

# **INVESTMENT IN EDUCATION: PRIVATE AND PUBLIC RETURNS**



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## **ABSTRACT**

There is a strong consensus among economists that formal education is an important determinant of individual earnings as well as economic growth. The importance of formal education has been magnified by recent economic trends underlying U.S. labor market demand for skilled workers. The following is an analysis of the importance of education to both the individuals acquiring education and of the benefits received by society resulting from increased educational attainment.

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# **INVESTMENT IN EDUCATION: PRIVATE AND PUBLIC RETURNS**

## **EXECUTIVE SUMMARY**

This analysis examines the concept of human capital and concludes that increased levels of education benefit both individuals and society. Increasing the years of schooling, training, and experience of workers has a significant effect on the earnings of the individuals and society at large.

This paper documents the extensive benefits associated with increased levels of human capital. Specifically, the report finds the following private effects:

- The rate of return on an additional year of schooling is quite substantial. In 1990, this rate averaged almost 10 percent per annum.
- In 1998, the median income of bachelor degree recipients was \$46,285, nearly \$20,000 higher than the median income for workers with only high school diplomas.
- Increased educational attainment increases the probability that an individual will remain in the labor force. Among male workers in their 30's, 2.4 percent of college graduates were out of the labor force, compared to 7.9 percent for high school graduates.
- Individuals with more human capital tend to be very efficient at their employment search, increasing their likelihood of remaining with the same firm. Workers with higher education and training are less likely to experience involuntary job changes.
- The return on a college diploma varies from one concentration area to another. For example, the recent median starting salary of a college graduate with a degree in computer science or engineering was \$32,802, or was 36 percent higher than the median starting salary of all college graduates.
- There is a positive relationship between increased education and good health.

In addition, a review of the human capital literature suggests that increasing human capital benefits society as a whole.

- Human capital formation has a positive effect on economic growth. The contribution of increased educational levels to U.S. economic growth has been estimated to be as high as 25 percent.
- If education levels had stagnated at 1959 levels, and everything else had remained the same, GDP in 1997 would be 82.6 percent of its current level in real terms.
- More education is associated with a reduced dependence on income transfers.
- Where the population is better educated there are, on average, fewer crimes.
- A positive association exists between increased education and reduction in out-of-wedlock childbirth.

# INVESTMENT IN EDUCATION: PRIVATE AND PUBLIC RETURNS

## I. INTRODUCTION

Human capital, a concept introduced by Nobel Laureate Theodore W. Schultz and elaborated on by Nobel Laureate Gary Becker, is the notion that individuals acquire skills and knowledge to increase their value in labor markets.<sup>1</sup> Experience, training, and education are the three main mechanisms for acquiring human capital, with education being primary for most individuals. Education facilitates the acquisition of new skills and knowledge that increase productivity. This increase in productivity frees up resources to create new technologies, new businesses, and new wealth, eventually resulting in increased economic growth. Education is a “public good” in that society benefits from increased education as well as the individual.

This paper reviews the evidence concerning the financial returns to education and examines some of the non-market effects of education. In particular, this paper examines the effects that increased educational attainment has had on the earnings of workers and on economic growth in the United States. Using government data and empirical research, this study shows that the returns to individuals and society from education are substantial.

## II. PRIVATE RETURNS TO EDUCATION

### EARNINGS

The amount of education acquired by workers has an important impact on labor market experience. The most direct way that education affects the labor market experience of workers is by increasing their productivity, thus increasing their earnings. The more education individuals acquire, the better they are able to absorb new information, acquire new skills, and familiarize themselves with new technologies.<sup>2</sup> By increasing their human capital, workers enhance the productivity of their labor and of the other capital they use at work.

If higher levels of productivity reflect higher levels of human capital, which are in turn primarily a result of increased education, then a positive relationship should exist between educational attainment and earnings. The U.S. Census Bureau, in its *Current Population Reports*, collects data on the earnings of all persons by educational attainment. Figure 1 shows the median money income of individuals 25 years and older

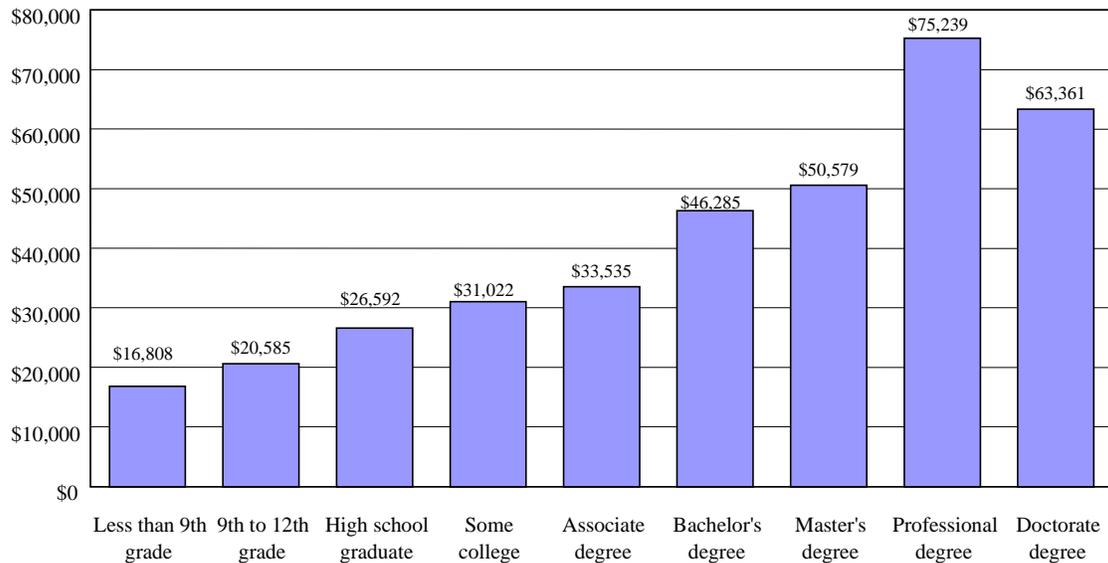
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<sup>1</sup> Theodore W. Schultz, “Investment in Human Capital,” *The American Economic Review* 51, no. 1 (March 1961), 1-17. Gary S. Becker, *Human Capital*, (1964; 2<sup>nd</sup> edition, New York, NY: National Bureau of Economic Research, 1975).

<sup>2</sup> Ann P. Bartel and Frank R. Lichtenberg, “Technical Change, Learning, and Wages,” National Bureau of Economic Research, Working Paper 2732 (September 1991).

who were employed full-time during all of 1998. This population is limited to full-time workers to adjust for the higher likelihood of unemployment among those with low education levels. If the population were not limited to those persons employed full-time in 1998, it would be unclear whether observed differences were due to higher productivity or higher probability of employment. By limiting the population to full-time workers, some of the employment effect is corrected for and the disparity between various levels of educational attainment is shown to range from \$16,808 to \$75,239.

**Figure 1. Median Earnings of All Full-Time Workers, by Educational Attainment: 1998\***



\*The income estimates in this table are based solely on money earnings before taxes. Noncash benefits are not included.

The population is both sexes, 25 years and over, who worked full-time all year in 1998.

Source: U.S. Census Bureau, *Current Population Reports*, P-60 Series, Table P-06.

These data permit a high school graduate considering college to evaluate the financial return to a college education. Figure 1 shows that in terms of annual median income, the average baccalaureate tends to earn nearly \$20,000 more than the average high school graduate.

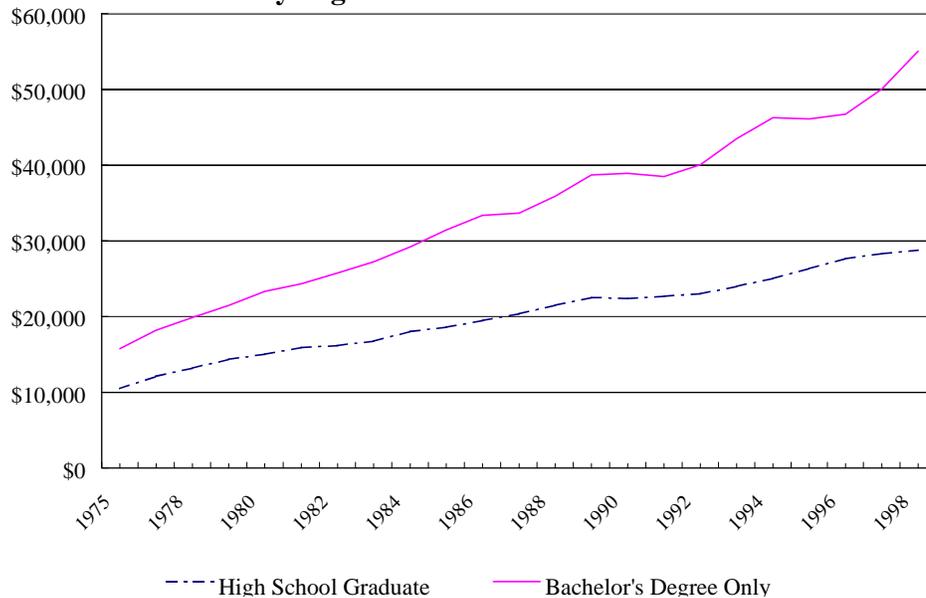
However, this analysis is incomplete because it ignores the investment costs of education. Individuals provide the majority of the resources for human capital investment through their own financial resources and the time spent acquiring additional education. A high school graduate, when considering college, will factor in the costs of education as well as the benefits. The cost of education borne by the student consists not only of tuition and living expenses but also of foregone earnings. Beyond high school, foregone wages are the largest component of investment in education. Any estimate of return to schooling must include the investment costs of that schooling.

Calculating the return on investment in education has intrigued economists since early this century. Initial analyses of the effects of education on earnings were done by

estimating tuition and foregone costs for given levels of schooling and then discounting the earnings differentials between workers at those different levels. Most estimates showed rates or returns on education comparable to rates of return on investment in physical capital. For example, Becker estimated returns to white males in 1949 of 20 percent for high school graduates and 13 percent for college graduates. These results are very similar to results found independently by Martin Carnoy and Dieter Marenbach over a similar period.<sup>3</sup>

Using a different methodology, two researchers at Princeton University, Orley Ashenfelter and Cecilia Rouse, estimated the private returns to education from 1979 to 1993. Evidence presented by Ashenfelter and Rouse indicate that a tremendous increase in the value of schooling has occurred since 1979. They found that the return to an additional year of education rose from 6.2 percent in 1979 to nearly 10 percent in 1993.<sup>4</sup> Although the future is unknown, the demand by firms for high levels of human capital seems to be increasing, tending to increase the future financial returns to education.<sup>5</sup>

**Figure 2. Mean Earnings of Male Workers 18 Years or Older  
by Highest Education Level: 1975-1998**



Source: Linda Levine, "Education Matters: Earnings by Highest Year of Schooling Completed," CRS Report for Congress 95-1081E. Updated October 1, 1999.

<sup>3</sup> Martin Carnoy and Dieter Marenbach, "The Return to Schooling in the United States, 1939-69," *Journal of Human Resources* 10, no. 3 (Summer 1975), 320.

<sup>4</sup> Orley Ashenfelter and Cecilia Rouse, "Schooling, Intelligence, and Income in America: Cracks in the Bell Curve," National Bureau of Economic Research, Working Paper 6902 (January 1999), 3.

<sup>5</sup> For more information on the changing U.S. economy and what it potentially means to firms and workers see Richard Crawford, *In the Era of Human Capital*, (New York, NY: Harper Business, 1991).

As noted previously, there is an increasing wage premium paid to workers with high levels of human capital attained through skills, training, and education. Figure 2 illustrates the increasing earnings disparity between college graduates and their high school counterparts. Although real earnings have increased for both groups since 1975, the nominal earnings differential between the two groups has grown.

Cohort data, which follow the same group of individuals over time, provide a different perspective on recent changes in the returns to education. The Bureau of Labor Statistics (BLS), using data from the National Longitudinal Survey of Youth, a survey following 9,964 young men and women from 1979 until 1996, found evidence of this increasing wage premium. Real hourly earnings rose for members of all education levels during the period. BLS research shows that the level of growth in real hourly earnings, however, depends on educational attainment. Among men aged 28 to 32, those with a high school education or lower were experiencing 1.1 percent annual growth rates in wages, compared to 5.4 percent for college graduates in the same age range.<sup>6</sup> Salaries one year after graduation for 1993 college graduates were 22 percent higher in real terms than salaries for 1975 graduates one year after graduation.<sup>7</sup>

An analysis of college graduates versus high school graduates often obscures the salary differences between major fields of study. Lewis C. Solmon and Cheryl L. Fagnano stated the reasoning behind the need for a more in-depth analysis of college graduates:

Just having a degree ignores qualitative differences between both institutions and areas of study. Individuals receiving different degrees from the same institution face different demands for their skills. The price of labor is not only a function of the marginal physical product of the laborer but also the price that the market is paying for that labor. Thus, individuals with similar ability levels in different fields can have significantly different earnings.<sup>8</sup>

Data from the U.S. Department of Education support this assertion. Figure 3 shows the starting salaries of those same 1993 college graduates by field of study. The median starting salary for an engineering or computer science student was over \$32,000. Salaries of computer science and engineering students are 35.8 percent above the median starting salary for all college graduates.<sup>9</sup> Clearly, decisions about the sort of education to acquire are as important as decisions concerning the amount of education to acquire.

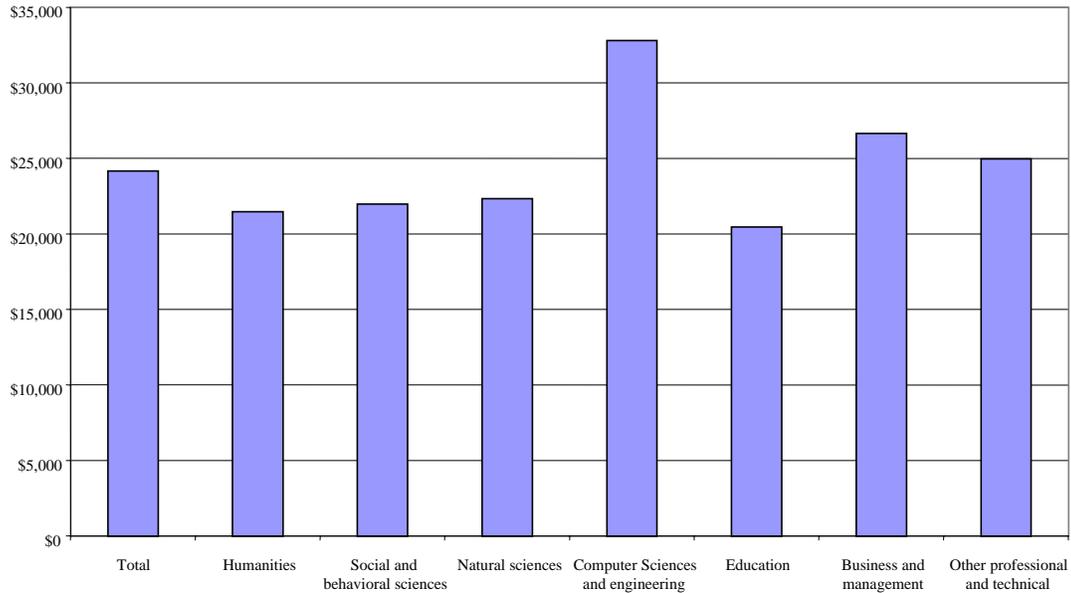
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<sup>6</sup> U.S. Department of Labor, Bureau of Labor Statistics, "Number of Jobs, Labor Market Experience, and Earnings Growth: Results from a Longitudinal Survey," Press Release USDL 98-253 (June 24, 1998).

<sup>7</sup> U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1997*, (NCES 98-015), Table 386 & JEC calculations.

<sup>8</sup> Lewis C. Solmon and Cheryl L. Fagnano, "Quality of Higher Education and Economic Growth in the United States," in *Higher Education and Economic Growth*, eds. William E. Becker and Darrel E. Lewis (Boston, MA: Kluwer Academic Publishers, 1993), 148.

<sup>9</sup> U.S. Department of Education, National Center for Education Statistics, *Condition of Education 1998*, (NCES 98-013), 110.

**Figure 3: Median Starting Salary of 1993 College Graduates by Major Field of Study**

Source: U.S. Department of Education. National Center for Education Statistics. *The Condition of Education 1998* (NCES 98-013), 106.

## EMPLOYMENT

The amount of education an individual receives not only affects his earnings, but the quality of his employment as well. In his book *Studies in Human Capital*, Jacob Mincer stated that educated workers have three advantages relative to less-educated workers: higher wages, greater employment stability, and greater upward mobility in income.<sup>10</sup> Increased earnings by workers with higher education levels are a result of two factors. First, as discussed earlier, increased human capital results in higher productivity that allows workers to extract higher hourly wages. Second, increased education increases labor force participation, decreases the probability of unemployment, and decreases job turnover. The result is that highly educated workers labor a greater number of hours annually for higher hourly wages than their less educated labor market competitors.

According to BLS projections, jobs requiring a “fairly high skill level” could account for 3 out of every 5 new jobs created between 1994 and 2005.<sup>11</sup> Thus, education is becoming increasingly more important in our new information economy. Recognition of the increased importance of education has caused many states to evaluate the quality of their educational systems to ensure that all students benefit. Securing a quality education for children from disadvantaged backgrounds is a primary goal of educational policy.

<sup>10</sup> Jacob Mincer, “Education and Unemployment,” in *Studies in Human Capital*, edited by Jacob Mincer, (Cambridge, UK: Edward Elgar, 1993), 212.

<sup>11</sup> Linda Levine, “The Education/Skill Distribution of Jobs: How Is It Changing?” CRS Report for Congress 97-764E (Washington, DC: Congressional Research Service, 1997), 5.

The importance of providing a quality education that will enable all children to succeed is becoming increasingly apparent.

In 1996, the majority of the population out of the labor force or unemployed resided in the lower rungs of educational attainment. Possession of a college degree in 1996 increased the probability of being in the labor force by nearly 23 percent over high school graduates.<sup>12</sup> Labor force participation is strongly associated with education even after controlling for other factors such as age and marital status.<sup>13</sup> Since those with a college education have more to lose by dropping out of the labor force (due to their higher earnings) than high school graduates do, they are more likely to remain in the labor force.

The results are similar for unemployment. According to BLS data, the unemployment rate among college graduates stood at 1.9 percent in January 1999.<sup>14</sup> High school graduates with no college were unemployed at a 4.1 percent rate. The gap in employment between college and high school graduates has been widening steadily.<sup>15</sup>

The negative relationship between education and unemployment exists due to two factors: more efficient job searching and increased job-specific human capital among those with higher levels of education. Mincer explains why more educated workers have lower unemployment: “the more informed the job search, the more likely is a successful job match, hence the longer are workers likely to stay on the next job.”<sup>16</sup> In the same study, Mincer finds that educated workers engage in higher levels of training specific to the firm, making workers more valuable to their firms thereby reducing the probability of involuntary (i.e., non-employee initiated) job turnover.

Despite the public perception is that job security is rapidly declining in today’s global marketplace, the evidence does not support this view. One National Bureau of Economic Research Working Paper found that there was no systematic change in the likelihood of long-term employment in the United States.<sup>17</sup> However, there have been changes in job tenure based on educational attainment. Men with little education are less likely to hold long-term jobs than they were twenty years ago, while female high school graduates are more likely to be in long-term jobs than they were in 1973.<sup>18</sup>

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<sup>12</sup> *Digest of Education Statistics 1997*, Table 375 & JEC calculations.

<sup>13</sup> William G. Bowen and T. Aldrich Finegan, *The Economics of Labor Force Participation* (Princeton, NJ: Princeton University Press, 1969), 53-62.

<sup>14</sup> U.S. Department of Labor, Bureau of Labor Statistics, “The Employment Situation: January 1999,” Press Release USDL 99-31 (February 1999), Table A-3.

<sup>15</sup> Wayne J. Howe, “The Effect of Higher Education on Unemployment Rates,” in *Higher Education and Economic Growth*, edited by William E. Becker and Darrel E. Lewis (Boston, MA: Kluwer Academic Publishers, 1993), 130-31.

<sup>16</sup> Mincer, 233.

<sup>17</sup> Henry S. Farber, “Are Lifetime Jobs Disappearing? Job Duration in the United States: 1973-1993,” National Bureau of Economic Research, Working Paper 5014 (February 1995).

<sup>18</sup> *Ibid.*

## NON-MARKET PRIVATE EFFECTS

Evaluations of the returns to schooling often analyze the labor market returns to education. The compensation for increased human capital formation is not limited to the earning of money. Education often affects the quality of life in ways rarely thought about or recognized. This section reviews the literature relating to the non-market outcomes of education.

Aside from the effect of education on increased earnings (hence, money available to spend on health care and likelihood of having employer-provided health benefits), persons with higher levels of education tend to have better health than those with lower levels. Individuals with high levels of human capital have made an investment in themselves, an investment that they protect by taking preventative measures to increase the probability of better health. Annual checkups, mammograms, and regular exercise can all be viewed as investments in the maintenance of human capital.

Two researchers at the Institute for Research on Poverty, Barbara Wolfe and Samuel Zuvekas, compiled a comprehensive review of the effect of non-market outcomes of education. Wolfe and Zuvekas find considerable evidence that a person increasing their level of schooling increases their health status.<sup>19</sup> The effect of education on health extends to loved ones as well. Evidence presented by Wolfe and Zuvekas point to a positive association between an individual's level of schooling and the health status of the person's family, controlling for other factors.<sup>20</sup> Other evidence supports this finding of a positive association between education and better health. One of the strongest findings was an empirical study by Michael Grossman. Grossman found that schooling has a positive and statistically significant effect on current health, even when controlling for past health.<sup>21</sup>

## III. PUBLIC RETURNS TO EDUCATION

### ECONOMIC GROWTH

Economists have been interested in economic growth since Adam Smith made his inquiry into the wealth of nations.<sup>22</sup> It was not until the introduction of the concept of human capital in the 1960s that economists attempted to study the relationship between education and economic growth. The pioneering work of Becker, Schultz, Mincer, and Edward F. Denison provided new information on the link between education and economic growth.

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<sup>19</sup> Barbara Wolfe and Samuel Zuvekas, "Nonmarket Outcomes of Schooling," Institute for Research on Poverty, Discussion Paper 1065-95 (May 1995), 3.

<sup>20</sup> Wolfe and Zuvekas, 1.

<sup>21</sup> Michael Grossman, "The Correlation Between Health and Schooling," In *Household Production and Consumption*, ed. Nestor E. Terleckyj (New York, NY: National Bureau of Economic Research, 1976), 220.

<sup>22</sup> Adam Smith, *The Wealth of Nations* (1776; reprint, Chicago, IL: University of Chicago Press, 1976).

The contribution of education to economic growth occurs through two mechanisms. The first, and most highly publicized, is through the creation of new knowledge, known as *Schumpeterian growth*.<sup>23</sup> Schumpeterian growth is growth attributable to increases in human capital. More highly educated individuals translate into more scientists, analysts, technicians, and inventors working to increase the stock of human knowledge through the development of new processes and technologies.

This leads us to the second way that education affects economic growth. Education affects economic growth through the diffusion and transmission of knowledge. Schools provide the education level necessary to understand and digest new information, and a way to transmit new information. Increases in educational levels helped the invention and innovation in the computer industry over the past 30 years, yet without schools to teach how to use computers and new applications, the effect of such innovation would be reduced.

Early attempts to analyze the increase in output of goods and services (i.e., economic growth) were incomplete. Estimation of the growth of output often left researchers with a large “residual”: a change in output (i.e., the dependent variable) not explained by the change in the explanatory, or independent variables. The application of human capital to this “growth accounting” allowed researchers to explain economic growth better. Researchers soon found that increases in human capital had a significant effect on economic growth.

Zvi Griliches and Dale Jorgenson did some of the earliest work in growth accounting and they concluded that increased levels of human capital explained half of one percentage point of the annual growth in output.<sup>24</sup> This meant that 15 to 20 percent of the annual average growth in output for the United States was explained by increases in education levels.

Other research confirmed this finding. Edward Denison undertook one of the most comprehensive studies on the effect of education on economic growth. Denison estimated that education per worker was the source of 16 percent of output growth in nonresidential business.<sup>25</sup> In another study done for the Rand Corporation, 21 percent of the growth in output from 1940-1980 was the result of an increase in average schooling

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<sup>23</sup> Named after Joseph Schumpeter (1883-1950) who was the originator of the theory that economic growth was strongly influenced by cycles of innovation. Northwestern economist Joel Mokyr titled the growth attributed to innovations and increases in man’s knowledge in honor of Schumpeter. Joel Mokyr, *The Lever of Riches* (New York, NY: Oxford University Press, 1990), 6.

<sup>24</sup> Dale W. Jorgenson and Zvi Griliches. “The Explanation of Productivity Change,” *Review of Economic Studies* 34, no. 3 (July 1967): 249-283. In addition, Zvi Griliches, “Notes on the Role of Education in Production Functions and Growth Accounting,” In *Education, Income, and Human Capital*, edited by W. Lee Hansen. 71-127, (New York, NY: Columbia University Press, 1970).

<sup>25</sup> Edward F. Denison, *Trends in American Economic Growth, 1929-1982* (Washington, DC: Brookings Institution, 1985).

levels.<sup>26</sup> Estimates of the effect of human capital on economic growth in the United States mostly range from 10 to 25 percent, although some recent evidence disputes this finding.<sup>27</sup>

By improving the productivity of American workers, education increases the wealth of the United States. To illustrate the magnitude of the effect of increased educational levels on economic growth in the United States, consider the effect on gross domestic product (GDP) if educational levels had stopped rising in 1959. In real terms (chained 1992 dollars), GDP rose from \$2,210.2 billion in 1959 to \$7,269.8 billion in 1997. If one were to assume that increased education levels contribute 16 percent to economic growth, and that this education improvement did not occur, the result would be that in real terms 1997 GDP would be lower by approximately \$1,260 billion dollars, standing at just over \$6,009 billion in 1997.

## NON-MARKET PUBLIC EFFECTS

Education benefits society in ways that cannot be measured by economic growth. Education enables Americans to be better mothers, fathers, children, voters, and citizens. Investment in education generates positive “neighborhood effects,” i.e., outcomes that yield significant gains to others. In his 1962 classic, *Capitalism and Freedom*, Nobel Laureate Milton Friedman described some of the “neighborhood effects” associated with education.

A stable and democratic society is impossible without a minimum degree of literacy and knowledge on the part of the citizens and without widespread acceptance of some common set of values. Education can contribute to both.<sup>28</sup>

Educational attainment correlates well with those items associated with a stable and democratic society – that is, informed and interested voters. Educated people read more about the issues, watch more news programs to stay informed, and take a more active interest in public affairs. Data from the *Condition of Education 1996*, published by the U.S. Department of Education, finds that 57 percent of Americans with four or more years of college voted during the 1994 congressional elections. Individuals with four

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<sup>26</sup> E.M. King and J.P. Smith. *Computing Economic Loss in Case of Wrongful Death* (Santa Monica, CA: The Rand Corporation, 1988).

<sup>27</sup> In contrast to the studies cited here, Robert J. Barro finds that while initial levels of schooling were important to economic growth, changes in the estimated levels of schooling did not contribute to growth over the 1960-1985 period. Robert J. Barro, “Economic Growth in a Cross Section of Countries,” *Quarterly Journal of Economics* 106, no. 2 (May 1991): 407-433. Zvi Griliches put forth a reason why no relationship between changes in human capital and changes in output was found in Barro’s work. Griliches noted that much of the growth in human capital in the economies studied by Barro was absorbed into the public sector and that the bureaucracy present in those public sectors may have blunted expected productivity gains. Zvi Griliches, “Education, Human Capital, and Growth: A Personal Perspective,” National Bureau of Economic Research, Working Paper 5426 (January 1996): 11.

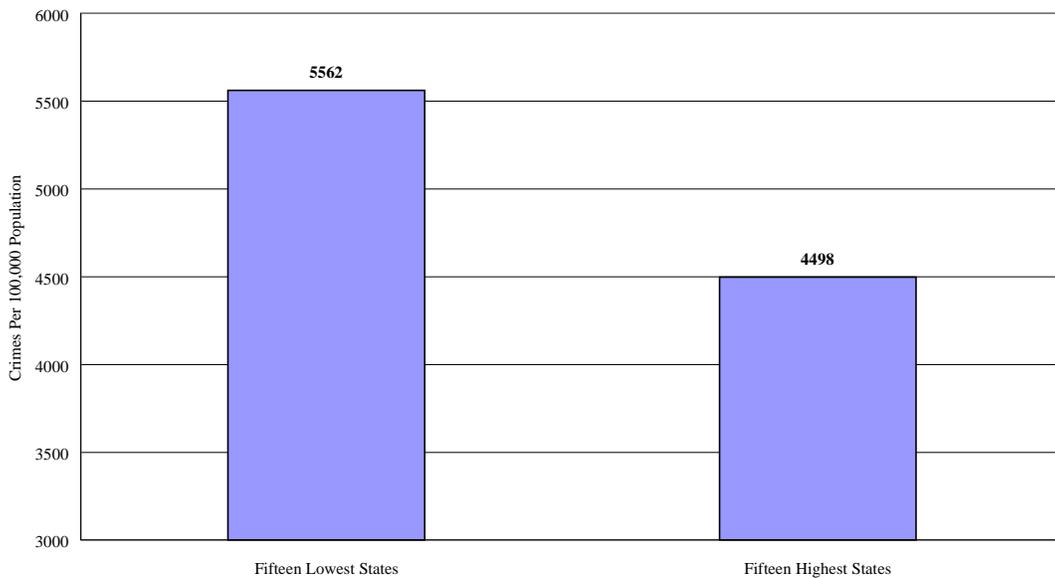
<sup>28</sup> Milton Friedman, *Capitalism and Freedom*, (1962, 4<sup>th</sup> ed, Chicago, IL: University of Chicago Press, 1964), 86.

years of high school voted at a rate of 30.6 percent. Other studies show that level of education influences voting more than any other socioeconomic factor.<sup>29</sup>

In evaluating the effect of educational levels on criminal activity, emphasis was placed on the overall level of education in society. As a first step, 15 states were identified that had the highest percentage of adults over the age of 25 with a high school diploma. The average crime rates were then compared with the average crime rate in the 15 lowest states (Figure 4). The crime rate per 100,000 people is 20 percent lower on average in the high education states.

The simple observation above, however, may have occurred by chance. It is possible that high educational attainment states had other qualities (e.g., higher law enforcement spending, older populations) that explain their low levels of crime. A more sophisticated analysis that incorporates other qualities appears appropriate.

**Figure 4. Comparison of Fifteen Highest Education States\* with Fifteen Lowest Education States in Terms of Crime, 1996**



\* The measure of education used is the following: percentage of population 25 years and older with at least a high school diploma.

Sources: *Statistical Abstract of the United States 1998*, Table No. 337 and *State Comparisons of Education Statistics: 1969-70 to 1996-97*, Table 1.

For example, a 1994 study by two researchers at the National Bureau for Economic Research found that youths that work and attend school have a decreased likelihood of engaging in criminal activities.<sup>30</sup> Additionally, their findings suggest that the acquisition

<sup>29</sup> On the effect of education on voting, see Raymond E. Wolfinger and Steven J. Rosenstone, *Who Votes?* (New Haven, CT: Yale University Press, 1980). Or W. Russell Neuman, *The Paradox of Mass Politics: Knowledge and Opinion in the American Electorate* (Cambridge, MA: Harvard University Press, 1986).

<sup>30</sup> Ann Dryden Witte and Helen Tauchen. "Work and Crime: An Exploration Using Panel Data." National Bureau of Economic Research, Working Paper 4794 (July 1994).

of education has a greater effect on crime reduction than the higher income that is associated with superior educational attainment. Other researchers, analyzing recidivism rates of criminals, found that convicts with low levels of education had a higher probability of recidivism than convicts with high levels of education.<sup>31</sup>

Data suggest that there is also a reduced reliance on welfare and public assistance programs among those with higher levels of education. In 1996, for example, 25-34 year-olds who were high school graduates were ten times as likely as college graduates to have received income from Aid to Families with Dependent Children or public assistance income.<sup>32</sup> These data are consistent with empirical work by Chong-Bum An, Robert Haveman, and Barbara Wolfe in *The Review of Economics and Statistics* that showed less reliance on income transfers among those with increased education.<sup>33</sup>

Other evidence confirms the link between education and illegitimacy. The probability of a woman who has never married having a child decreases dramatically as she acquires more schooling. According to a recent Census Bureau release, the probability that an unmarried woman between 25-34 years of age who is not a high school graduate will have a child is 68.9 percent. For unmarried women with a bachelor's degree the illegitimacy rate is 7.8 percent.<sup>34</sup> This finding, however, does not hold other factors constant and illegitimacy may therefore be a result of some other quality. Using econometric analysis to hold other qualities constant, An, Haveman, and Wolfe also find evidence that a negative relationship exists between education and out-of-wedlock births.<sup>35</sup>

#### IV. POLICY IMPLICATIONS

Traditional concern about the educational opportunities of the poor, as it has evolved in the American context, has resulted in the public provision of education. The public provision of education predates our independence beginning in 1647 with the passage of the Massachusetts Bay Colony's first schooling legislation. A tradition of state guidance, but local financing and control has characterized American public education for the majority of the past two centuries. Federal, state, and local government authorities all recognize the importance of education and share a common goal of ensuring that *all* Americans have access to quality education.

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<sup>31</sup> A. J. Beck and B.E. Shipley, *Recidivism of Prisoners Released in 1983*. Bureau of Justice Statistics Special Report NCJ-116261. Washington, DC: U.S. Department of Justice, 1989.

<sup>32</sup> U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 1998*, (NCES 98-013), 108.

<sup>33</sup> Chong-Bum An, Robert Haveman, and Barbara Wolfe, "Teen Out-of-Wedlock Births and Welfare Receipt: The Role of Childhood Events and Economic Circumstances," *The Review of Economics and Statistics* 75, no. 2 (May 1993).

<sup>34</sup> Amara Bachu, *Fertility of American Women: June 1995*, U.S. Bureau of the Census, Current Population Report Series P20-499.

<sup>35</sup> *Ibid.*, 206.

Recently, dissatisfaction with aspects of the educational system in the U.S. has increased as more data becomes available showing overall student achievement in a steady decline. Consequently, efforts to implement broad, systematic educational improvements have intensified. Some education experts and policymakers have advocated loosening federal requirements that restrict or impede educational reform. While often agreeing with the goals of federal programs and mandates, they have expressed concern with the rigid application and “one size fits all” nature of most federal education programs. They argue that proximity to parents and to local conditions enable local officials and parents to achieve greater results with the same resources.

Broadening the flexibility given to state and local education agencies, however, may raise concerns about accountability. Opponents of flexibility argue that without the guidance of specific regulatory provisions, states and local school districts may fail to meet the desired objectives. In addition, due to the limited political power of those most affected by this failure, state and local education agencies may not be accountable for their mistakes.

However, this idea of centralism relies on the unrealistic assumption that those farthest from the provision of education of children know the best course of action. Such an assumption is unrealistic because it fails to account for differences in knowledge among decision-making units. One of the central insights of *Knowledge and Decisions*, the seminal work by Thomas Sowell, is that differences exist in the costs, quantity, and quality of knowledge obtained by higher decision-making units respective to lower decision-making units. Sowell has pointed out:

...the persistence of knowledge advantage by the subordinate units implies either an impossibility or a prohibitive cost to the higher unit of independently acquiring the same knowledge as a check against the accuracy of the knowledge transmitted by the subordinate unit. In short, there are *differences* in the respective costs of acquiring knowledge. More specifically, there are cost differences between higher and lower higher and lower decision-making units which vary according to the *kind* of knowledge in question.<sup>36</sup> (*emphasis in original*)

A national or central office may sometimes have superior access to information about national trends. But for highly specific knowledge -- the need for more teachers, the effectiveness of class size reduction, the need for after-school programs, the quality of school infrastructure -- the subordinate units in daily contact with the relevant facts can compile, analyze, and utilize knowledge regarding education in a more cost-effective manner. Federal flexibility reforms neither increase nor reduce federal dollars going to education. Rather, they reflect the differences in knowledge between decision-making units and the common goal of increased student achievement that all concerned policymakers, be they federal, state, or local, are working towards.

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<sup>36</sup> Thomas Sowell, *Knowledge and Decisions*, (New York, NY: Basic Books, 1996), 13.

## V. CONCLUSIONS

This paper has detailed the enormous benefits associated with increased education. Investment in human capital enables individuals to increase their future earnings and enhance their experience in the labor market. The knowledge that education benefits the individual student in terms of increased earnings is widespread, but information is incomplete about the benefits that increased education has on society. In the information economy of the 21<sup>st</sup> century, education will become increasingly important. Investment in education contributes to enhanced labor force productivity and enables individuals to become better citizens and parents in addition to being better workers. The effectiveness of American education will have an important impact on U.S. economic performance for the foreseeable future.

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Investment on education has both private and public returns-individual and social. Individuals with more human capital manage to be very efficient at their employment search, and less suffer from unemployment. Most educated people have high labor productivity that effects on the profit of the firm and its market evaluation. Due to investment in education the profit recently, the macro-economic situation in most EU countries has changed significantly. At the EU level, in 2004 the main components of public spending were social protection, general public services and health, and education. It can 3 The Public funding and private Returns to Education (PuRE) studies the impact of different systems of public financial support on education on observed outcomes in the labour market, private returns to education and education-related inequality in earnings. 4 Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.