S., 2006, By Level of Educational Attainment (Excluding 18 to
22 Year Old Students)



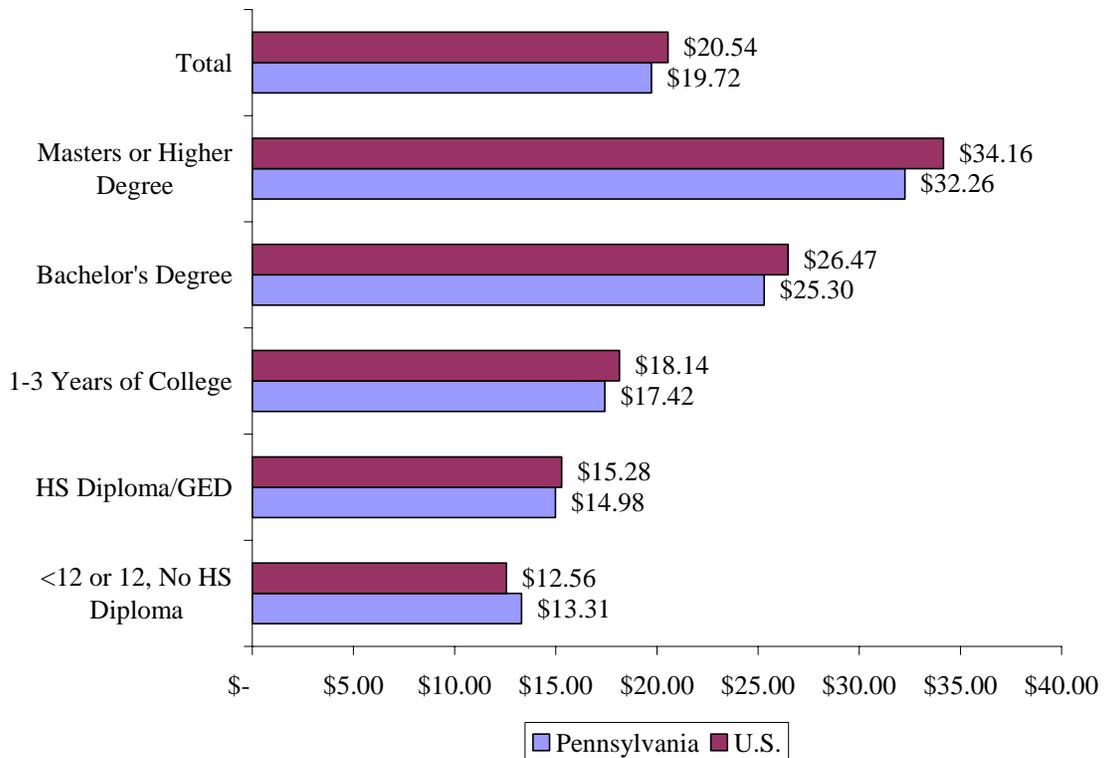
High school dropouts in Pennsylvania can expect to work, on average, about 1,150 hours per year over their working lives, a level of work intensity well below that of other residents with more years of schooling. Pennsylvania dropouts work about 38 percent fewer hours in any given year than a college graduate resident with only a bachelor’s degree and more than one quarter fewer hours than high school graduate residents of the state. High school dropouts in Pennsylvania also work fewer hours than do dropout residents in other states. Dropouts in the nation as a whole can expect to work about 1,120 hours per year over their working lives. In Pennsylvania, dropouts can expect to work 64 fewer hours or about 6 percent less per year. Over a working life of 47 years this translates into the equivalent of working about 2.8 fewer years of work for

Pennsylvania resident dropouts compared to their counterparts who reside in other states in the nation.

Earnings by Educational Attainment

A third key factor influencing the earnings of individuals over their working lives is the hourly wage that they can expect to earn on average over their working lives. The expected hourly pay that workers earn over their working lives will also be heavily influenced by the degree to which human capital is acquired over time, including knowledge, skills, and abilities and other traits that improve the productive capacity of individuals that are derived from more years of schooling. The findings provided in Chart 3 reveal wide variability in the expected annual hourly earnings of employed persons in both Pennsylvania and the nation.

Chart 3:
Expected Mean Annual Hourly Pay of the 18 to 64 Year Old Population of Pennsylvania and the U.S., By Level of Educational Attainment, 2006 (Excluding 18 to 22 Year Old Students)



Expected mean hourly pay for employed college graduates, with a bachelor's degree only, over their working lives is \$25.30 in Pennsylvania. Among the employed population without a high school diploma or a GED certificate, the expected hour pay averages \$13.31 over their working lifetime. Employed college graduates with no advanced degree can expect to earn about 90 percent more per hour than dropouts. High school graduates in the state have mean expected lifetime hourly wages of \$14.98, an rate of hourly pay that was only modestly higher (12 percent higher) than high school dropouts.

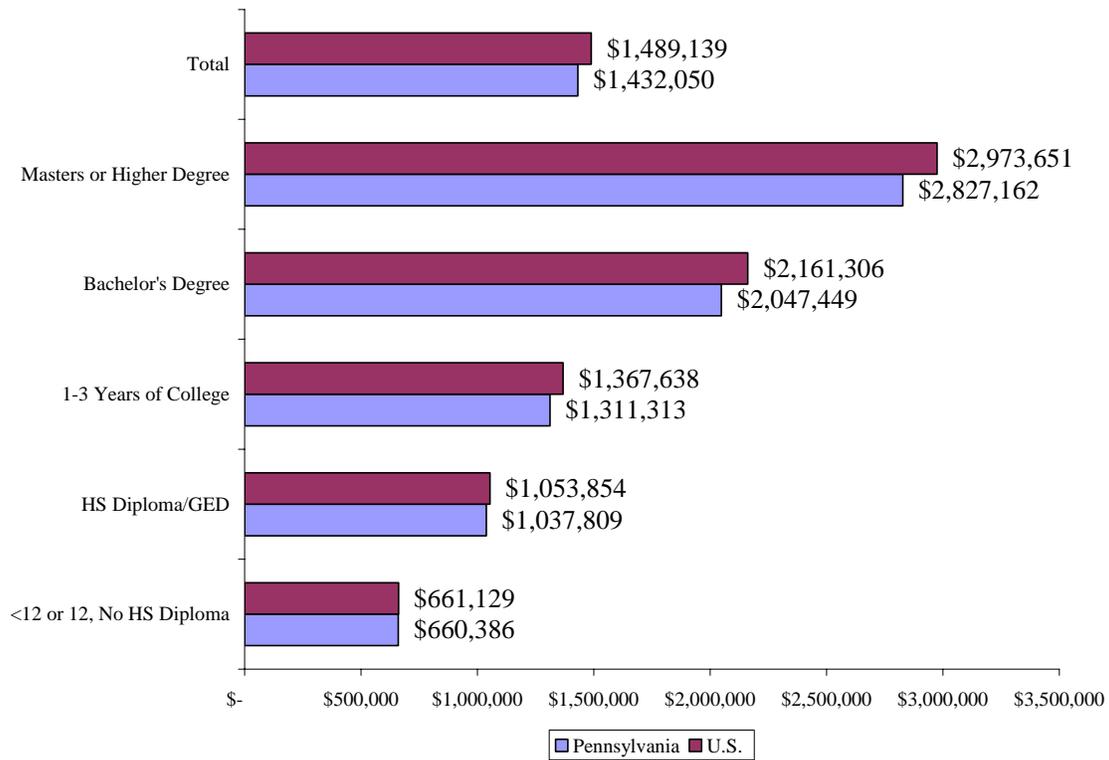
The relatively small difference in hourly pay between high school dropouts and high school graduates does not translate into small differences in expected lifetime earnings between these two population groups. The lifetime earnings of working age adults in Pennsylvania is determined by the access to employment, the number of hours individuals are able to work over the course of a year, the hourly wage workers earn when employed, and the number of years they are expected to work.¹ The findings in Chart 4 put all four of these factors together to estimate the expected lifetime earnings of Pennsylvania residents by level of educational attainment.

The data reveal enormous disparities in expected lifetime earnings in the Commonwealth by level of education. The earnings advantages to staying in high school are overwhelmingly large. Expected lifetime earnings for high school dropouts are only about \$660,000. High school graduates who have no college at all can expect to earn \$377,000 more in their lifetime compared to a high school dropout. Completing additional post secondary schooling raises the earnings of high school graduates in the state by an additional \$273,000. Those who complete high school and have some college below the bachelors degree level can expect to earn almost double the earnings of a high school dropout over their working lives. Pennsylvania residents who finish high school and go on to complete a four year college degree can expect to earn over \$2 million per year, a lifetime earnings level that is nearly double that of high school graduates and more than 3 times greater than the expected lifetime earnings of high school dropout residents of Pennsylvania. Commonwealth residents who continue their

¹ We make the very conservative assumption that all persons could work from the age of 18 through the age of 64.

education beyond the bachelor’s degree level and earn graduate and professional degrees have expected lifetime earnings of more than \$2.8 million. These persons will earn more than four times the lifetime earnings of dropouts in the state.

Chart 4:
Expected Lifetime Earnings of the 18 to 64 Year Old Population of Pennsylvania and the U.S., By Level of Educational Attainment, 2006 (Excluding 18 to 22 Year Old Students)



Higher levels of educational attainment are related to much greater employment access, a greater number of hours of labor supply in the job market, and higher hourly rate of pay. Together, these factors create extraordinarily large differences in expected lifetime earnings between educational subgroups of the population that are described above. Yet, while education has had strong labor market payoffs for a number of years, the earnings advantages of those with more schooling have grown over time. The findings in Table 1 examine trends in the expected lifetime earnings of persons aged 18 to 64 in Pennsylvania between 1979 and 2006.

Table 1:

Trends in the Expected Lifetime Earnings of the 18 to 64 Year Old Population of Pennsylvania, by Level of Educational Attainment, 2006 (Excluding 18 to 22 Year Old Students)

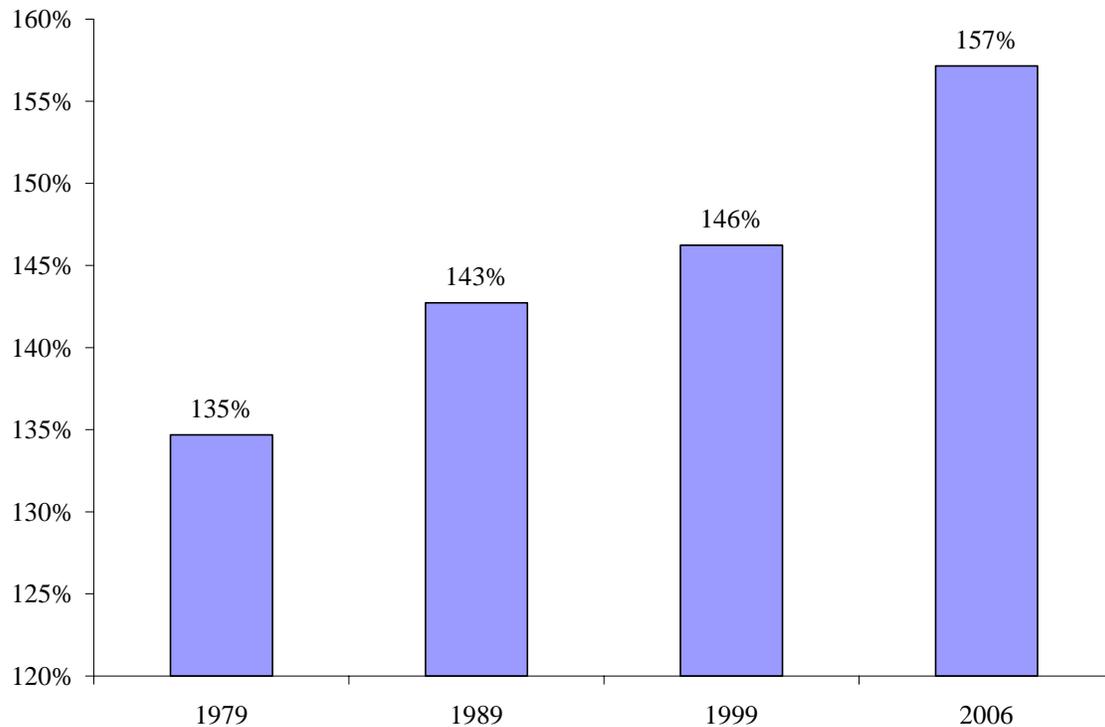
	1979	1989	1999	2006	Absolute Change	Relative Change
<12 or 12, No HS Diploma	\$821,787	\$759,676	\$753,705	\$660,386	\$-161,401	-19.6%
HS Diploma or GED	\$1,106,794	\$1,084,217	\$1,102,202	\$1,037,809	\$-68,986	-6.2%
1-3 Years of College	\$1,379,174	\$1,463,661	\$1,428,562	\$1,311,313	\$-67,861	-4.9%
Bachelor's Degree	\$1,981,180	\$2,215,099	\$2,178,683	\$2,047,449	\$66,269	3.3%
Masters or Higher Degree	\$2,533,395	\$2,786,751	\$2,889,288	\$2,827,162	\$293,767	11.6%
Total	\$1,217,883	\$1,354,968	\$1,469,064	\$1,432,050	\$214,167	17.6%

During the past approximately quarter century, the expected lifetime earnings of adults in Pennsylvania rose by \$214,000 or by nearly 18 percent. However, a closer look at the table reveals that no individual group in the state experienced an expected lifetime gain in earnings that was equal to or that exceeded the increase that occurred over all in the state. Indeed, the data reveal that a number of groups experienced considerable decline in their expected lifetime earnings. As we will discuss in greater detail in a subsequent brief, all of the net increase in expected lifetime earnings that has occurred in Pennsylvania is the product of rising levels of educational attainment of the adult population. Over time the fraction of adults with higher levels of educational attainment has increased, providing them with access to employment opportunities that provide better earnings opportunities. Those who failed to make additional investments in educational attainment found themselves increasingly left behind in the 'new' Commonwealth economy.

Dropouts during saw their expected earnings decline from just under \$822,000 during 1979 to just \$660,386 by 2006, a decline in lifetime earning of more than \$161,000 or nearly 20 percent. High school graduates with no college saw their expected lifetime earnings fall as well, but at a much lower rate than that experienced by dropouts.

High school graduates have experienced a \$69,000 lifetime earnings decline since 1979 representing a relative loss of 6.2 percent.

Chart 5:
Trends in the Relative Size of the Advantage in Expected Lifetime Earnings of High School Graduates (only) Compared to High School Dropouts in Pennsylvania, 1979 to 2006 (Excluding 18 to 22 Year Old Students)

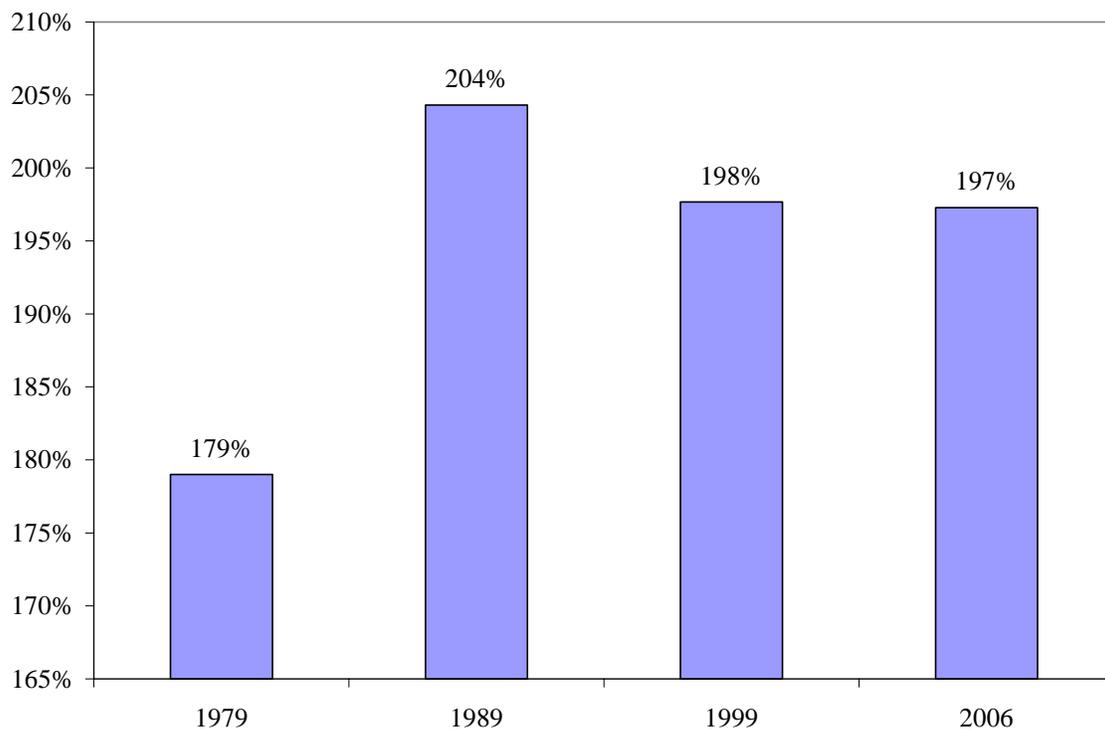


The much larger absolute and relative decline in the lifetime earnings of high dropouts compared to high school graduates (with no college) has meant that the relative lifetime earnings gap between dropouts and graduates in Pennsylvania has widened considerably since the end of the 1970s. During 1979, high school graduates with no post secondary schooling could expect to earn about 35 percent more over their working lives than those who had dropped out of high school. Over the next 27 years the expected lifetime earnings of dropouts in the state declined by at a rate that was 3 times greater than the expected lifetime earnings decline of high school graduates (19.6 percent versus 6.2 percent). By 2006 high school graduates had expected lifetime earnings that were 57 percent greater than those of high school dropouts. The last quarter century has seen

extraordinary losses in the absolute and relative position of high school dropouts in the Pennsylvania labor market.

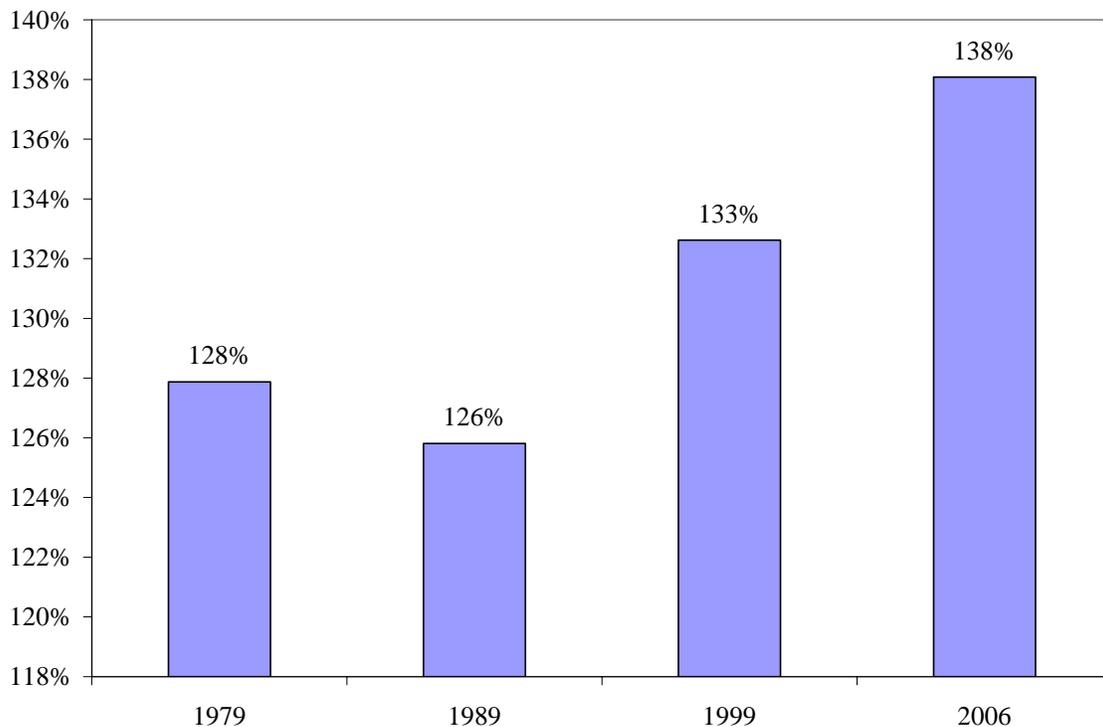
The absolute and relative expected lifetime earnings advantage associated with completing a bachelor's degree program has increased since 1979, even as the position of dropouts and to a lesser extent high school graduates has deteriorated. By the end of the decade of the 1970s the expected lifetime earnings advantage of those with a bachelor's degree was quite large compared to those with only a high school diploma. During 1979, the mean expected lifetime earnings of those who had been awarded a bachelor's degree were 79 percent higher than the mean expected lifetime earnings of those with only a high school diploma. By 1989 this advantage had increased to more than 204 percent, as the expected lifetime earnings of those with a bachelor's degree increased sharply over the decade of the 1980s. Since the recession of early 1990s, the expected lifetime

Chart 6:
Trends in the Relative Size of the Advantage in Expected Life Time Earnings of Bachelor's Degree Recipients (only) Compared to High School Graduates (only) in Pennsylvania, 1979 to 2006 (Excluding 18 to 22 Year Old Students)



earnings of those with a bachelor's degree have declined slightly. Nonetheless, the expected lifetime earnings of those with bachelor's degree were nearly double that of those with only a high school diploma. Pennsylvania residents who have been awarded a graduate or professional degree beyond the bachelor's degree level have experienced the largest absolute and relative increases in expected lifetime earnings among the overall adult population in the state since 1979.

Chart 7:
Trends in the Relative Size of the Advantage in Expected Life Time Earnings of Graduate and Professional Degree Recipients Compared to Bachelor's Degree Recipients (only) in Pennsylvania, 1979 to 2006 (Excluding 18 to 22 Year Old Students)



During the 1980s the expected lifetime earnings of those with advanced degrees increased by about 9 percent, while those with a bachelor's degree experienced an 18 percent rise in expected lifetime earnings. The result is that during the 1980s the expected earnings advantage of advanced degrees declined slightly. During 1979 those with an advanced degree had a mean expected lifetime earnings advantage of 28 percent, but this premium fell to 26 percent by 1989. However, between 1989 and 2006 the expected lifetime earnings of those with a bachelor's degree only had declined (especially in recent

years) as that of persons with advanced degrees rose. This has meant that by 2006 persons with graduate or professional degrees could expect to earn 38 percent more over their working lives relative to those individuals who had earned only a bachelor’s degree.

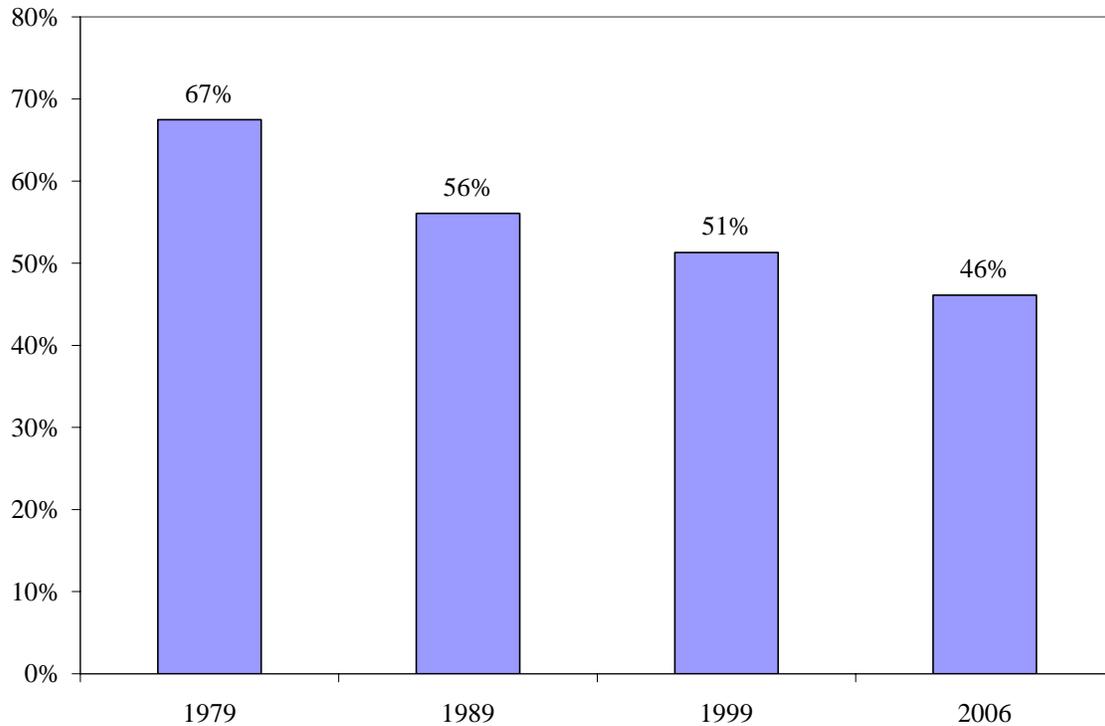
Both the absolute and the relative labor market position of high school dropouts in Pennsylvania have deteriorated considerably since 1979. The findings in Table 2 examine the ratio of the expected mean lifetime earnings of high school dropouts to the expected mean lifetime earnings of residents with higher levels of educational attainment in Pennsylvania between 1979 and 2006. The data reveal that the relative earnings position of high school dropouts has deteriorated over the past 27 years when compared with other groups in the state population. During 1979, expected lifetime earnings of dropouts in Pennsylvania were equivalent to about three quarters of that of high school graduates, but by 2006 the expected earnings of dropouts had fallen to under two thirds that of those with just a high school diploma. Dropouts expected lifetime earnings were much below those of college graduates in 1979. Dropouts could expect to earn on average an amount equal to only 41 percent of the earnings of an adult with a bachelor’s degree. By 2006 this ratio had deteriorated such that dropouts now can only expect to earn about one third of the expected earnings of a person with a bachelor’s degree. At the end of the 1970s dropouts could expect lifetime earnings that were about one third those of persons with an advanced degree, but by 2006 dropout earnings in Pennsylvania were equal to only one quarter the expected lifetime earnings of those with an advanced degree.

Table 2:
Trends in the Ratio of Mean Expected Lifetime Earnings Earning of the 18 to 64 Year Old Civilian High School Dropout Population in Pennsylvania Relative to Those with Higher Levels of Educational Attainment. (Excluding 18 to 22 Year Old Students)

	1979	1989	1999	2006
HSDO/High School Grad	74%	70%	68%	64%
HSDO/Bachelor's Only	41%	34%	35%	32%
HSDO/ Advanced Degree	32%	27%	26%	23%

Over time Pennsylvania’s high school dropouts have found that their expected lifetime earnings have steadily fallen behind those of other groups in the state. Moreover, the relative size of their declining earnings experiences has been considerable. During

Chart 8:
Trends in the Relative Size of the Advantage in Expected Lifetime Earnings of high School Dropouts Compared to the Expected Lifetime Earnings of All Persons Aged 18 to 64 in Pennsylvania, 1979 to 2006 (Excluding 18 to 22 Year Old Students)



1979 high school dropouts had earnings that were equal to 67 percent of the expected mean lifetime earnings of all workers in the state. By 2006, expected dropout earnings had fallen to a level equal to just 46 percent of the state average. This loss occurred because of both a sharp deterioration in the labor market experiences of dropouts and a rise in the level of educational attainment of adults in Pennsylvania since 1979.

Key Findings

Dropouts in Pennsylvania are much less likely to work at all during their working lives. The expected proportion of dropouts who are employed at any point during a given year is about one quarter below that of all workers. Dropouts in Pennsylvania also work fewer hours compared to the hours of work of their better educated counterparts. The expected annual hours of employment of dropouts in the state is just 1,056, about one third fewer hours of work compared to the expected hours of work of all persons aged 18

to 64 in the state. Among employed dropouts in Pennsylvania, the expected hourly wage was \$13.31 during 2006 equivalent to just two thirds the expected hourly wages of all employed adults in the state.

The labor market consequences of dropping out of high school for young people today means reduced job access over their working lives, much reduced opportunity to supply hours of work over the course of a year, especially in full-time jobs that are more likely to offer non wage fringe benefits including health and pension benefits, and a lower hourly rate of pay. Moreover, as the findings in Chart 8 indicate, the labor market outcomes for high school dropouts have deteriorated considerably over time. Part of the explanation for the very poor labor market outcomes for high school dropouts is a consequence of the changing nature of labor demand in Pennsylvania.

The job content of the Pennsylvania economy has changed over time such that the relative rewards to higher levels of educational attainment have increased sharply. Sharp declines in manufacturing payroll employment levels and reconfiguration of staffing structures within the manufacturing industry have sharply limited employment opportunities for high school dropouts in this sector which has been a traditional source of full-time, year round employment. Manufacturing producers now employ workers with considerably higher levels of educational attainment than was the case in the past.

Much of the employment growth that has occurred in Pennsylvania over the past quarter century has been concentrated in service producing industries. These industries employ relatively high shares of workers with post secondary levels of educational attainment and relatively low shares of high school dropouts. In recent years, much of the state's net employment gains have been concentrated in professional and business services and education and health services, both industry sectors that utilize those with post secondary education in their staffing structures at very high rates.

The changing industrial composition of employment combined with technological and organizational changes within industries that have shifted staffing patterns toward more skilled, better educated workers have both meant that the labor market demand for high school dropouts has fallen considerably. Instead, the structure of labor demand has shifted to favoring those with higher levels of educational attainment thus leaving high school dropouts increasingly behind in the 'new' Pennsylvania economy.