IT'S NOT JUST THE MONEY

THE BENEFITS OF COLLEGE EDUCATION TO INDIVIDUALS AND TO SOCIETY

by Philip Trostel
    Margaret Chase Smith Policy
    Center & School of Economics
    University of Maine

Summary

In some contexts an issue basically boils down to the monetary bottom line. In other contexts, though, focusing just on the dollars is like throwing the baby out with the bathwater. Narrowly defined economics does not always capture all of the essential aspects of an issue. The value of a college education is one such example.

The value of a college education is often presented in purely monetary terms, probably because the average monetary payoff from a college degree is so high. The substantial financial rewards from obtaining college degrees are well known and documented. The link between college attainment and economic prosperity has been clearly demonstrated for individuals, as well as for cities, states and nations.

It is no secret that the financial payoff is only one of the benefits from a college education. But the other benefits, and particularly their magnitudes, are considerably less well known. These other benefits of college education are often difficult to quantify and harder to demonstrate. Consequently, these frequently unmeasured benefits are often ignored in policy discussions. It is sometimes joked that "if you can't measure it, it doesn't exist." Unfortunately, there is more than a grain of truth in this quip. But the lack of quantification does not make the benefits any less real or any less important, except for perhaps in policy discussions. Moreover, the "other" benefits of college education appear to be at least as important as the well-known effect on earnings. Thus, public policy debates about postsecondary education frequently omit more than half of the story.

This report provides a more complete picture by highlighting many of the frequently unmeasured and ignored benefits of college attendance. Education has numerous beneficial effects, and many of these have been estimated in large academic literatures. But research articles typically carefully examine just one effect. This report organizes and compiles the evidence from several different literatures into one easily accessible place.

On average in 2012, Americans with bachelor's degrees (and without graduate degrees) receive the following benefits in comparison to high school graduates never attending college:

- Annual earnings are about $32,000 (134 percent) higher. Moreover, there is no evidence that the college earnings premium is declining. Indeed, it has been increasing.

- Lifetime earnings are, conservatively, about $625,000 (114 percent) greater in present discounted value (using a 3 percent real interest rate and taking forgone earnings while in college into account).

- The incidence of poverty is 3.5 times lower.

- The likelihood of having health insurance through employment is 47 percent higher. Annual additional compensation in the form of employer contributions for health insurance is $1,400 (74 percent greater).

- The likelihood of having a retirement plan through employment is 72 percent greater. Retirement income is 2.4 times higher.

- Job safety is greater. The incidence of receiving workers' compensation is 2.4 times lower.

- Measures of occupational prestige are significantly higher.

- The probability of being employed is 24 percent higher.

- The likelihood of being unemployed is 2.2 times lower.
- The likelihood of being out of the labor force (neither employed nor unemployed) is 74 percent less.
- Age at retirement is higher. The probability of being retired between the ages 62 through 69 is about 25 percent lower.
- The likelihood of reporting health to be very good or excellent is 44 percent greater.
- The likelihood of being a regular smoker is 3.9 times lower. The incidence of obesity and heavy drinking are significantly lower. The likelihood of exercising, having a healthy diet, wearing seat belts and seeking preventative medical care are significantly higher.
- The incidence of a disability making it difficult to live independently is 3.6 times lower.
- Life expectancy at age 25 is seven years longer (for those having at least some college compared to those never having gone to college).
- Asset income is 4.9 times greater ($1,900 more per year).
- The likelihood of not having a bank account is 8.1 times lower. Reliance on expensive forms of banking and credit is significantly lower.
- The probability of being in prison or jail is 4.9 times lower.
- The probability of being married is 21 percent higher and the probability of being divorced or separated is 61 percent lower.
- The likelihood of being happy is significantly higher.

The total value of a college education is thus considerably greater than just the higher earnings. But the catalog of benefits above lists only those accruing to the degree holder. There are also substantial benefits accruing to the rest of society. On average in 2012, the rest of American society receives the following benefits from those with bachelor's degrees (and without graduate degrees) in comparison to high school graduates never attending college:

- Although the evidence is not completely conclusive, the positive effect on the aggregate earnings of others appears to be roughly similar to the effect on own earnings.
- Lifetime taxes are, conservatively, $273,000 (215 percent) greater in present discounted value (using a 3 percent real interest rate and taking into account forgone taxes while in college). That is, college graduates contribute hundreds of thousands of dollars more toward government services and social insurance programs.
- Lifetime government expenditures are about $81,000 (39 percent) lower in present value. College graduates rely much less on other taxpayers.
- The lifetime total fiscal effect is roughly $355,000 in present value.
- Crime is significantly lower.
- Volunteering is 2.3 times more likely. The estimated value of volunteer labor is 4.1 times ($1,300 annually) greater.
- Employment in the nonprofit sector is twice as likely. The estimated value of the implicit wage contribution to nonprofits is 8.7 times ($1,500 annually) greater.
- Annual cash donations to charities are $900 (3.4 times) higher.
- Total philanthropic contributions (i.e., the value of volunteer labor plus the value of the implicit contribution to nonprofits plus cash donations) are $3,600 (4.7 times) higher.

- Voting and political involvement are significantly higher.
- Participation in school, community, service, civic and religious organizations is substantially (1.9 times) higher. Leadership in these organizations is particularly (3.2 times) greater.
- Community involvement is significantly greater. For example, attendance at community meetings is 2.6 times greater.
- Neighborhood interactions and trust are significantly higher.

The magnitude of the total benefits to the rest of society is comparable to the substantial total benefits to college graduates. Moreover, these long lists represent just the (imperfectly) measurable benefits of college attainment. There are numerous vitally important effects that are almost impossible to quantify such as the positive influences on innovation, arts, culture, diversity, tolerance and compassion.

The evidence is overwhelming that investment in college education pays in a big way both for individuals and for society. But the typically emphasized financial payoff is only small part of the story. It is not overstatement to call the effect on earnings just the tip of the college-payoff iceberg. There are more benefits to college education beneath the surface than above it.

GREATER EARNINGS

OTHER BENEFITS

Contents

Introduction

In fiscal year 1981, 50 percent of all current-fund revenues of U.S. public degree-granting institutions were from federal, state and local government appropriations. The share of revenues from government appropriations in 2001 had fallen to 36 percent (both percentages are from Synder, Dillow and Hoffman, 2009, Table 349). In fiscal year 2012, the government-appropriations share of revenues of public degree-granting postsecondary institutions had fallen further to 22 percent (calculated from Synder and Dillow, 2014, Table 333.10). Our actions speak volumes. Americans increasingly perceive college education as a private good, that is, a product that primarily benefits the individuals earning degrees.

College graduates certainly do benefit from their degrees, at least on average. The substantial monetary payoff to investment in college education has been demonstrated in countless reports. Even if the only benefit was the creation of human capital and higher future earnings, college education is a great investment opportunity for most high school graduates. The repeated demonstrations of the effect of college education on earnings have an unfortunate side effect, though: Many other important effects tend to be overlooked. The public-good aspects of college attainment appear to be increasingly forgotten in public policy discourse.

This report provides a fuller and more balanced demonstration of the measurable benefits of college education. This is certainly not the first study to summarize the evidence on the numerous beneficial effects of education. Some of the predecessors are Haveman and Wolfe (1984), the Institute for Higher Education Policy (1998, 2005), Wolfe and Haveman (2003), Baum and Payea (2004), McMahon (2004), Grossman (2006), Lochner (2011), and Oreopoulos and Salvanes (2011). This report updates and extends these earlier works. Specifically, numerous effects of college education found in previous studies are reproduced in this report using a consistent framework and using recent data (mostly from 2012). Where this is not practical, the results in the previous literature are summarized. A few new findings on the benefits of college education are also presented in this report.

Scope

The scope of this report differs from most of the previous studies in that it focuses narrowly on college education, while most of the aforementioned studies examined the effects of education generally. This report also differs in examining the different levels of college education, not just on the attainment of bachelor's degrees as is common in much of the literature. Specifically, this study quantifies the distinct of effects of: some college attendance but without earning a degree, associate degrees, bachelor's degrees and graduate degrees. Distinctions are not made between master's, professional and doctoral degrees to try to avoid being tedious and, more importantly, to avoid the problem of imprecise estimates due to too few observations.

To highlight the effects from each specific level of college attainment, this report also differs from many of its predecessors by being less of a review of the various literatures on the effects of education (although this report does review the relevant literatures), and more of a presentation of estimates. Much of the research on the effects of education, indeed, most of it, does not distinguish between, say, the effects of completing some college and the effects of completing an associate degree.

An advantage of approach in this report is that facilitates comparisons of the different effects. The numerous studies on the effects of education use somewhat different measures (e.g., sometimes the only the attainment of bachelor's degrees is emphasized, while other studies emphasize having any college experience, etc.) from different subsamples (e.g., sometimes men and women age 25 and older are studied, while other reports examine men age 18 to 64, etc.) from different datasets and from different years. The various datasets are examined here using a consistent framework, making it easier to compare, say, the effects on philanthropy to the effects on fringe benefits.

The data examined in this study are recent, typically 2012. All dollars reported here are 2012 values. All subsamples (except for when estimating lifetime totals) are men and women ages 27 through 66. This report does not follow the typical approach of examining ages 25 through 64 because the full-benefit retirement age for Social Security is now 66 years old and is scheduled to rise to 67 before the end of this decade. Also, more young people are going to graduate school and are not entering the labor force full time until after age 25. With just a couple of exceptions, all results are presented for the separate levels of college attainment. To further ease the comparison of effects, all results are presented as average effects per college degree.

To confine the scope to a reasonable dimension, this report examines evidence for the United States. There is a great deal of evidence on the effects of education in other countries. The results are generally similar across counties, though. Significant international differences in the effects of education are much more of an exception than the rule.

This report summarizes the various benefits of individuals attaining college degrees, but not the benefits from colleges generally. In addition to educating students, colleges create important benefits from research and public service activities. But these effects are beyond the scope of this study.

Similarly, this report does not address the difference between college attendance and college attainment. These terms are used interchangeably here, and issues about college persistence are not examined. This report presents the results for the attainment of college degrees, but only because it is dictated by the data.

Classification of Benefits

The organization of this report follows the standard approach used in the economics of education. In particular, the "private benefits" of college education are presented first. Private benefits are those that accrue to the individuals obtaining the degree (and their families). Important benefits also accrue to the rest of society and are typically called "external" or "spillover" benefits.

Although the primary intention of this report is to highlight and emphasize the lesser-known benefits of college attainment, the well-known and thoroughly quantified effect on earnings, or "college earnings premium," is summarized first. This provides a well-known reference point for comparison to the "other benefits" shown subsequently.

The other important private benefits of college attainment summarized in this report are: more fringe benefits from employment, such as employer contributions for employees' health insurance and retirement plans; reduced risk of unemployment and higher rates of participation in the labor market; better health and reduced risks of disability and mortality; increased savvy in making

spending and financial decisions; reduced risk of imprisonment; better marriages; increased life satisfaction; and these benefits, on average, are partially passed on to children.

There are also numerous external benefits from college attainment. Possibly the most important of these is the knowledge creation and technological change fostered by college education. A similar but distinct external benefit is from complementarity in worker productivity. That is, there is evidence that college-educated workers increase the productivity of their co-workers (as well as being more productive themselves, which is reflected in their higher earnings).

Another important type of external benefit is "fiscal externalities." These are the additional tax revenues that college graduates pay because their incomes are higher, and the reduced spending in numerous types of government public assistance and social insurance for college graduates. Trostel (2010) demonstrated that the increased tax revenues after graduation are several times larger than public spending on postsecondary education. Moreover, the reduced government spending after graduation is larger than public spending on college education before graduation. Thus net government spending for higher education is negative. This report updates the earlier estimates.

Other important external benefits from college education quantified in this report are: reduction in crime; increased philanthropy and volunteerism; increased civic participation such as higher rates voting; increased community involvement; and increased "social capital."

Caveats

Numerous beneficial effects of college attainment are separately identified and summarized in this report. It is important to note, however, that many of the effects are unlikely to be independent. Thus, a simple summation of all the separate effects risks double counting. For example, part of the college premium in earnings is due to differences in labor force participation. The higher incomes associated with college attainment enable college graduates to purchase more preventive health care, which presumably improves their health, on average. Conversely, the better health associated with college attainment enables college graduates to work and earn more, on average. It is possible that college graduates being healthier, being less likely to be unemployed and more likely to be married could mostly explain the observed correlation between education and life satisfaction.

There are numerous ways that the observed beneficial effects of college attainment are interdependent. A careful calculation of the total private and external benefits of college attainment would need to disentangle these interdependencies to prevent over counting. This report does not attempt a calculation of the total benefits, though.

Nor does this study dig into the underlying ways that college education creates the observed beneficial outcomes. There are many interesting questions about specifically how college education leads to better health, increased likelihood of successful marriages, increased life satisfaction, greater generosity, increased community involvement, etc. Questions such as these, though fascinating and important, are well beyond the scope of this report.

Similarly, this report generally does not dig into issues of causation. A long-standing worry in attempting to quantify the various effects of education is that the observed correlations are not necessarily causal effects. For example, the strong positive correlation between education and earnings

does not necessarily prove that education causes earnings to be greater. Higher-ability and/or higher-motivation individuals generally obtain more education and have greater earnings potential independent of their levels of education. The same can be argued for the numerous other outcomes examined in this report. The observed correlations may be largely the result of omitted-variables bias (also often referred to as ability bias in this context).

Countless studies have used different econometric methods to identify causal effects of education. Card (1999) and Harmon, Oosterbeek and Walker (2003) review the large literature on estimating the causal effect of education on earnings. Lochner (2011) reviews the literatures on estimating the causal effects of education on health, crime and civic behaviors. Oreopoulos and Salvanes (2011) estimated causal effects of education on unemployment, receiving public assistance, receiving disability income, divorce, occupational prestige, incarceration, voting and life satisfaction.

Despite the plausibility of the ability-bias hypothesis, these literatures have generally found that the observed correlations are evidently causal effects of education. Although there are a few exceptions, it generally appears that the correlations are not misleading about the causal effects. Instances of causal estimates being noticeably lower than the observed correlations (after controlling for other potentially confounding factors) are not common.

For this reason, and because the estimation of causal effects typically reduces the precision of the estimates substantially, as well as being substantially more complicated than examining correlations, this report reports ordinary correlations between college attainment and various outcomes. Previous research on many different outcomes suggests that it is not likely that these results are statistically biased.

Earnings

The higher average earnings of college graduates is clearly an important benefit of going to college. Indeed, this effect is often presented as *the* benefit of going to college. This is the effect generally emphasized in the human capital view of education. This effect is also fairly easy to quantify, and the evidence is readily understood (i.e., it is easy to comprehend the idea of an extra $32,112 per year).

The primary purpose of this report, however, is to emphasize the other benefits that may be equally, if not more, important. Nonetheless, the average effect of college education on earnings is the quantified first to provide a consistent and well-known comparison point for the effects presented later.

Figure 1 shows the average annual labor earnings of Americans age 27 to 66 and not enrolled in college in 2012, using data from the American Community Survey. This chart illustrates the well-known fact that average earnings increase substantially with education attainment.

Average earnings of high school graduates with no college experience is about $24,000 per year. As low as this may seem, it is still far greater than the average annual earnings of a little more than $14,000 for those without a high school diploma or its equivalent. Average earnings of high school graduates with some college but no degree is more than 31 percent greater (close to $8,000 annually) than high school graduates who never attended college. Holders of associate degrees as their highest education qualification earn 51 percent more ($12,000) than high school graduates with no college.

The difference in average earnings from college attendance is commonly referred to the college earnings premium. The earnings premium for bachelor's degrees is particularly large: 134 percent ($32,000 in additional earnings annually). The earnings premium for graduate degrees (master's, professional and doctorates) is 46 percent ($26,000), although this premium is relative to average earnings of those with bachelor's degrees as their highest education credential. (Because a bachelor's degree is generally a prerequisite for advanced degrees in the same way that a high school diploma is generally a prerequisite for undergraduate degrees.)

Figure 1
Average Annual Earnings
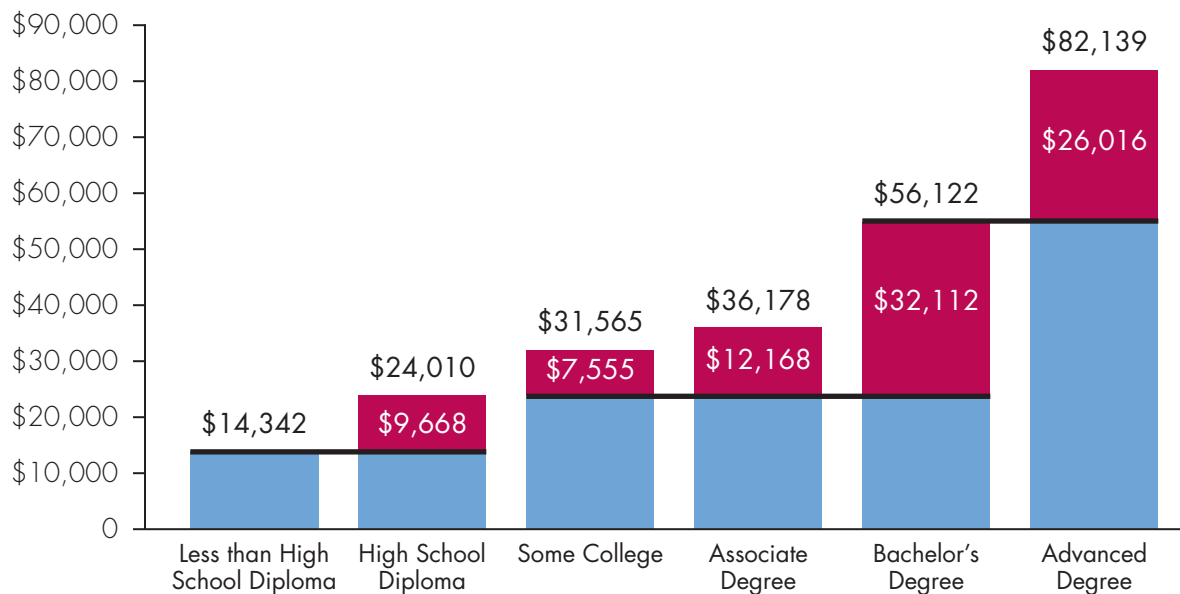
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

Trend in the Earnings Premium

As noted earlier, the relationship between education and earnings revealed in Figure 1 has been shown in countless previous studies over the past several decades. This is one of the most investigated empirical regularities in all of social science. A subset of this literature has examined the changes in the magnitude of the college earnings premium. Significant, and perhaps surprising, changes have been observed over time.

Interest in the trend in the college earnings premium goes back to the "overeducation" work of Freeman (1975, 1976). The proportion of Americans with college degrees increased substantially in the 1950s and 1960s, and the college earnings premium began to shrink in the early 1970s. The conjecture at the time was that the monetary return to college education would continue to shrink as the relative supply of college-educated labor continued to grow and as colleges reached deeper and deeper into the pool of raw talent.

The declining college earnings premium turned out to be short-lived. The economic return to higher education rose significantly in the 1980s. Generally there was an upward trend in the college earnings premium throughout the latter half of the 20th century. See Deere and Vesovic (2006), Autor, Katz and Kearney (2008), and Carneiro and Lee (2011) for recent reviews of the literature

Figure 2
## Trend in Degree Premia in Earnings
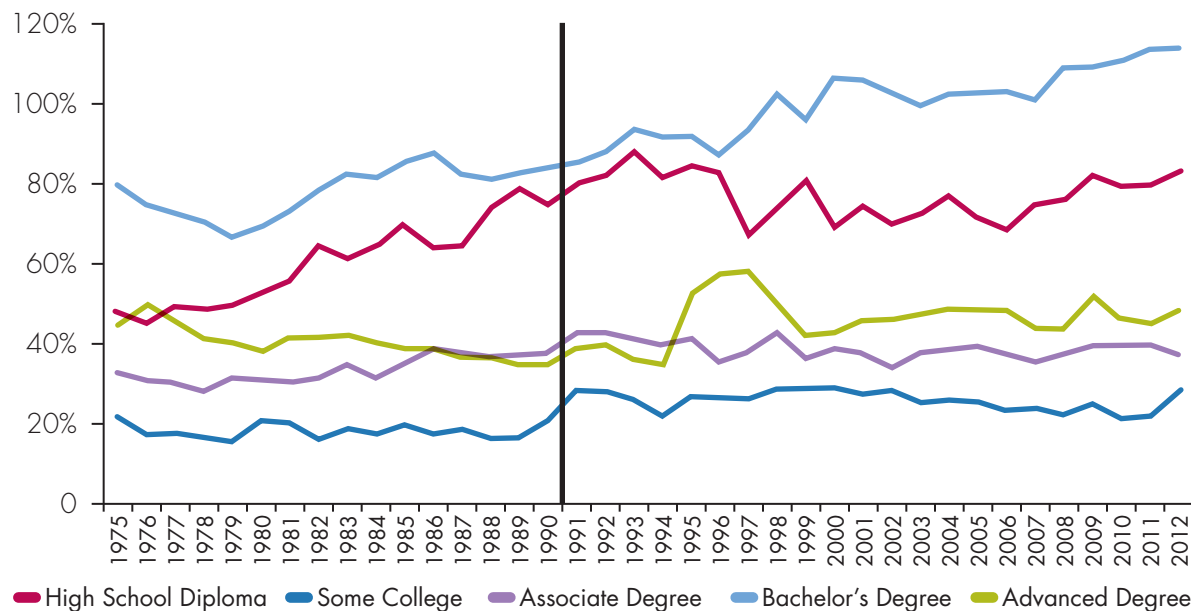
Source: Author's calculations using the 1976-2013 March Social and Economic Supplements of the Current Population Survey, ages 27-66 and not enrolled in college, N = 3,318,430.

on this topic. Nonetheless, fears of a glut of college-educated workers and falling returns to college education persist, particularly in the recent macroeconomic recession.

As shown in Figures 2, fears of overeducation are not supported by the data. This chart was derived using data from the 1976-2013 March Social and Economic Supplement of the Current Population Survey because it goes back further back in time than the American Community Survey. As in Figure 1, the data in Figure 2 are real annual labor earnings of Americans aged 27 to 66 and not enrolled in college. The measure of education attainment was changed (from years of completed education to highest education credential) in 1991. Thus, the measured earnings premium is not completely comparable before and after 1991, but this appears to be significant only for some college and no degree (13 years of completed schooling) and perhaps associate degrees (14 or 15 years of completed schooling).

The college earnings premium increased significantly during the recent economic downturn. This, however, should not be interpreted as college graduates being immune from the economic harm of the recession. Average real earnings for all education categories declined significantly in recent years. But the decline in average earnings was generally the most severe for those with the lowest levels of education. The earnings premium rose because there was a larger percentage decline in the real average earnings of high school graduates.

Figure 3
Trend in Average Earnings (in 2012$)
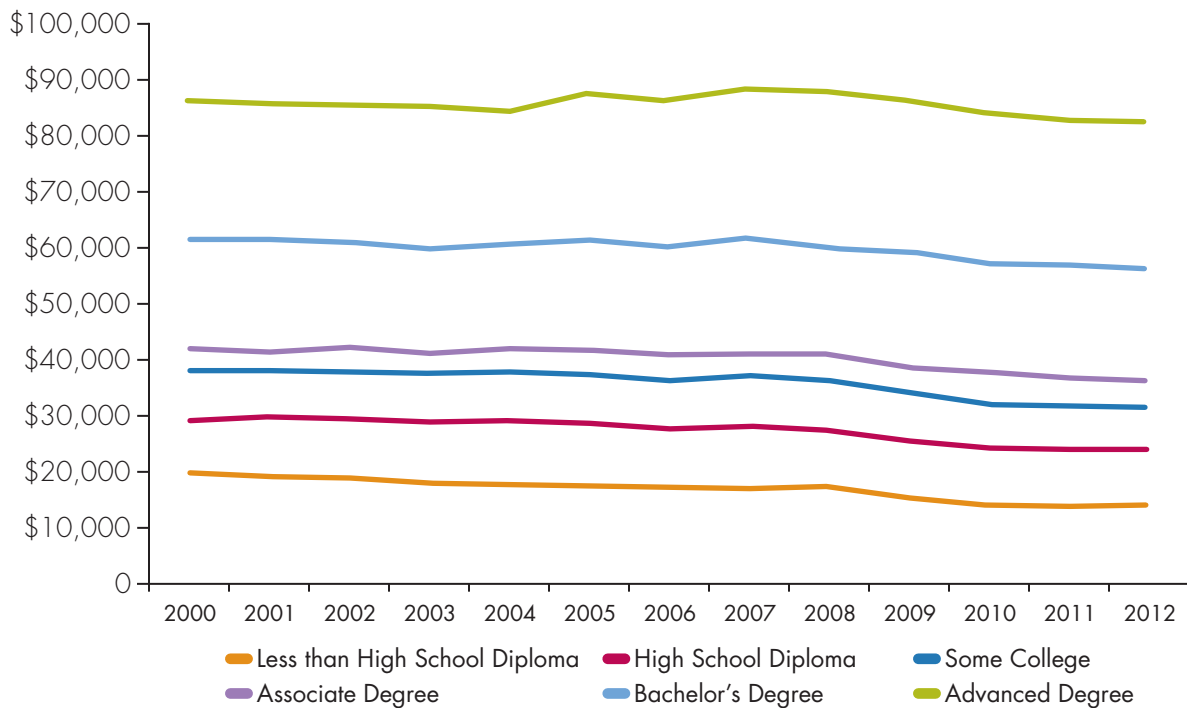
Source: Author's calculations using the 2000-2012 American Community Survey Public Use Microdata Samples, ages 27-66 and not enrolled in college, N = 14,591,925.

This is illustrated in Figure 3, which shows the recent changes in real average annual earnings using data from the American Community Survey. Dollar values before 2012 are converted into real 2012 dollars using the Consumer Price Index. Average real earnings of high school graduates with no college fell by 14.8 percent from 2007 to 2012. The decline was even more severe for those with less than a high school diploma, 16.6 percent. Average real earnings for those with some college but no degree fell by 14.6 percent over the five years. The declines were 11.9 percent, 8.8 percent and 6.8 percent for associate degrees, bachelor's degrees and graduate degrees, respectively.

College education clearly does not ensure immunity from economic downturns, but it did substantially reduce the risk of earnings losses in the last recession.

Lifetime Earnings Premium

Perhaps a more useful way of displaying the college earnings premium is in terms of the present discounted value of the average difference in lifetime earnings. This allows one to perform a rough benefit/cost calculation on if a college education is financially worthwhile, on average.

Figure 4
Percent Value of Lifetime Earnings
(At age 19 using a 3% discount rate)
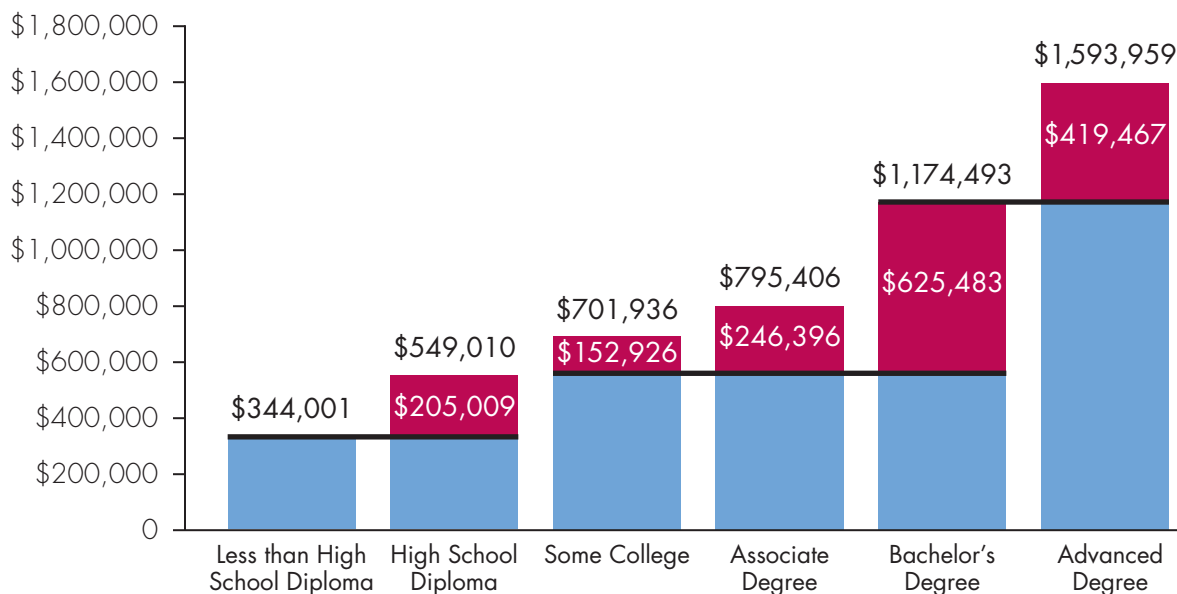
Source: Author's estimates using data from the 2012 American Community Survey Public Use Microdata Sample.

The present value of the lifetime college earnings premium is illustrated in Figure 4. To be more specific, it shows conservative rough estimates of the present value of lifetime labor earnings at age 19 in 2012 using a 3 percent real discount rate. The numbers are calculated by first estimating an age profile of earnings (i.e., average earnings at every age from 19 through age 79) using data from the 2012 American Community Survey, and then applying a 3 percent annual discount rate to earnings at every age greater than age 19. The numbers err on the conservative side because no growth in earnings is assumed.

To estimate the average lifetime earnings across different levels of college attainment in Figure 4 simple "traditional" career paths are assumed. That is, the work career is assumed to begin at age: 17 for those with less than a high school diploma, 19 for high school graduates, 20 for those with some college but no degree, 21 for associate graduates, 23 for bachelor's graduates, 26 for advanced graduates. Students are assumed to progress straight from high school to college and from matriculation to graduation in the standard number of years (advanced degrees are assumed to take an average of three years) without working part time. Thus, these estimates take into account a student's forgone earnings while in college.

Obviously many college students take more than the standard numbers of years to graduate. Thus, for many college graduates the benefits of college attainment occur later than assumed in Figure 4, and the assumption that students are traditional on average overstates the present value of the lifetime

earnings differentials. On the other hand, many students work part-time while in college and/or work full-time while taking time out from college. Indeed, presumably these are the main reasons that many students take longer than usual to graduate. Thus, the assumption that students are traditional on average also understates the total present value. The assumption implicit in deriving Figure 4 is that these effects roughly offset each other.

Given the above assumptions, the present value (at age 19) of average lifetime earnings of a high school graduate with no college is $549,000 (the undiscounted sum is about $1,096,000). The present value of the additional lifetime earnings of those with some college but no degree is about $153,000 (the undiscounted difference is $339,000). For associate degrees the present value of the net additional lifetime earnings is about $246,000 ($522,000 if not discounted). The average additional lifetime earnings is more than $625,000 for bachelor's degrees ($1,383,000 when not discounted). For advanced degrees the present value of average lifetime earnings above a bachelor's degree is more than $419,000 ($1,085,000 when not discounted). These estimates take into account both the forgone earnings while in school and the time value of money.

Moreover, the above estimates are conservative because they do not account for future growth in real earnings. If future earnings were to grow at 0.633 percent annually, which is the average compound growth rate of real earnings from 1975 to 2012 in the Current Population Survey data for those ages 27 to 66 (despite real earnings being lower in 2012 than in 1998), the present value of the lifetime earnings premium for bachelor's degrees would rise from $625,000 to $735,000.

Although there are legitimate concerns about rising tuition and student debt discouraging potential students from a college education, it is still the case that college is a very worthwhile investment even in just purely financial terms.

Poverty

College education not only leads to higher earnings, on average, it also significantly reduces the possibility of being at the low end of the income spectrum. This is illustrated in Figure 5 which shows poverty rates in 2012. To give this more context, U.S. average poverty thresholds in 2012 were $11,720 for a single person and $23,492 for a family of four.

An astonishing one out of every 3.2 adults (age 27 to 66) without a high school diploma was in poverty in 2012. One out of every 6.5 high school graduates without college lived in poverty. The incidence of poverty was 27 percent less for those with some college but no degree compared to high school graduates without college. The poverty rate for associate degree holders was barely half of the rate for high school graduates. Holders of bachelor's degrees but without advanced degrees were about 3.5 times less likely to be in living in poverty. Clearly, college attainment substantially reduces the risk of low income.

Figure 5
Family Income Under the Poverty Line
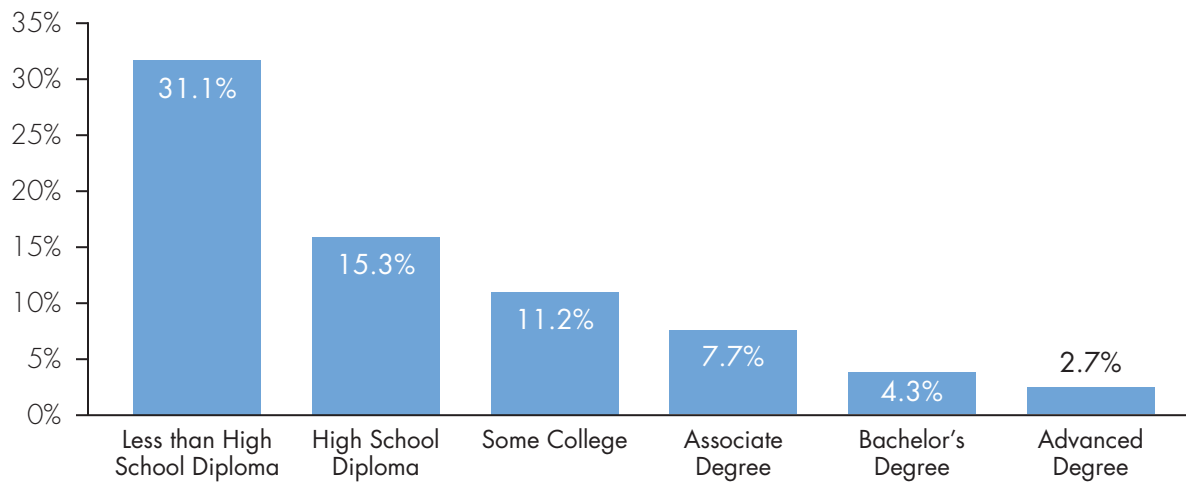
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,511,493.

Fringe Benefits

Earnings are not the only form of compensation derived from work. Other forms of work compensation are not as readily measured, though. To the extent that fringe benefits from employment are measured, they are positively correlated with college attainment in a manner similar to the effect on earnings. Thus, the college earnings premium shown in Figures 1 and 4 significantly understates the college premium in total work compensation.

Health Insurance

The value of employer-provided health insurance can be a significant part of total work compensation. The value of employer contributions for individuals' health insurance is measured in the March Social and Economic Supplement of Current Population Survey. These data in 2012 for working-age adults indicate that the average annual value of employer health insurance contributions, when there is an employer contribution, is $6,064. This is 9.4 percent as large as the annual earnings of the workers in this sample with employer contributions for health insurance.

Figure 6 shows the average value of employer health insurance contributions, including instances when there is no contribution, for working-age adults in 2012. As in the case of earnings, the value rises significantly with college attainment: from less than $1,900 for high school graduates with no college, to more than $3,200 for bachelor's graduates, to nearly $4,000 for those with advanced degrees.

Figure 6
Average Annual Employer Contribution for Health Insurance
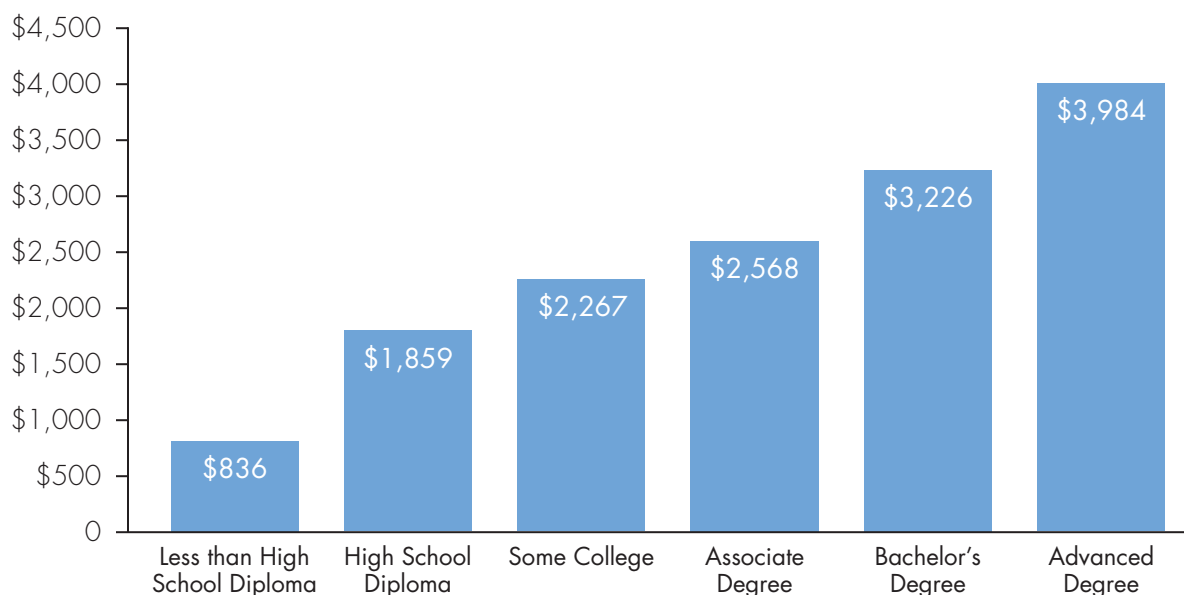
Source: Author's calculations using the March 2013 Social and Economic Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 99,742.

Figure 7
Health Insurance through Employment
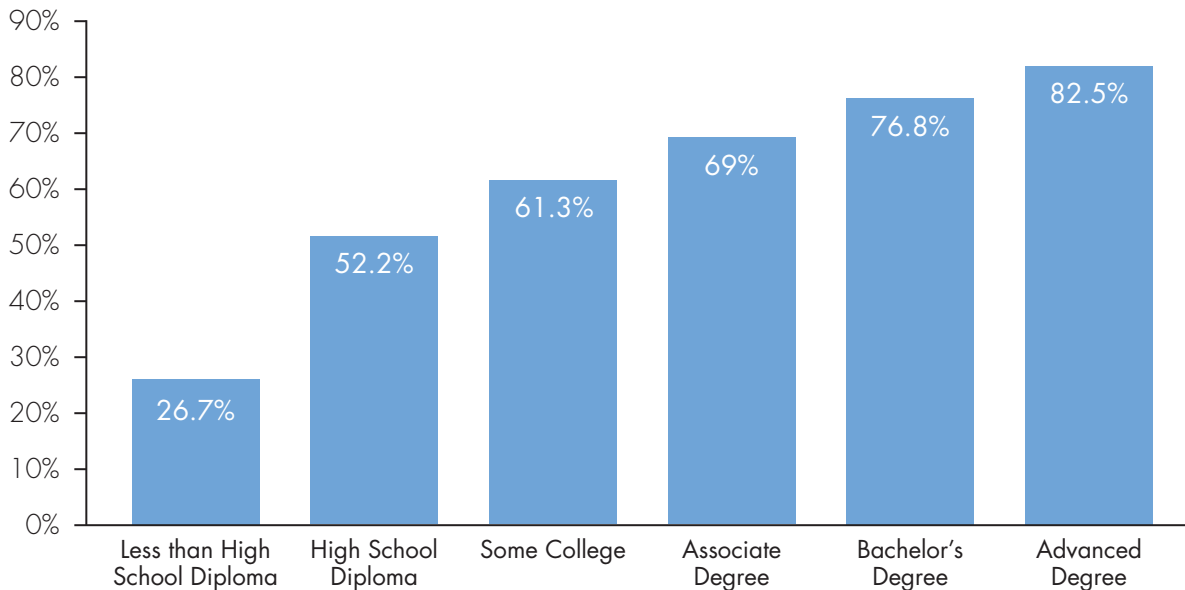
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

The college premium in the health insurance fringe benefit occurs along three dimensions. Employment rises with college attainment (see Figure 12). For those employed, health insurance is more likely to be included as an employment fringe benefit for those with more education. And the average value of the employer contribution to health insurance increases with education attainment. For those having health insurance as an employment fringe benefit, the average value rises from $5,665 for high school graduates, to $6,234 for those with bachelor's degrees, to $6,828 for those with advanced degrees.

Figure 7 shows the proportions of working-age individuals with health insurance through employment. These proportions are derived from the 2012 American Community Survey. About 52 percent of high school graduates with no college had health insurance through work, compared to 69 percent for those with associate degrees and more than 82 percent for those with advanced degrees.

The proportion of working-age individuals without health insurance from any source (including Medicaid and Medicare) is illustrated in Figure 8. Even when including Medicaid, 24.5 percent of high school graduates with no college had no health insurance in 2012, while about 9 percent of bachelor's graduates without advanced degrees were uninsured, and less than 5 percent of those holding graduate degrees were uninsured. The Affordable Care Act should eliminate most of this substantial difference in lack of health insurance in the future, though.
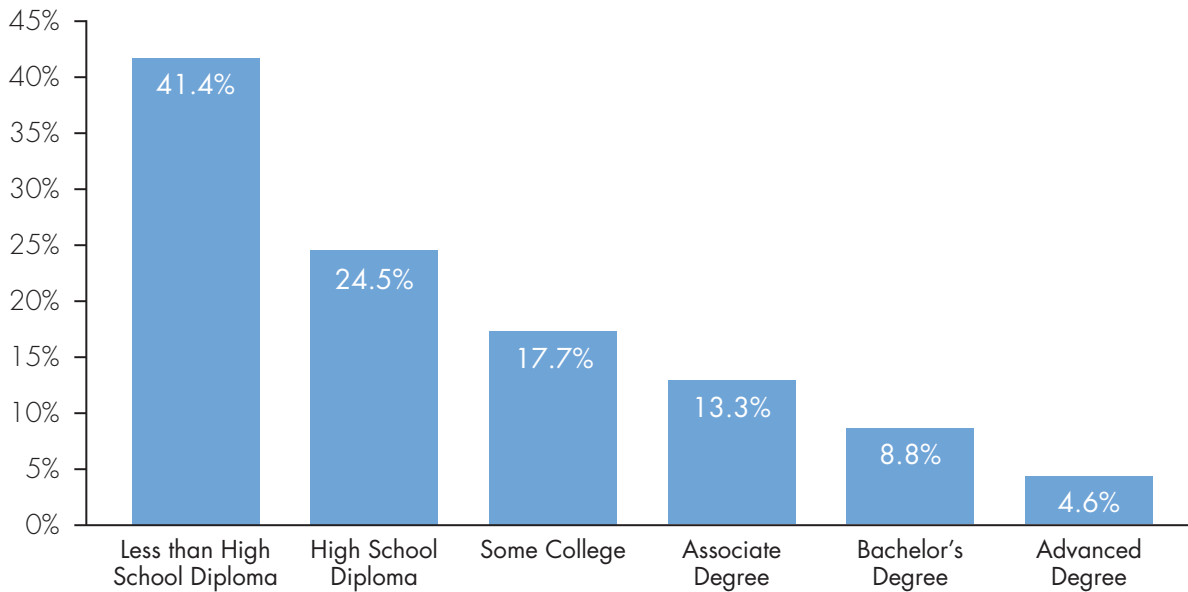
Figure 8
No Health Insurance

Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

Figure 9
Retirement Plan through Employment
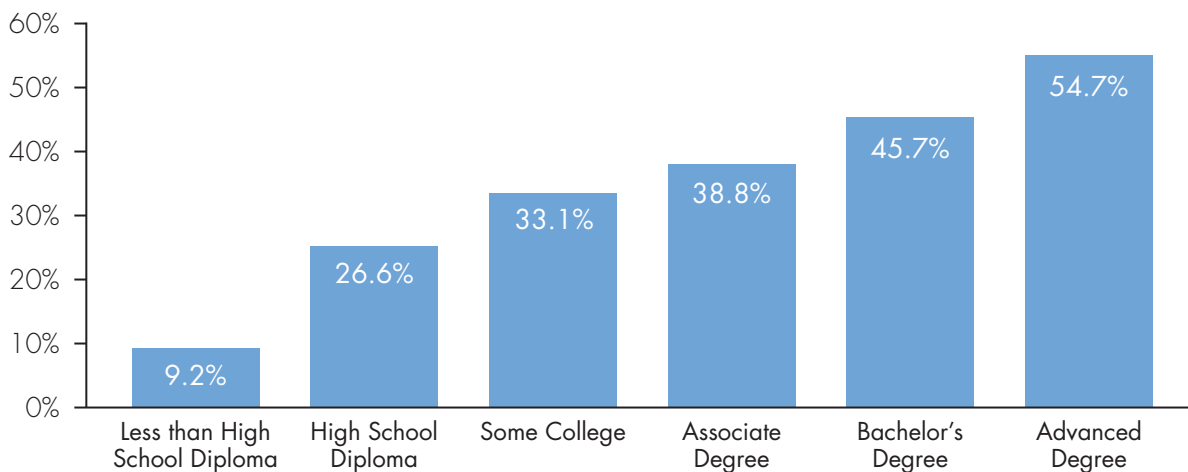
Source: Author's calculations using the March 2013 Social and Economic Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 99,742.

Retirement Plans

Employer contributions to retirement plans are another significant part of total work compensation. Although data on the value of employer contributions to retirement plans are not available, there are data that indicate this fringe benefit increases significantly with college attainment.

The March Social and Economic Supplement of Current Population Survey has information on individuals with retirement plans through employment. These data are summarized in Figure 9. In 2012, only about 9 percent of high school dropouts and 27 percent of high school graduates with no college had retirement plans through work, compared to 39 percent for holders of associate degrees, 46 percent for holders of bachelor's degrees, and 55 percent for holders of advanced degrees.

The American Community Survey has information on individuals' retirement income (not including Social Security benefits), and presumably at least part of this income was from employer contributions, on average. Figure 10 shows average annual retirement income for individuals age 62 to 79. For high school graduates with no college, average retirement income was a little less than $4,500 per year. For those with bachelor's degrees as their highest education qualification, average retirement income was about $10,700 per year. For holders of advanced degrees it was $18,100 annually. Thus, the lifetime college earnings premium shown in Figure 4 understates the lifetime college income premium.

Moreover, Figure 10 understates the differences in retirement income across college attainment because the data include all persons age 62 to 79, including those not yet retired. As will be discussed shortly, average retirement age increases with college attainment.

Figure 10
## Annual Retirement Income
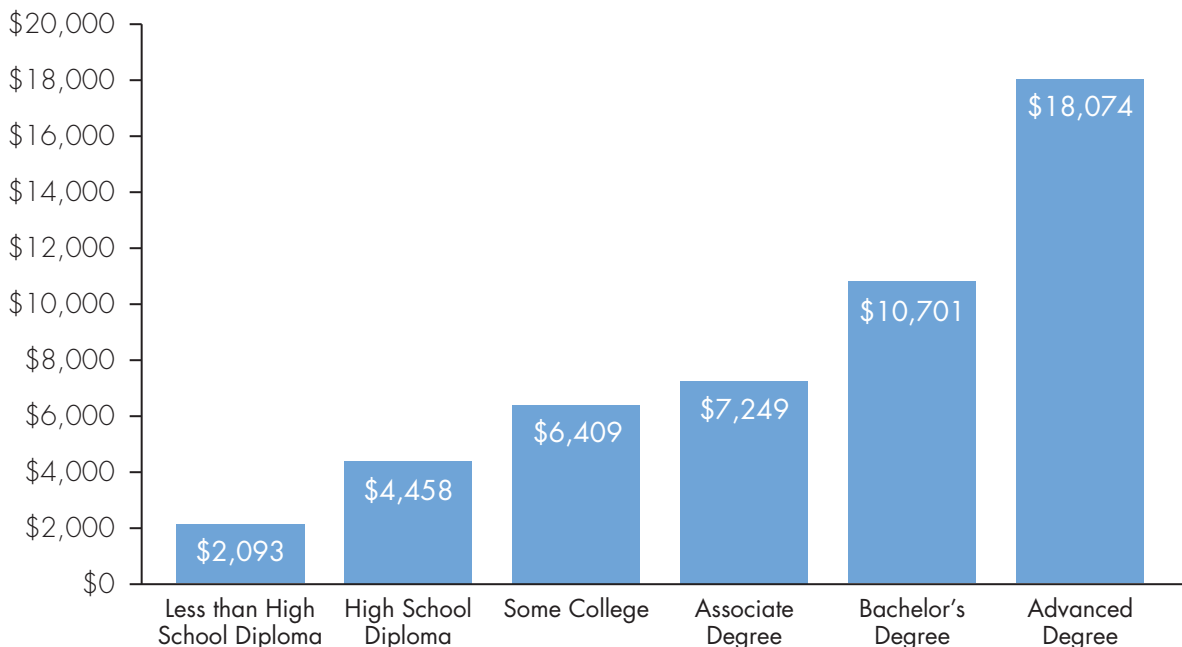
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 62-79, N = 511,243.

Job Safety

Data that include both job safety and education attainment are also not available, but the May 2012 Disability Supplement of the Current Population Survey has data on individuals receiving workers' compensation within the past year. Figure 11 shows the relationship between college attainment and on-the-job injuries as measured by receiving workers' compensation within the previous year.

The proportion of individuals receiving workers' compensation is not statistically different among high school dropouts, high school graduates, some college, and associate graduates: 0.9 percent, 1.1 percent, 0.9 percent and 0.9 percent, respectively. The proportion is significantly lower, though, for bachelor's degrees and advanced degrees: 0.5 percent and 0.4 percent, respectively. Moreover, these differences slightly understate the relationship between college attainment and job safety because employment increases with college attainment. The differences across education attainment would be slightly more pronounced if the measure of on-the-job injuries was receiving workers' compensation relative to employment.

Figure 11
Received Workers' Compensation within the Past Year
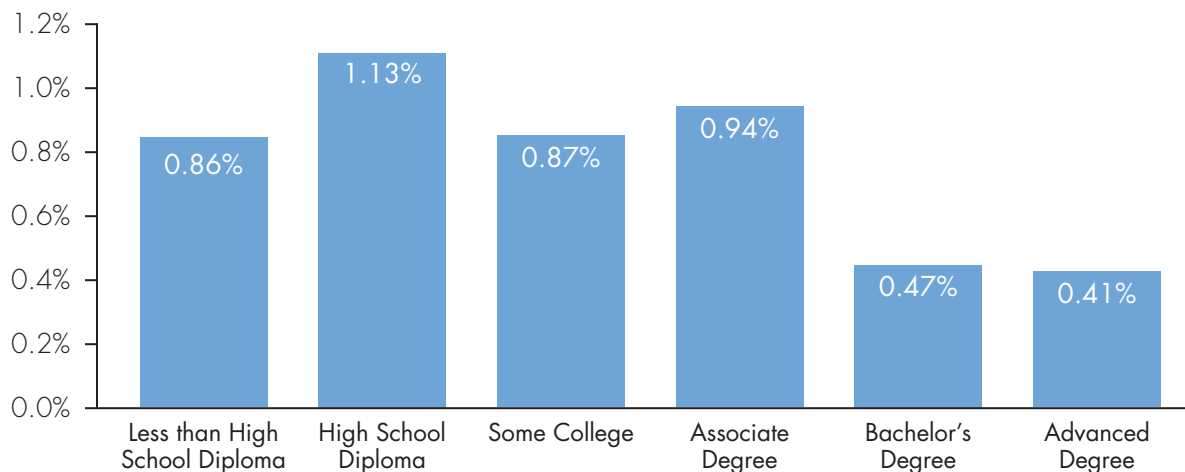
Source: Author's calculations using the May 2012 Disability Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 60,056.

Job Prestige

Although it is difficult to quantify its importance, prestige matters. Both education and job choices are often influenced by prestige factors. Job prestige is a type of fringe benefit. Moreover, jobs with greater prestige generally require higher education credentials.

Oreopoulos and Salvanes (2011) investigated the correlation between education attainment and occupational prestige using two datasets. First they examined "work-value descriptors" in the

Occupational Information Network sponsored by the U.S. Department of Labor. They illustrated the correlation between the average "achievement" measure (i.e., the sense of accomplishment from work) and education attainment. On a seven-point scale with seven being the highest, high school graduates with no college had an average score of about 3.7. Those with some college (including associate degrees) but less than a bachelor's degree had an average score of about 4.1. Those with a bachelor's degree or more had an average score of about 4.8. They report the same pattern for the other work-value variables in the data: "independence" (work autonomy and opportunity for creativity), "relationships" (social interaction on the job), "recognition" (both within and outside the firm), "support" (from managers and co-workers), and "working conditions" (including job security).

Oreopoulos and Salvanes (2011) also investigated the relationship between education attainment and an "occupational prestige score" in the U.S. General Social Surveys. The occupational prestige score is based on respondents' subjective rankings of occupations. It ranged from 17 (miscellaneous food preparation occupations) to 86 (physicians). The average score for high school graduates with no college was about 38. For those with some college (including associate degrees) but less than a bachelor's degree the average was 43. For bachelor's degree or more the average was about 53.

Employment

Employment (including self-employment) increases significantly with college attainment. This is illustrated in Figure 12. This chart uses data for working-age individuals in the 2012 American Community Survey. The proportion of this population that is employed rises steadily with education attainment, from 64.5 percent for high school graduates with no college to 84 percent for those with advanced degrees.

The strong positive correlation between college attainment and employment is due to college attainment having both a strong negative correlation with unemployment and a strong positive correlation with labor force participation.

Figure 12
Employed
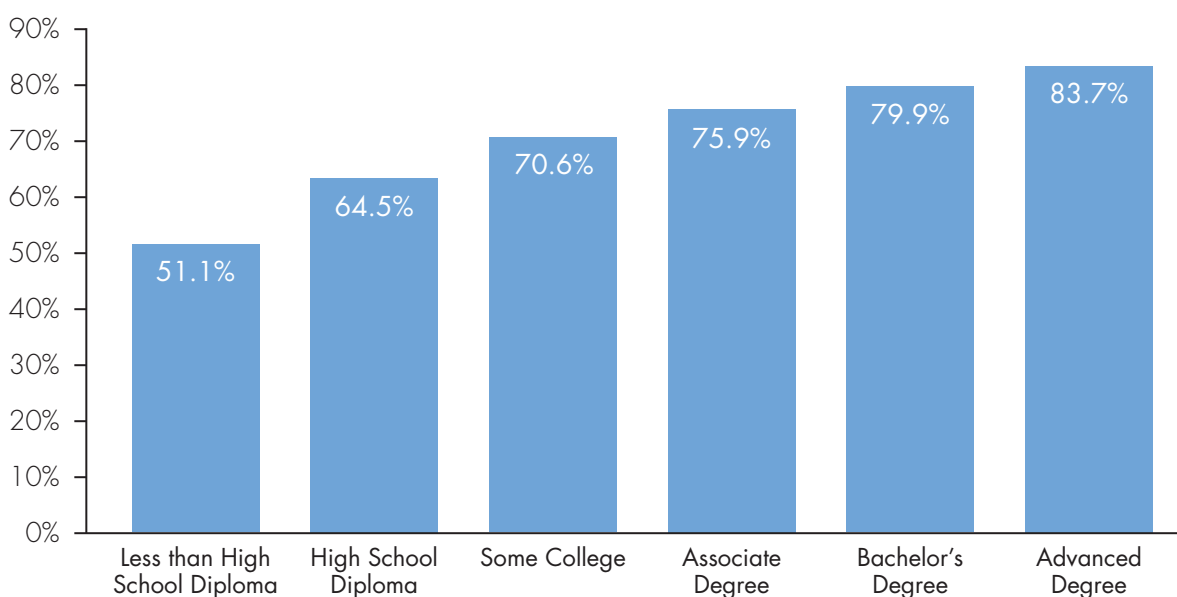
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

Unemployment

Figure 13 shows the relationship between college attainment and the unemployment rate calculated from 2012 American Community Survey data for individuals age 27 to 66. The unemployment rate for those with bachelor's degrees as their highest education qualification was less than half of that for those with high school diplomas and no college. The unemployment rate for holders of graduate degrees was less than a third of that for high school graduates with no college.

Figure 13
Unemployment Rate

Bar chart showing unemployment rate by education level: Less than High School Diploma 13.6%, High School Diploma 9.6%, Some College 7.8%, Associate Degree 6.0%, Bachelor's Degree 4.4%, Advanced Degree 3.1%.

Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

Figure 14
Trend in the Unemployment Rate

Line chart showing trend in unemployment rate 2000–2012 by education level: Less than High School Diploma, High School Diploma, Some Clollege, Associate Degree, Bachelor's Degree, Advanced Degree.
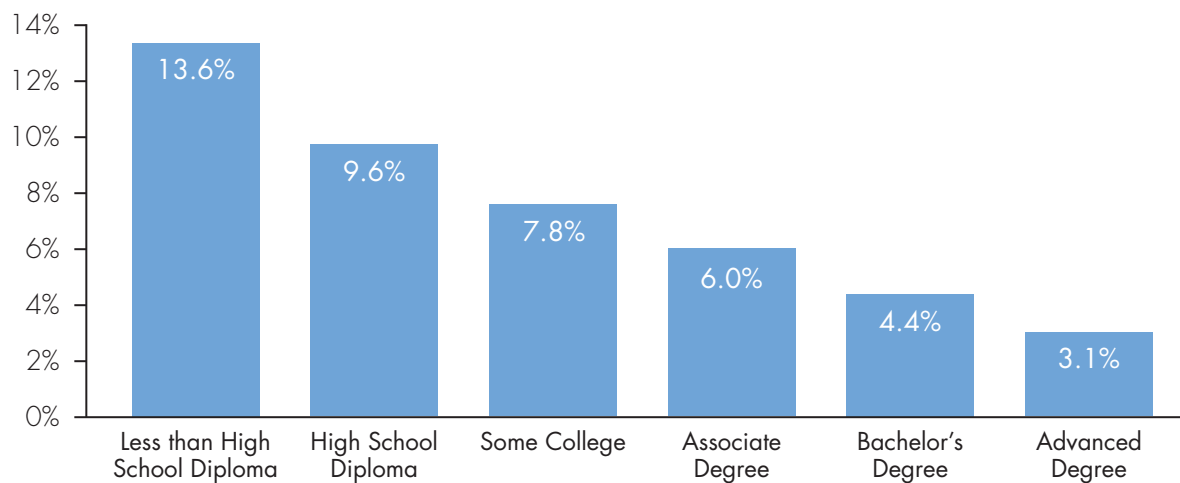
Source: Author's calculations using the 2000-2012 American Community Survey Public Use Microdata Samples, ages 27-66 and not enrolled in college, N = 10,957,743.

The relationship between college education and employment in 2012 is not unique to the recent period of severe economic distress. The trend in unemployment rates derived from American Community Survey data (for those with the ages of 27 to 66 and not in college) since 2000 is shown in Figure 14. Relative differences in unemployment rates across education credentials have been roughly stable. The negative relationship between education and employment is also not unique to the U.S. (see Trostel and Walker, 2006).

Labor Force Participation

The relationship between college attainment and non-participation in the labor market is illustrated in Figure 15. The proportion of working-age adults not in the labor force falls from more than 29 percent for high school and no college, to 19 percent for associate degrees, to less than 14 percent for advanced degrees. Moreover, as in the case of unemployment, this pattern is not unique to recent U.S. history. The relative differences in non-participation rates across education credentials have also been roughly stable.

The relationship between college attainment and non-participation in the labor market shown in Figure 15 holds for both men and women, although the negative correlation is slightly stronger for men. The rate of non-participation for men falls from 22.4 percent for high school graduates to 10.1 percent for bachelor's graduates. For women, the non-participation rate falls from 35.5 percent for holders of high school diplomas to 22.3 percent for those with bachelor's degrees as their highest education qualification.

Figure 15
Not in the Labor Force

Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.
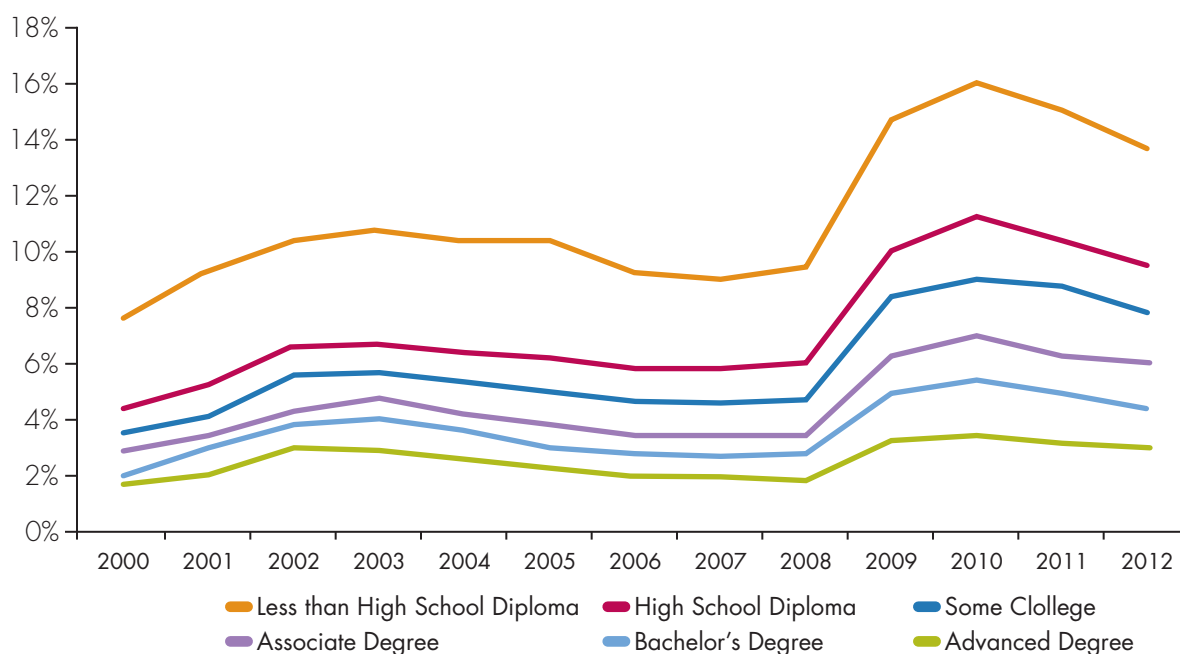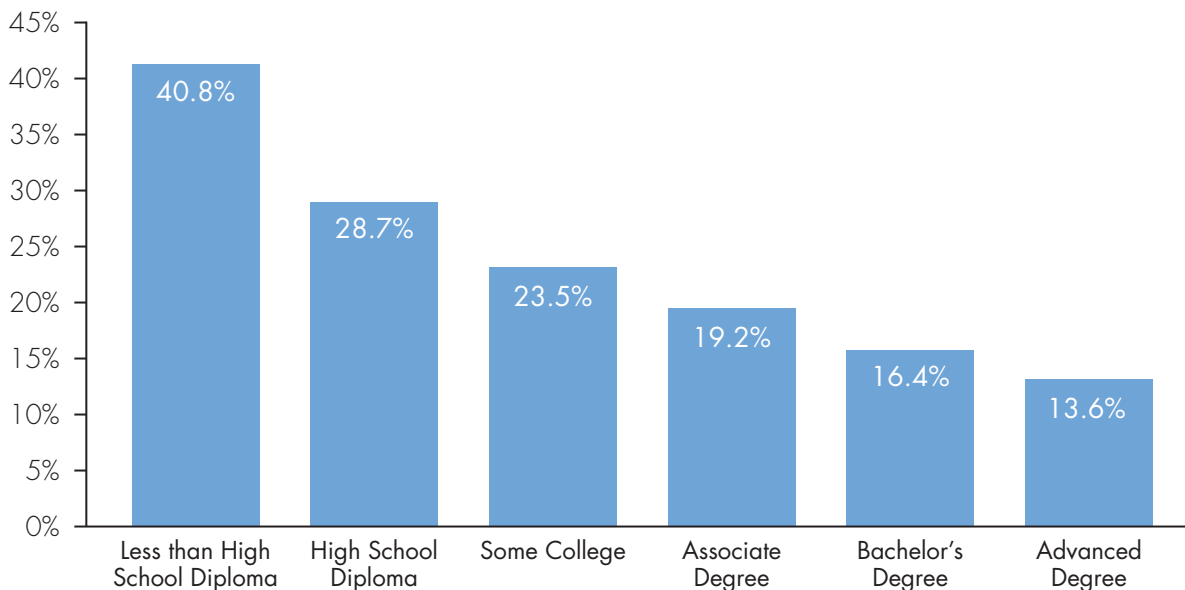
Retirement

Part of the effect of college attainment on labor force participation is through its effect on retirement. Although college attendance delays the start of full-time work, it also delays retirement. The net effect of going to college on the average length of work careers is unclear.

Demonstrating the relationship between college attainment and retirement is complicated by the difficulty in measuring retirement. Among those age 62 to 69 in the American Community Survey in 2012 who report some retirement income (including Social Security benefits), 30.1 percent also report having some earnings from work. Among those ages 62 to 69 who report having some earnings, 50.3 percent also have some retirement (including Social Security) income. For many individuals "retirement" is not a clear distinction.

One approximate measure of retirement, non-participation in the labor market among those 62 to 69, is illustrated in Figure 16. Although not being in the labor force at these ages is not necessarily being retired, retirement is the primary reason for it. Non-participation in the labor market illustrated for this age group is substantially higher than for ages 27 to 66 shown in Figure 15 (the overall rate of non-participation in the labor market for age 62 to 69 is 61.0 percent, compared to 24.3 percent for age 27 to 66). As shown in Figure 16, this approximate measure of retirement falls from 67 percent for high school graduates with no college to 53 percent for bachelor's graduates without advanced degrees. The negative correlation between retirement and college attainment is somewhat more pronounced for men than women, although the negative correlation is strong for women too.

Figure 16
Not in the Labor Force for Ages 62–69
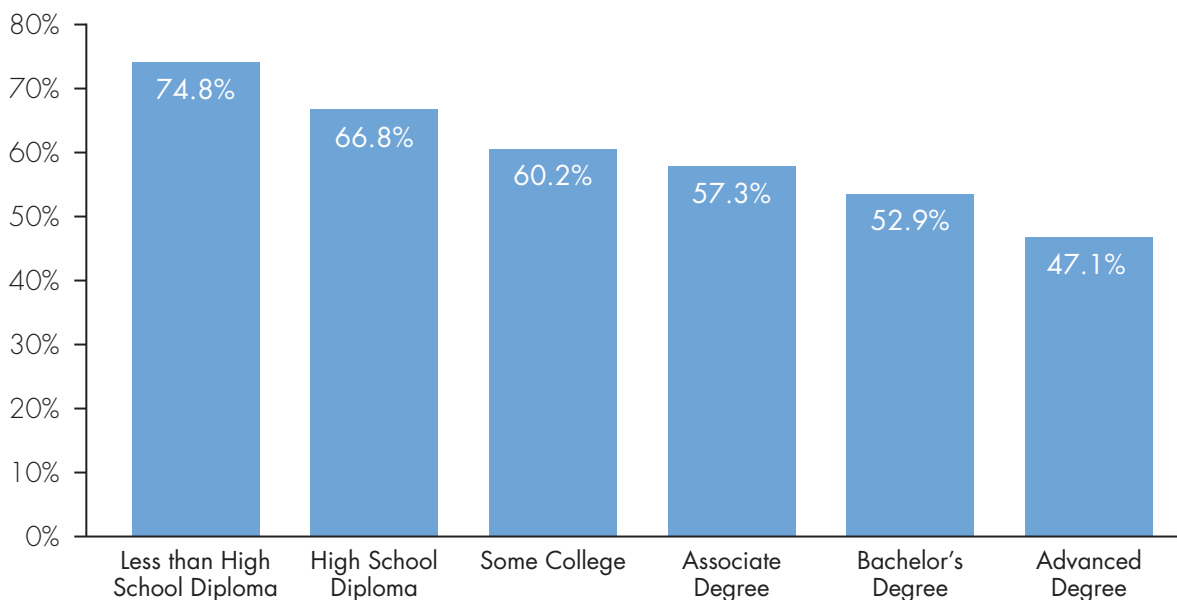
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, N = 288,984.

Figure 17
"Retired" for Ages 62–69
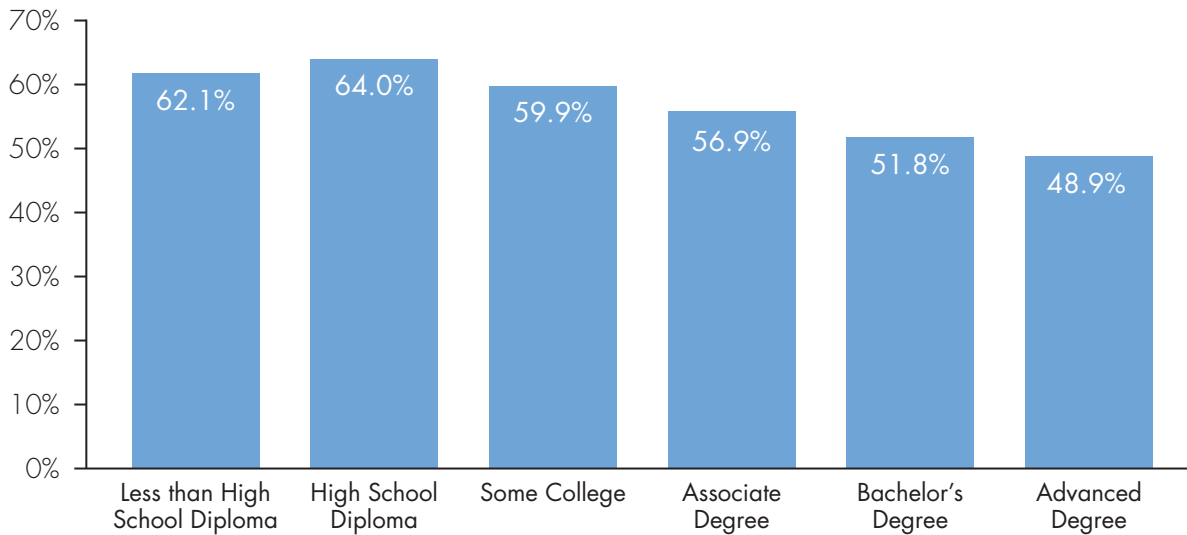
Category	Percentage
Less than High School Diploma	62.1%
High School Diploma	64.0%
Some College	59.9%
Associate Degree	56.9%
Bachelor's Degree	51.8%
Advanced Degree	48.9%

Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, N = 291,248.

Figure 17 shows another approximate measure of retirement. In this measure a person is counted as "retired" if her/his retirement income (including Social Security benefits) exceeds their earnings from work. Both its level and correlation with college attainment are similar to the not-in-the-labor-force measure shown in Figure 16 (the overall retired rate for age 62 to 69 using this measure is 58.4 percent, compared to 61.0 percent for the not-in-the-labor-force measure). As illustrated in Figure 17, this approximate measure of retirement falls from 64 percent for high school graduates with no college to 52 percent for bachelor's graduates without advanced degrees.

Health

A substantial literature has established a strong, and increasing, positive link between education attainment and health, often referred to as the education-health gradient. Some recent contributions summarizing this large literature are Grossman (2006), Groot and Massen van den Brink (2007), Cutler and Lleras-Muney (2008, 2010), Furnée, Groot and Massen van den Brink (2008), Conti, Heckman and Urzua (2010), Eide and Showalter (2011), Lochner (2011), and Clark and Royer (2013). Moreover, Cutler and Lleras-Muney (2008) contend that the value of the health benefits from education is about half as large as the earnings benefit of education. Groot and Maassen van den Brink (2007) reach a similar conclusion.

Figure 18 illustrates the magnitude of the relationship between college attainment and self-reported health. This chart is derived using data on individuals age 27 to 66 in the 2013 March Social and Economic Supplement of Current Population Survey. For those with bachelor's degrees but not advanced degrees, 73 percent report their health to be very good or excellent, compared to 50.5 percent for high school graduates without college. The relative difference is even stronger for those reporting their health to be excellent: 35 percent for those with bachelor's degrees but not advanced degrees compared to 19.5 percent for high school graduates with no college.

Figure 18
Self-Reported Health
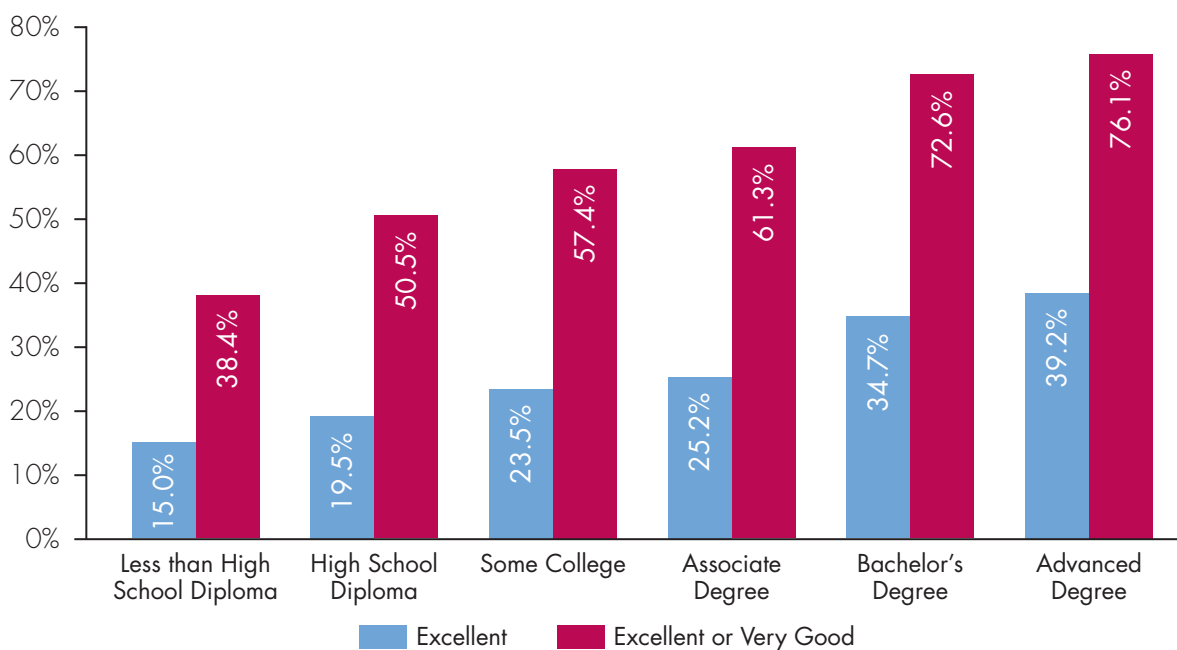
Source: Author's calculations using the March 2013 Social and Economic Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 99,742.

Figure 19
Disability
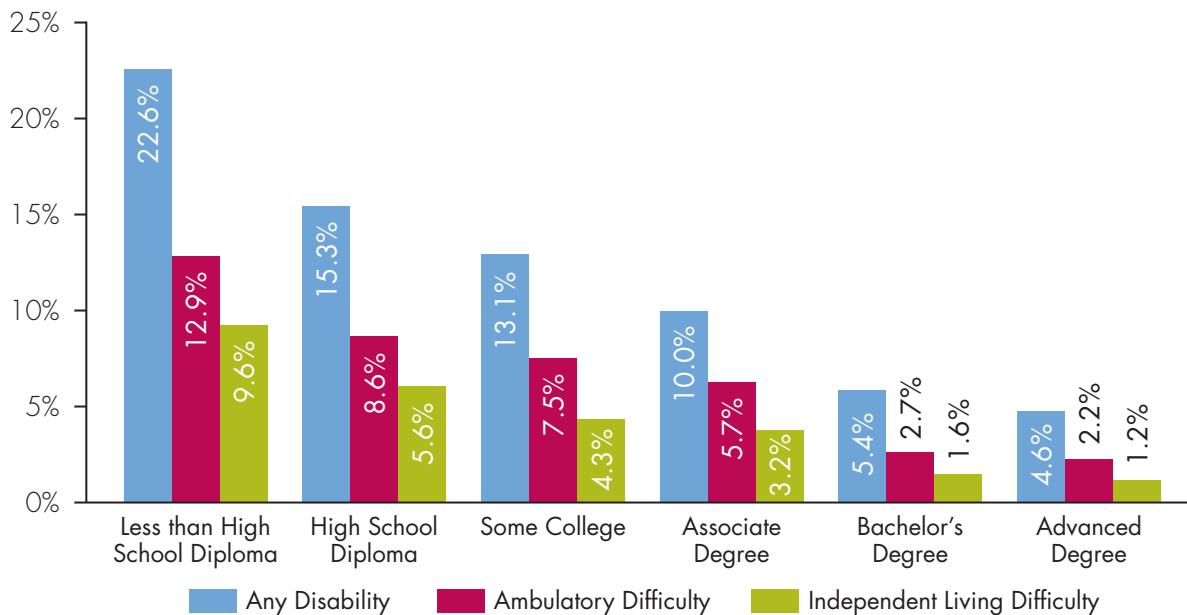
	Less than High School Diploma	High School Diploma	Some College	Associate Degree	Bachelor's Degree	Advanced Degree
Any Disability	22.6%	15.3%	13.1%	10.0%	5.4%	4.6%
Ambulatory Difficulty	12.9%	8.6%	7.5%	5.7%	2.7%	2.2%
Independent Living Difficulty	9.6%	5.6%	4.3%	3.2%	1.6%	1.2%

Disability

Disabilities are at the opposite end of the health spectrum and, consistent with the evidence on good health, they are strongly inversely correlated with college education. The American Community Survey has several questions about disabilities. Figure 19 summarizes three of these measures for individuals ages 27 to 66.

The first column in Figure 19 shows the percentage of the working-age population reporting some type of disability. The proportion with a disability falls from 15 percent for those with high school diplomas and no college to 10 percent for holders of associate degrees to about 5 percent for holders of bachelor's degrees.

The severity of disabilities evidently also declines with college attainment. The relative difference across college attainment categories is slightly larger in the second column in Figure 19. The proportion of the working-age population reporting ambulatory difficulties falls from 8.6 percent for high school graduates with no college to 2.7 percent for those with bachelor's degrees as their highest education qualification. The relative difference across college credentials is stronger still in the third column. The proportion reporting difficulty living independently falls 5.6 percent for high school graduates without college to 1.6 percent for bachelor's graduates without advanced degrees.

Considering that the proportions in Figure 19 are derived from a sample of adults under age 67,

the magnitudes of these differences are astounding. More than one out of every 12 non-elderly high school graduates without college reported difficulty walking, compared to one out of every 38 non-elderly bachelor's graduates without advanced degrees. One out of every 18 non-elderly high school graduates reported difficulty living independently, compared to one out of every 63 of those with bachelor's degrees as their highest education qualification.

Although occupational differences in job safety probably contribute to the correlation between disabilities and college attainment, it is implausible that they could explain most of it. Recall from Figure 11 that the likelihood of receiving workers' compensation is significantly lower only for those with bachelor's or advanced degrees. If receiving workers' compensation reasonably measures differences in risks of job injuries, then the correlation shown in Figure 11 is not strong enough to explain the disability correlations shown in Figure 19. Differences in health behaviors, which are discussed below, may be a more important factor explaining the large differences in disabilities. The underlying effects driving the link between education attainment and the incidence of severe disability is an area crying out for in-depth exploration. The incidence of morbid obesity might be one the key factors.

Life Expectancy

The strong negative relationship between education attainment and health problems is also revealed in early mortality. Indeed, there is a large literature on the relationship between education and mortality / life expectancy. Some recent contributions to this literature are Lleras-Muney (2005), Meara, Richards and Cutler (2008), Hummer and Lariscy (2011), Eide and Showalter (2011), Everett, Rehkopf and Rogers (2013), and Clark and Royer (2013).

Hummer and Lariscy (2011) examined U.S. data on 831,820 adults between ages 25 and 84 from 1986 through 2002. They found that mortality rate for those with some college or an associate degree was 7 percent lower than the rate for high school graduates with no college. The mortality rate for those with bachelor's degrees as their highest education qualification was 25 percent lower than for high school graduates without college. The mortality rate was lower still for those with advanced degrees (measured as 17 or more years of completed education): 33 percent less than for high school graduates without college.

Hummer and Lariscy (2011) further show that college attainment is inversely related to all broad categories of mortality, but particularly for the most preventable causes. To be specific, the strongest negative effects of college education on mortality are for diabetes and lung cancer, followed by respiratory disease and external causes (homicide, suicide and accidents).

Meara, Richards and Cutler (2008) show similar results but in terms of life expectancy. They estimated life expectancies at age 25 using data from the Public Use Microdata Sample of the 2000 U.S. Census (7.8 million observations). Life expectancy (at age 25 in 2000) for those with at least some college (including those earning degrees) was seven years longer than for those who never attended college (including high school dropouts): 81.6 compared to 74.6. Seven years!
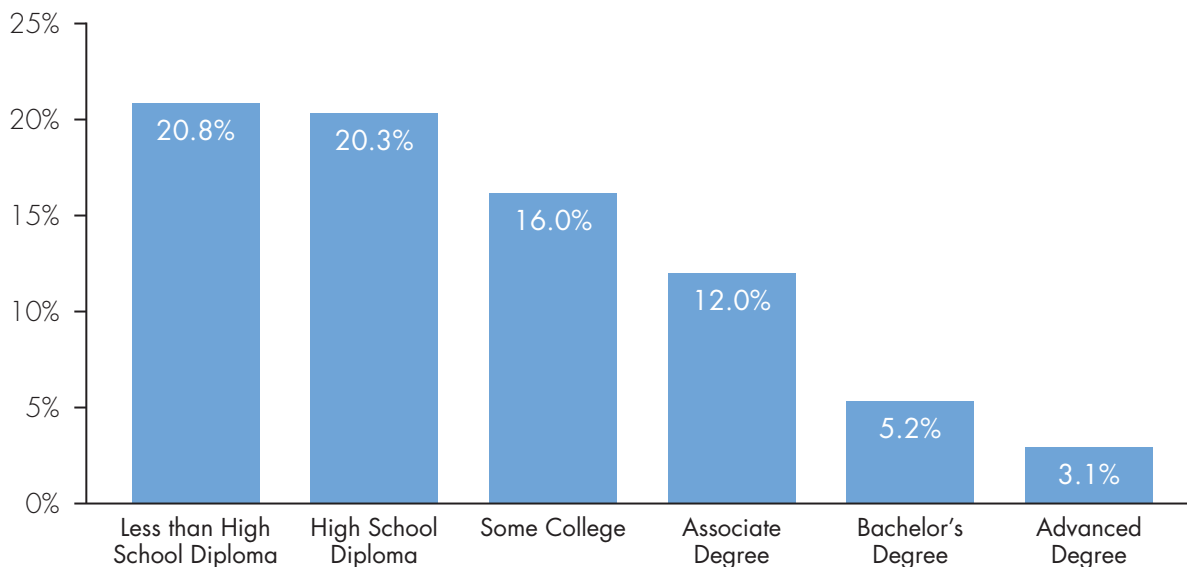
Health Behaviors

Part of the effects of college education on health and life expectancy are due to differences in health behaviors. In other words, some health problems and early mortality are influenced by

behaviors that are influenced by education. The results in Mokdad, Marks, Stroup and Gerberding (2004) indicate that "modifiable behavioral risk factors are leading causes of mortality" in the U.S. They further demonstrate that smoking is the leading cause of death, followed closely by poor diet and physical inactivity, with alcohol a distant third. Smoking, diet, exercise, alcohol abuse and other health behaviors are strongly influenced by college attainment.

Figure 20 shows the relationship between smoking regularly and college education. It is derived for individuals ages 27 to 66 in the January 2011 Tobacco Use Supplement of the Current Population Survey. The proportion of working-age adults smoking daily falls from 20 percent of high school graduates without college, to 12 percent of holders of associate degrees, to 5 percent of those with bachelor's degrees as their highest education credential, to 3 percent of holders of graduate degrees.

Cutler and Lleras-Muney (2010) analyzed data from the National Health Interview Survey from 1990 to 2000 (about 23,000 observations). They found a strong positive relationship between education, especially college education, and exercise. They found a significant positive relationship between education and eating fruits and vegetables. They found strong negative correlations between education, particularly college education, and both obesity and heavy drinking. They showed a strong positive correlation between with education, especially college education, and seat belt use. They also found significant positive correlations with education and various types of preventive medical care.

Figure 20
## Smoke Daily

Other Private Benefits

Financial Savvy

It stands to reason that if education creates human capital and increases the productivity of work activities, then it is also likely to increase the productivity of at least some home activities. One important way that education may affect home productivity is in improved decision-making about expenditures and investments. Michael (1972) referred to this effect as efficiency in consumption. Although it is generally difficult to measure these types of effects, there is evidence indicating merit to this notion.

One important and partially measurable "home benefit" to education is financial savvy; that is, financial literacy and skill in earning income from assets and in minimizing finance charges. Reducing finance charges and costs of transactions essentially raises real income. For yet more reasons the college premium in earnings understates the college premium in real income (besides the various non-income benefits).

Average annual income from assets is reported in Figure 21. Not surprisingly, net asset income increases substantially with college attainment. Indeed, in percentage terms the college premium in net asset income is considerably larger than the college premium in earnings. Average interest, dividends and net rent of those with bachelor's degrees as their highest education qualification was 4.9 times greater than for high school graduates with no college. Net asset income of those with graduate degrees was 7.6 times greater than for high school graduates without college. Thus, the

Figure 21
Annual Income from Interest, Dividends, and Net Rent
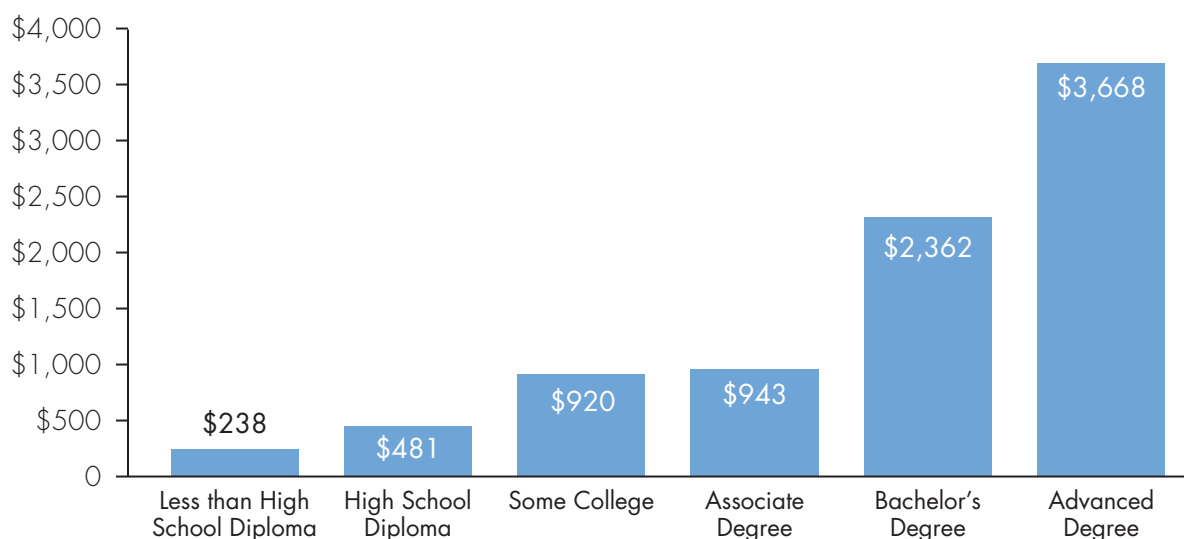
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

Figure 22
Does Not Have a Bank Account
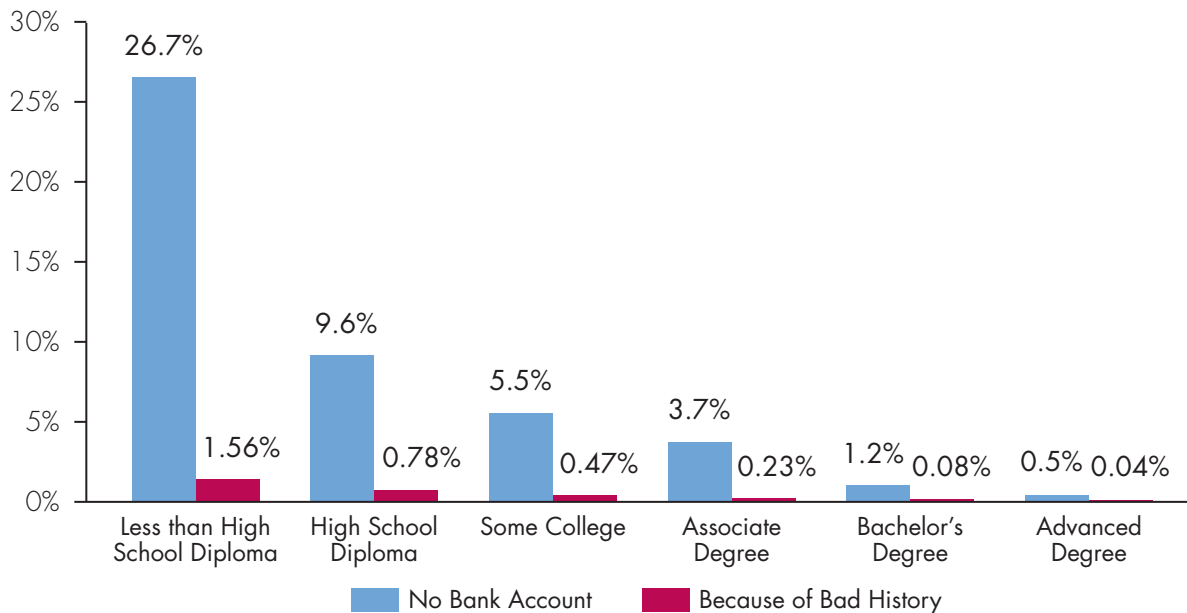
Source: Author's calculations using the June 2011 Unbanked/Underbanked Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 58,500.

college premium in total income is larger than the college premium in earnings illustrated in Figures 1 and 4. Moreover, there also appears to be a college premium in saving transactions costs.

The June 2011 Unbanked/Underbanked Supplement of the Current Population Survey has several measures which suggest that college attendance improves financial savvy and reduces transactions costs. Figure 22 shows the relationship between college education and not having a bank account. Nearly 10 percent of high school graduates without college did not have a bank account, compared to 3.7 percent of those with associate degrees and 1.2 percent of those with bachelor's degrees as their highest education qualifications.

Figure 22 also shows the percentages of working-age adults without a bank account because of a bad banking history. High school graduates without college are 9.4 times more likely to not have a bank account due to past banking problems than those with bachelor's degrees as their highest education credential.

Households without bank accounts sometimes still need banking services but are forced to purchase these services one at a time from non-bank firms. These non-bank banking services are relatively expensive per unit. Figure 23 shows the proportions of working-age adults buying two types of non-bank banking services within the past year: non-bank check-cashing services and non-bank money orders. The use of check-cashing services falls from nearly 11 percent for high school

Figure 23
Used "Expensive Banking" in the Last Year

	Less than High School Diploma	High School Diploma	Some College	Associate Degree	Bachelor's Degree	Advanced Degree
Check Cashing Service	19.4%	10.8%	8.1%	6.7%	3.3%	2.0%
Money Order	35.0%	24.0%	21.2%	18.4%	11.2%	10.6%
Either of These	41.1%	27.9%	24.3%	21.1%	13.0%	11.7%

Source: Author's calculations using the June 2011 Unbanked/Underbanked Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 54,490.
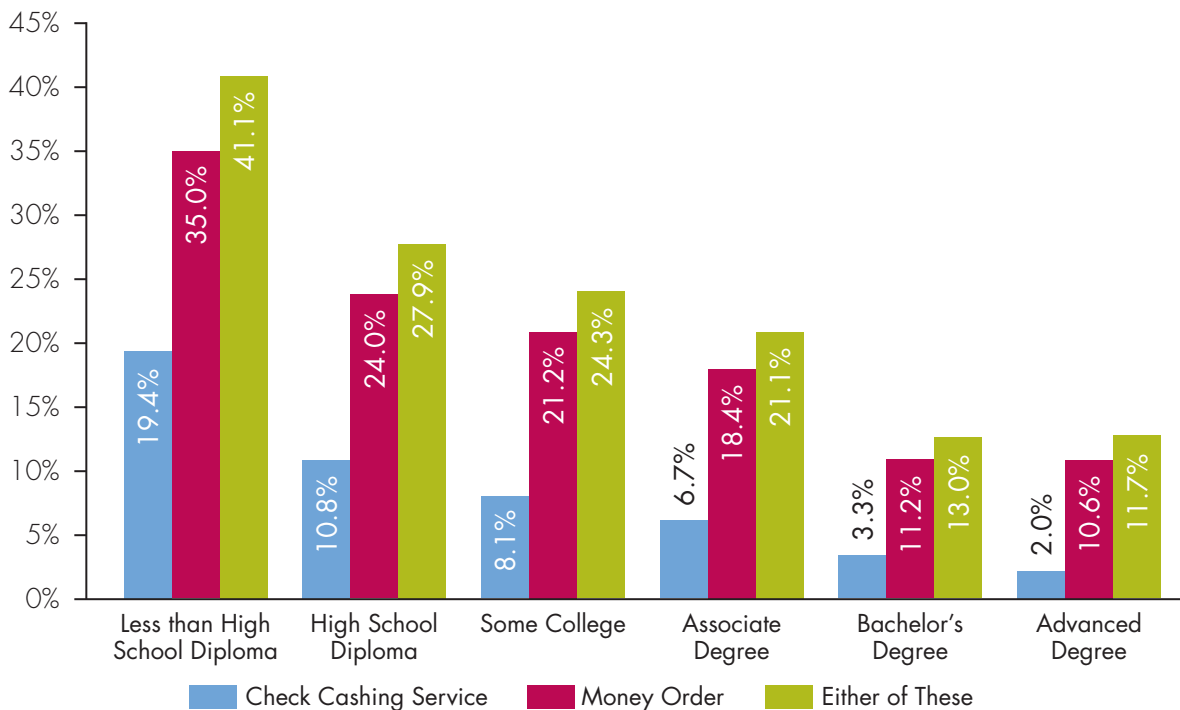
diplomas to 6.7 percent for associate degrees, 3.3 percent for bachelor's degrees, and 2.0 percent for advanced degrees. The use of non-bank money orders falls from 24 percent of high school graduates without college to 11 percent of bachelor's graduates without advanced degrees. The third column in Figure 23 shows the use of either type of "expensive banking" service during the previous year. The proportion falls from 28 percent for high school graduates without college to 13 percent for bachelor's graduates without advanced degrees.

Households without financial know-how are also sometimes forced to use relatively expensive forms of credit. Unfortunately, data on credit-card debt and interest charges are not readily available. But the June 2011 Unbanked/Underbanked Supplement of the Current Population Survey has data on some other forms of expensive credit. These are illustrated in Figure 24. It shows the percentages of the working-age population using payday loans, pawnshop loans, tax refund anticipation loans, and rent-to-own arrangements within the past year.

The use of all four of the forms of "expensive credit" shown in Figure 24 declines significantly and monotonically with education attainment. The only exception is the use of payday loans for high school graduates without college compared to those with some college but no degree and those with associate degrees as their highest education credential. The differences in these proportions using

Figure 24
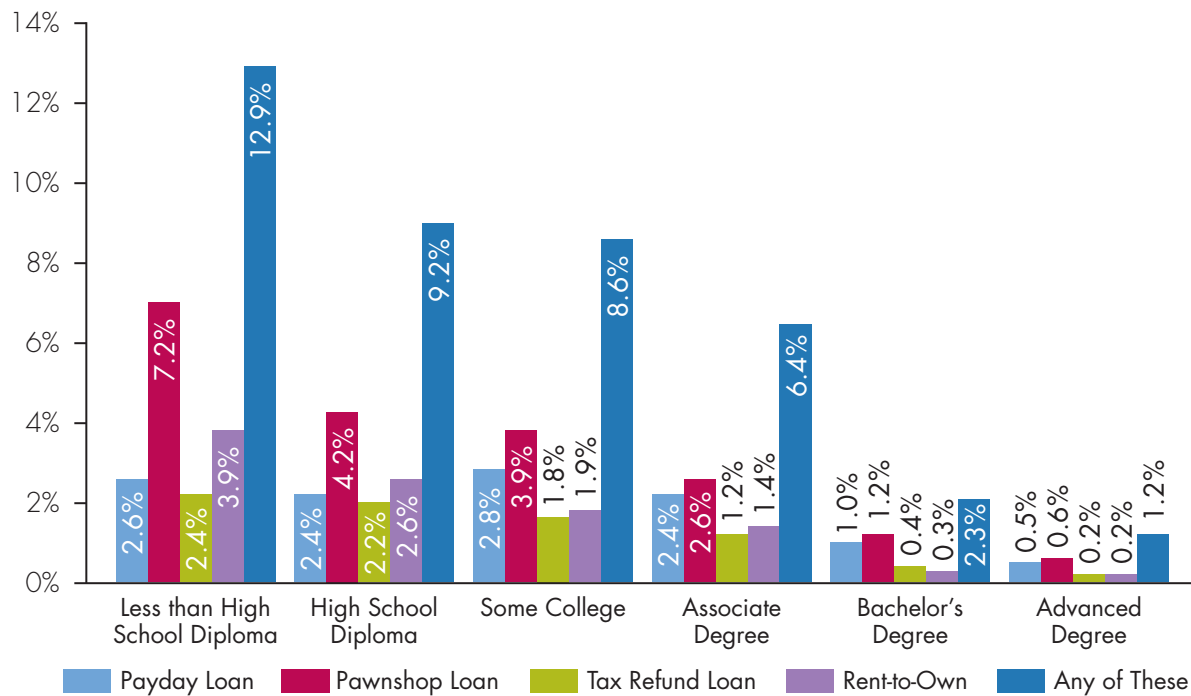## Used "Expensive Credit" in the Last Year

Source: Author's calculations using the June 2011 Unbanked/Underbanked Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 57,233.

payday loans are not statistically significant. Moreover, this exception to the otherwise monotonically and significantly decreasing relationship between the use of expensive credit and education attainment is probably due to the increasing relationship between the probability of having a payday and education attainment. As shown in Figure 12, compared to high school graduates with no college, those with some college but no degree are 6.1 percentage points more likely to be employed, and those with associate degrees as their highest schooling credential are 11.4 percent more likely to be employed.

The last column in Figure 24 shows the use of any of the four forms of expensive credit during the previous year. The proportion using one or more of these types of credit falls from 9.2 percent for high school graduates without college to 6.4 percent for associate degrees, 2.3 percent for bachelor's graduates, and 1.2 percent for advanced degrees.

Reduction in Incarceration

Incarceration rates are estimated by merging data from the 2004 Survey of Inmates in State Correctional Facilities, the 2004 Survey of Inmates in Federal Correctional Facilities, the 2002 Survey of Inmates in Local Jails, and the 2004 American Community Survey. The three datasets on incarceration are from the U.S. Bureau of Justice Statistics and, unfortunately, are the most recent available. Still, this is an update and slight refinement of the widely cited report by Harlow (2003).

Figure 25
Incarceration Rate
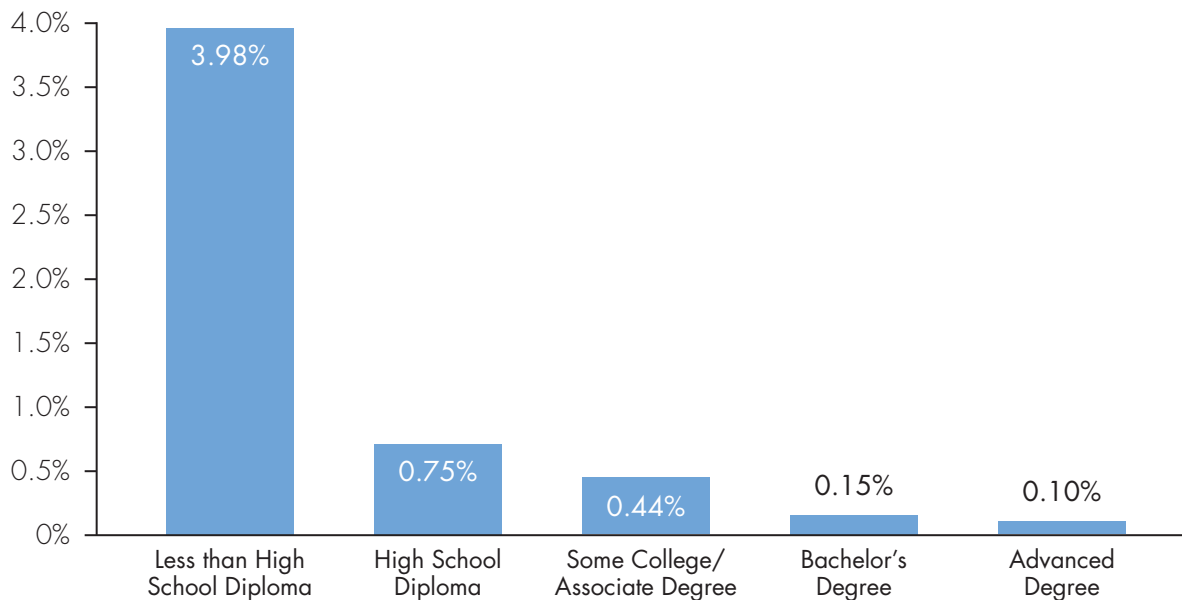
Source: Author's estimates using data from the 2004 Survey of Inmates in State Correctional Facilities, the 2004 Survey of Inmates in Federal Correctional Facilities, the 2002 Survey of Inmates in Local Jails, and the 2004 American Community Survey, ages 27-66.

The proportion of those ages 27 to 66 in prison or jail in 2004 is shown in Figure 25. The incarceration rate of high school dropouts is an incredible 4.0 percent. The proportion of working-age adults incarcerated is 0.75 percent for high school graduates with no college. The education attainment measure in the prisoner data does not distinguish between associate degrees and some college. Their combined incarceration rate is 0.44 percent. The incarceration rate of bachelor's graduates without advanced degrees, 0.15 percent, is five times less than for high school graduates without college.

The dramatic correlation between education attainment and the probability of incarceration appears to have an important role in explaining the large racial disparities in imprisonment rates. African Americans and Native Americans are disproportionately incarcerated. An initial exploration into the data suggests that about half of these racial differences in imprisonment rates can be explained by differences in education attainment. Hispanics are also disproportionately represented in the U.S. prison population to a lesser extent than African Americans and Native Americans. But this appears to be entirely due to their relatively low average level of education attainment. After controlling or education attainment, Hispanics are no more likely than the rest of the U.S. population to be incarcerated.
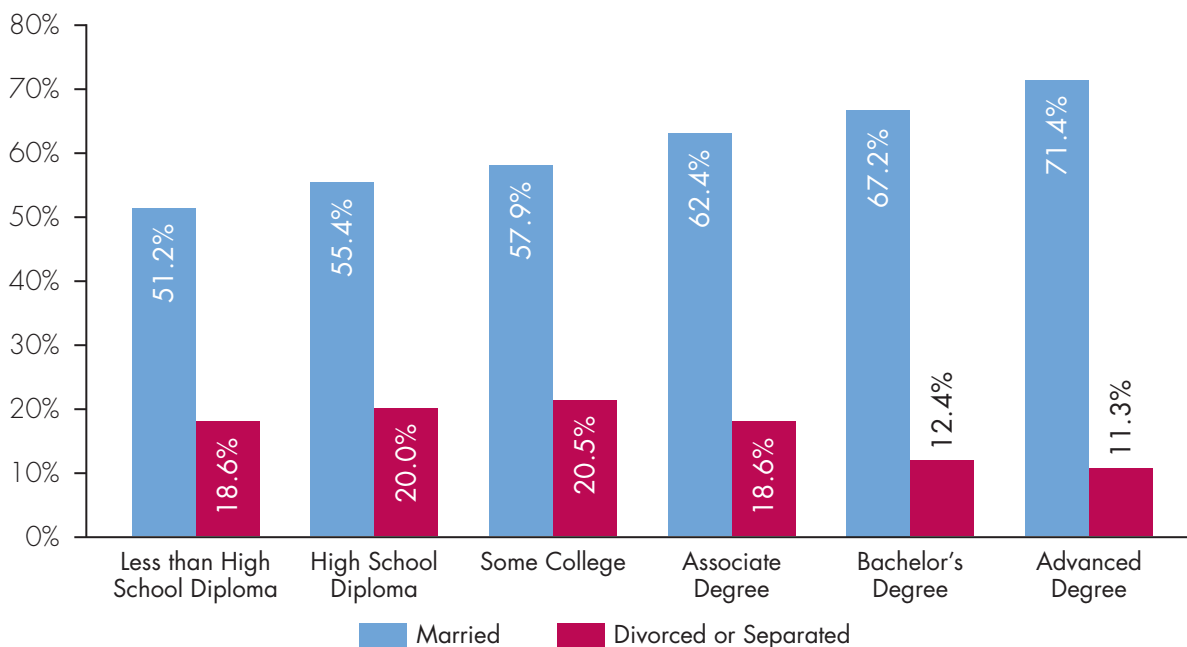
Marriage

Perhaps surprisingly, successful marriages are positively correlated with college attainment. This is illustrated in Figure 26 which is derived from the 2012 American Community Survey for individuals age 27 to 66. The married percentage increases significantly with college attainment, rising from 55

percent for high school graduates without college to 62 percent for associate graduates, 67 percent for bachelor's graduates, and 71 percent for advanced graduates.

The relationship been divorced/separated and education attainment is generally, but not completely, opposite of the relationship between being married and education attainment. The married percentage rises monotonically with education attainment, while the divorced/separated percentage falls with education attainment only for college degrees. The proportion divorced or separated is the highest for those with some college but no degree, followed by closely by high school graduates never attending college. Although the difference between these divorced/separated percentages is small, it is statistically significant because the sample is so large. The divorced/separated proportion is the same for high school dropouts and holders of associate degrees and is slightly lower than the proportion for high school graduates without college. The substantial difference, though, is between those with associate degrees and bachelor's degrees as their highest education qualifications. This finding is consistent with the results reported in Aughinbaugh, Robles and Sun (2013) using a different dataset. For further discussion on the interesting notable difference between the marriage and divorced/separated patterns across education levels see, for example, Stevenson and Wolfers (2007).

The divorced/separated pattern across levels of education attainment is also observed in the number of marriages. Figure 27 shows the number of marriages (upper truncated at three) for those ever married. Those with some college but without degrees have the highest number of marriages if ever married, again followed closely by high school graduates without college. Although the difference

Figure 26
Marital Status

Bar chart showing marital status by education level:

Education Level	Married	Divorced or Separated
Less than High School Diploma	51.2%	18.6%
High School Diploma	55.4%	20.0%
Some College	57.9%	20.5%
Associate Degree	62.4%	18.6%
Bachelor's Degree	67.2%	12.4%
Advanced Degree	71.4%	11.3%

Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,546,287.

Figure 27
Times Married
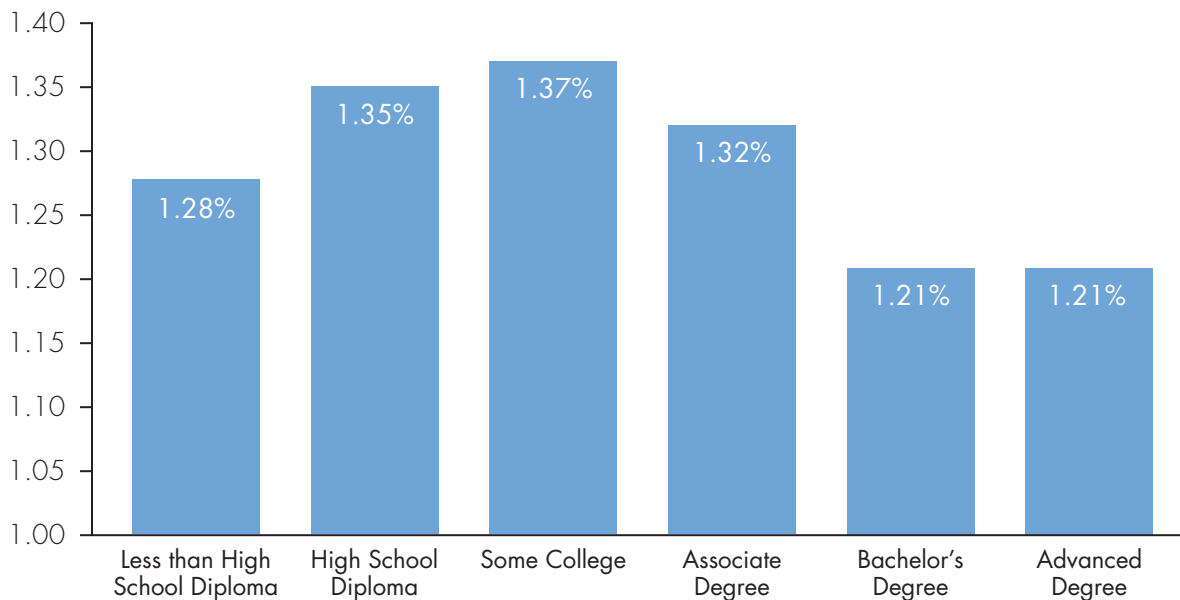
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,271,167.

is small, it is statistically significant. But the substantial difference across levels of education is again between those with associate degrees and those with bachelor's degrees.

The finding that those with some college experience but no degree have the highest rate of unsuccessful marriages is suggestive that the observed correlation between education attainment and successful marriages may not be completely causal. There could be individual characteristics, such as perseverance and dedication, that influence both of these outcomes.

Happiness

Numerous studies have reported a significant positive correlation between education attainment and measures of happiness, life satisfaction and/or mental well-being. Some examples are Blanchflower and Oswald (2004, 2011) and Oswald and Wu (2011).

The results in Oreopoulos and Salvanes (2011) using data from the U.S. General Social Surveys are indicative of the findings in the literature. On the question about overall happiness with life, 89 percent of high school graduates without college report being happy or very happy. For those with some college (including associate degrees) but less than a bachelor's degree the proportion was more than 90 percent. For those with a bachelor's degree or more the proportion was about 94 percent. The education-happiness correlation remains, although not as quite strong, after controlling for the differences in income that are correlated with education attainment.

Intergenerational Benefits

The benefits of college attainment are partially passed on to children through parenting in numerous ways (e.g., there is a large literature showing a strong link between maternal education and children's health), but to confine the focus to a reasonable dimension just one effect is summarized here: the effect of parents' education on children's education attainment. See Holmlund, Lindahl and Plug (2011), de Haan (2011), and Pronzato (2012) for recent summaries of the literature on the intergenerational link in education attainment.

The results in de Haan (2011) using 2004/5 data from the Wisconsin Longitudinal Study (21,545 observations) are indicative of the findings. The average years of schooling of the children of parents with different levels of education are shown in Figure 28. Children of mothers with bachelor's degrees as their highest education qualification averaged 1.95 more years of education than the children of mothers with high school diplomas as their highest education qualification. Children of fathers with bachelor's degrees but without advanced degrees averaged an additional 1.74 years of education compared to the children of fathers with high school diplomas but without college.

The numbers reported in Figure 28 are raw correlations, however, and de Haan (2011) demonstrates that these raw correlations overstate the causal effect of parental education on children's education attainment. The emerging consensus in the literature is that the causal effect of parents' education on children's education is positive and significant, but not as large as suggested by the raw correlations.

Figure 28
Years of Children's Education
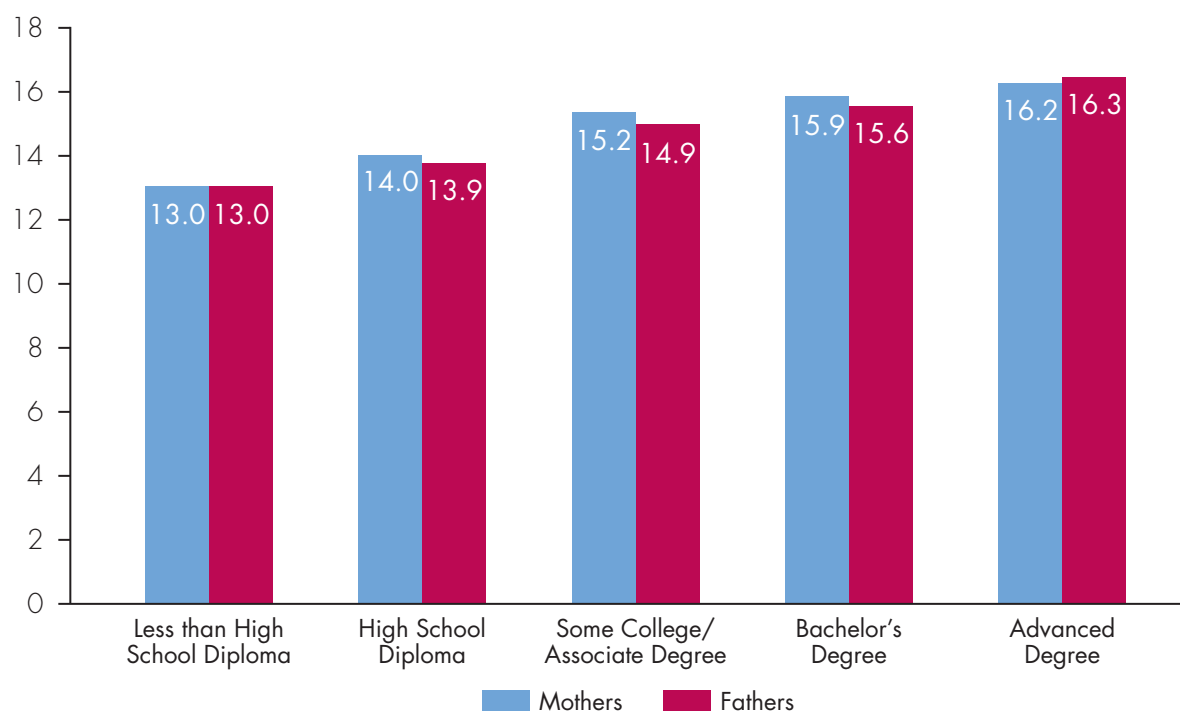
Source: de Haan (2011), Table 2.

Productivity Spillovers

It has long been theorized that education not only raises the productivity and income of those being educated but also raises the productivity and income of their colleagues. Or, education may raise the productivity and income of others through knowledge creation. Either way, human capital may have an important productivity externality or spillover. See, for example, Lucas (1988) and Romer (1990) and the many papers that they inspired on endogenous growth dependent on human capital accumulation.

Inspection of data on income and education attainment at the city or state level suggests merit to the idea that productivity spillovers from an educated population are important. The greater regional income associated with greater education attainment is substantially more than can be explained by the greater incomes for the individuals with more education. In other words, more education appears to create more aggregate income than the sum of higher incomes paid to those with more education. Significant productivity spillovers from an educated workforce are a ready explanation for this. But, as is typically the case in analyzing macroeconomic data, there are other possible explanations.

Estimating the magnitude of the productivity spillovers from a more educated workforce has proven to be difficult. Rauch (1993) and Moretti (2004) estimated a substantial positive externality from education attainment. Rauch estimated the external return to be about 70 percent as large as the private return (i.e., the direct effect on earnings shown in Figure 1). Moretti found an even larger external return—several times larger than the private return. Acemoglu and Angrist (2001) first estimated that the external return to be comparable in size to the private return, but then showed results indicating that most of the external return evident in the data was not a causal effect. They concluded that the causal external return was perhaps one-seventh as large as the private return. Ciccone and Peri (2006) concluded that the causal external return was not significantly different from zero.

Lange and Topel (2006) reviewed the literature and conducted some additional analysis and concluded that the evidence is decidedly inconclusive, saying: the evidence "does not demonstrate that externalities are unimportant," but "the data do not provide a strong reason to believe in the importance of productive externalities from schooling."

My reading of the evidence is not so pessimistic, though. The evidence seems to indicate that it is college education, as opposed to high school education, that creates productivity spillovers. Rauch (1993) examined all levels of education, as did Acemoglu and Angrist (2001) in their first set of estimates. The largest estimates were found in Moretti (2004), who examined college education only. Moreover, the small causal effects in Acemoglu and Angrist (2001) and Ciccone and Peri (2006) were estimated for high school education only.

The results in Iranzo and Peri (2009) support this conjecture. Their estimates for the causal external return from high school education are comparable to those in Acemoglu and Angrist (2001); that is, a small fraction of the private return. But Iranzo's and Peri's estimates for the causal external return to college education are substantially larger, roughly comparable in size to the private return.

In summary, although the evidence is not conclusive, it appears that productivity spillovers from college attainment may be substantial. This externality could be as important as direct financial return to college education. If so, the typical emphasis on just individuals' earnings misses half of the story even with just this one other effect.

Fiscal Externalities

Externalities from college education attainment also occur through the fiscal system. The higher earnings associated with higher education create additional tax revenues, and these additional tax revenues benefit others by financing public services. The lower incidences of poverty, unemployment, disability, etc. associated with college attainment also reduce government expenditures on public assistance and social insurance, which benefit others by freeing government resources for other public services and/or reducing taxes.

Unlike productivity externalities, fiscal externalities from education attainment have received scant attention from economists. This is somewhat puzzling for two reasons. As will be shown, fiscal externalities from college attainment are substantial. Moreover, direct fiscal externalities are much easier to measure than productivity externalities (although measuring fiscal externalities is not without conceptual and practical difficulties).

Perhaps the reason that fiscal externalities have been largely ignored in the academic literature is that they occur through the fiscal system. If there were no need for government services and taxes to finance them, then there would be no fiscal externalities. If the need for government services and taxes is taken as a given, however, then there are fiscal externalities that are conceptually analogous to productivity externalities.

Estimates of the fiscal externalities shown below are essentially an update of the estimates in Trostel (2010), which used data for 2005. The estimates below are derived from the March 2013 Social and Economic Supplement of Current Population Survey. Income and taxes in these data refer to calendar year 2012.

As in Trostel (2010), average lifetime fiscal effects are shown below. To be more specific, the present discounted values at age 19 (i.e., typical age of college entry) are estimated using a 3 percent real discount rate. As was done in calculating Figure 4, the following charts are calculated by first estimating age profiles of each fiscal effect (i.e., the average fiscal effect at every age up to 79 years old), and then applying a 3 percent annual discount rate at every age greater than 19. Fiscal policies are assumed to remain unchanged after 2012 (not because they are unlikely to change, but because it is impossible to forecast how they will change).

Also as in Figure 4, "traditional" career paths are assumed. Students are assumed to progress straight from high school to college and from matriculation to graduation in the standard number of years without working part time (the work career is assumed to begin at age 19 for high school graduates, 20 for those with some college but no degree, 21 for associate graduates, 23 for bachelor's graduates, and 26 for advanced graduates). It is assumed that students create no fiscal impact while in college other than the direct public cost of higher education. That is, college students are assumed to pay no taxes, and to receive the average level of social-insurance payments during college as before and after college.

As in Figure 4, it is implicitly assumed that the effects of working while in college roughly offset each other (i.e., working causes some students to take longer to graduate, but it also leads to them paying taxes while in college). Also as in the case of average lifetime earnings, the following estimates of the fiscal effects err on the conservatively low side. The calculations implicitly assume that there is no real growth in earnings and hence tax revenues. In addition, the different rates of mortality across college attainment are not taken into account.

Figure 29
Percent Value of Lifetime Taxes
(At age 19 using a 3% discount rate)
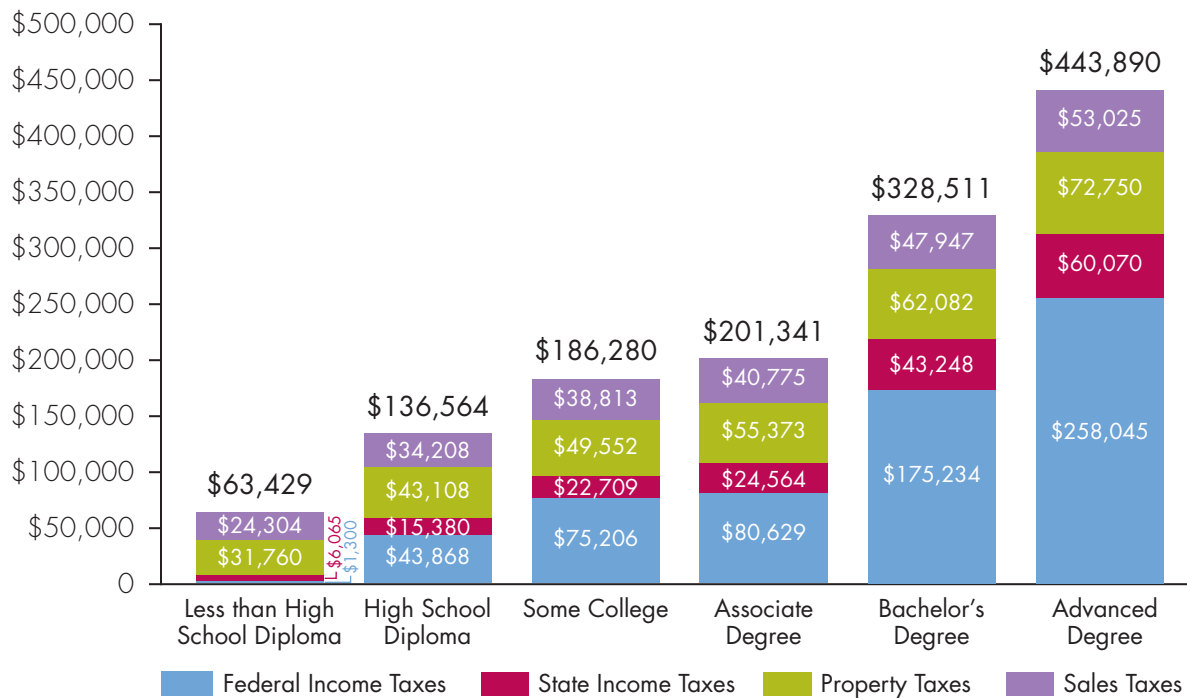
■ Federal Income Taxes	■ State Income Taxes	■ Property Taxes	■ Sales Taxes

Source: Author's estimates using data from the March 2013 Social and Economic Supplement of the Current Population Survey [and from Davis et al. (2013) for sales taxes].

The perspective in the next set of charts is reversed from the earlier charts that showed the private benefits to those earning college degrees. The perspective switches to the public (other taxpayers') view. Thus, additional taxes paid and lower receipts of government transfer payments are counted as public benefits in the following discussion.

Taxes

The present values of average lifetime taxes paid are shown in Figure 29 (other than Social Security taxes which are shown in Figure 30). The average high school graduate with no college pays about $44,000 in lifetime federal income taxes in present value. Those with some college but no degree pay about $31,000 more. The present value of the lifetime additional federal income taxes is $37,000 for associate degrees and $131,000 for bachelor's degrees. The average advanced-degree graduate pays about $83,000 more in lifetime federal income taxes in present value than the average bachelor's graduate without an advanced degree.

The pattern of the present value of average lifetime federal income tax payments illustrated in Figure 29 is similar to the pattern of the present value of average lifetime earnings illustrated in Figure 4, but considerably more pronounced. That is, the college premium in federal income tax

payments is proportionately larger than in earnings because the federal income tax structure is progressive. The present value of average lifetime federal income tax payments for high school graduates without college ($44,000) is 8.0 percent of the present value of their average lifetime earnings ($549,000). The average federal income tax rate is rate is 14.9 percent for bachelor's degrees and 16.2 percent for graduate degrees.

The college premium in state income taxes is similar to that for federal income taxes, but smaller and not as pronounced. The structure of state income taxes, on average, is not as progressive as federal income taxes. The average high school graduate with no college pays about $15,000 in lifetime state income taxes in present value. Those with associate degrees pay an additional $9,000 in present value, and bachelor's graduates pay an additional $28,000 in present value. Lifetime state income taxes as proportions of lifetime earnings are 2.8 percent for high school graduates without college, 3.1 percent for associate graduates, 3.7 percent for bachelor's graduates, and 3.8 percent for advanced graduates.

There is a college premium in property taxes, but it is considerably less pronounced than for state income taxes. The structure of state and local property taxes is, on average, regressive in these data (keeping in mind that property tax payments are being compared to earnings, rather than property values). The average high school graduate with no college pays about $43,000 in lifetime property taxes in present value. The present value of the additional lifetime property taxes is $12,000 for associate degrees and $19,000 for bachelor's degrees. Lifetime state and local property taxes as proportions of lifetime earnings are 7.9 percent for high school, 7.0 percent for associate degrees, 5.3 percent for bachelor's degrees, and 4.6 percent for advanced degrees.

Estimates for state and local sales and excise taxes are formulated by matching data on individuals' income (in 2012) with estimates of average sales and excise tax burdens for each income quintile in each state (using tax laws in 2013 and incomes in 2010) from the Institute on Taxation and Economic Policy's Microsimulation Tax Model (Davis et al., 2013).

The size and pattern of the college premium in sales taxes is comparable to the college premium in property taxes. High school graduates without college pay, on average, about $34,000 in lifetime state and local sales and excise taxes in present value. The present value of the additional lifetime sales taxes in present value is about $7,000 for associate degrees and $14,000 for bachelor's degrees. The structure of state and local sales and excise taxes is regressive. Lifetime state and local sales taxes as proportions of lifetime earnings are 6.2 percent for high school, 5.5 percent for some college but no degree, 5.1 percent for associate degrees, 4.1 percent for bachelor's degrees, and 3.3 percent for advanced degrees.

The present values of total lifetime taxes (not including Social Security taxes) are` also shown in Figure 29. Over an average lifetime, high school graduates without college pay nearly $137,000 in total taxes in present value. In present value, lifetime total taxes are $50,000 greater for some college, $65,000 greater for associate degrees, and $192,000 greater for bachelor's degrees. Holders of advanced degrees on average pay $115,000 more in lifetime total taxes in present value than those with bachelor's degrees as their highest education qualification. Lifetime total taxes (sans Social Security) as proportions of lifetime earnings are roughly the same across college credentials: 24.9 percent for high school graduates without college, 26.5 percent for some college and no degree, 25.3 percent for associate degrees, 28.0 percent for bachelor's degrees, and 27.8 percent for advanced degrees. Progressivity in income taxes is roughly offset by regressivity in property and sales taxes.

Figure 30
Percent Value of Lifetime Social Security and Medicare
(At age 19 using a 3% discount rate)
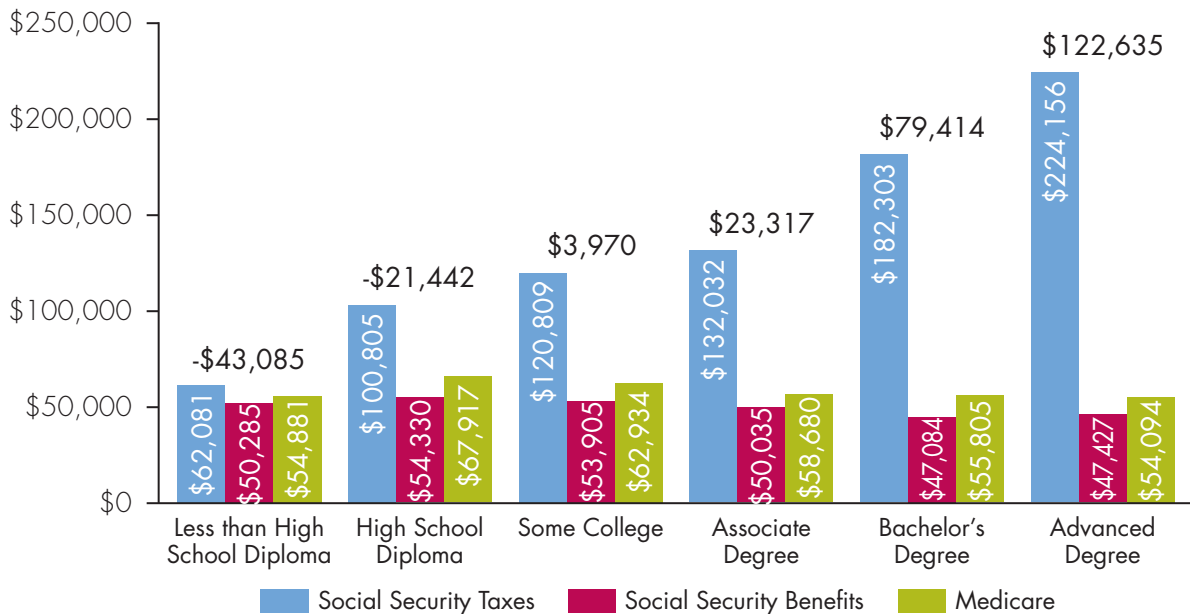
Source: Author's estimates using data from the March 2013 Social and Economic Supplement of the Current Population Survey.

Social Security and Medicare

Figure 30 reports the present value of average lifetime Social Security retirement benefits and payroll taxes and the insurance value of Medicare. These are considered together because Social Security retirement benefits are based, nonlinearly, on prior Social Security taxes paid. To examine Social Security retirement income and taxes separately gives a misleading picture of the net lifetime effects.

As with the other taxes, the present value of lifetime Social Security payroll taxes increase with college attainment. High school graduates with no college pay an average of about $101,000 in Social Security taxes over their lifetimes in present value. The present value of the additional lifetime Social Security taxes is $20,000 for some college, $31,000 for associate degrees, and $81,500 for bachelor's degrees. Those with advanced degrees pay about $42,000 more in Social Security taxes in present value than those with bachelor's degrees as their highest education qualification.

The estimates for Social Security retirement benefits and the value of Medicare are more tenuous than the estimates for taxes. There are two complicating issues for retirement benefits and Medicare, as well as a third complicating issue for Medicare.

To be consistent with the other fiscal estimates and to avoid the complication from the top-coding of age at 80 in the Current Population Survey data, the estimates for retirement benefits and Medicare

are only through age 79. Thus, these estimates understate the lifetime amounts. But the estimates are in present value at age 19, so the values at age 80 and older are not great (using a 3 percent annual discount rate and age 19 as the starting point, the discount factor at age 80 is 0.165; i.e., a dollar received at age 80 is equivalent to 16.5 cents at age 19).

On the other hand, everyone does not survive to age 80. The estimates do not take this into account, and thus overstate the average lifetime amounts of Social Security retirement benefits and Medicare. Moreover, as discussed previously, mortality rates decline significantly with college attainment. Consequently, the overstatement of retirement benefits and Medicare is smaller for those with more education.

The net effect of these two opposing effects on the overall magnitude of the estimates of lifetime Social Security retirement benefits and the insurance value of Medicare is ambiguous. The second effect, however, will cause the estimated college premium in Social Security retirement benefits and Medicare to be somewhat overstated.

There is also a reason that the college premium in the value of Medicare is somewhat understated, and thus the net bias in the case of Medicare is unclear. The value of Medicare in the Current Population Survey data is its insurance value, not the amount of health care paid by Medicare. The data do not take into account variation in the use of health care paid by Medicare. Given that health problems decrease significantly with college attainment (among recipients of Medicare, 33 percent of high school graduates with no college report their health to be very good or excellent, compared to 53 percent of those with a bachelor's degree as their highest education qualification), the cost of providing Medicare is significantly decreasing with college attainment but this is not accounted for in the data.

Keeping in mind the caveat that the college premium in Social Security retirement benefits is probably somewhat overstated, the estimates of the present value of lifetime Social Security retirement benefits generally decrease slightly with college attainment. There is a small fiscal saving in Social Security retirement benefits from greater college attainment. High school graduates without college receive an average of about $54,000 in lifetime Social Security benefits in present value. The present value of the reduction in lifetime Social Security retirement benefits is negligible for some college, $4,000 for associate degrees, and $7,000 for bachelor's degrees.

The reason for the slight fiscal saving in Social Security retirement benefits is that average retirement age increases significantly with college attainment. Those with more education have greater Social Security benefits once they start taking these benefits because of the link between benefits and prior Social Security taxes paid, but this link is weak because the Social Security benefit formula is highly progressive (average annual Social Security retirement benefits, for those receiving them, increase from $13,204 for high school and no college to $16,582 for advanced degrees).

Similar to the estimates for Social Security retirement benefits, the estimates for Medicare decrease slightly with college attainment. The present value of the lifetime insurance value of Medicare is about $68,000 for high school graduates without college. The present value of the fiscal savings in lifetime Medicare is about $5,000 for some college, $9,000 for associate degrees, and $10,000 for bachelor's degrees. As in the case of Social Security retirement benefits, the reason for the small fiscal saving in Medicare is that retirement age increases with college attainment.

The present value of the net lifetime effect of Social Security and Medicare is reported in Figure 30 as the numbers above each set of columns. That is, the present value of retirement benefits and Medicare health insurance are compared to the present value of taxes paid toward these programs. The college premium in the net lifetime effect is substantial, which is not immediately transparent when examining the components separately. The net present value of the cost to other taxpayers is about $21,000 for high school graduates without college. For those with some college but no degree there is a net saving to other taxpayers of $4,000 in present value. Thus, some college experience without a degree creates a fiscal saving in total Social Security and Medicare of more than $25,000. Associate degrees create an average taxpayer saving of about $45,000. The present value of the net benefit to taxpayers in Social Security and Medicare is $101,000 for bachelor's degrees. Advanced degrees create an additional $43,000 net benefit to taxpayers in present value. The college premium in net Social Security and Medicare is not as large as for federal income taxes, but it is larger than for all of the state and local taxes combined.
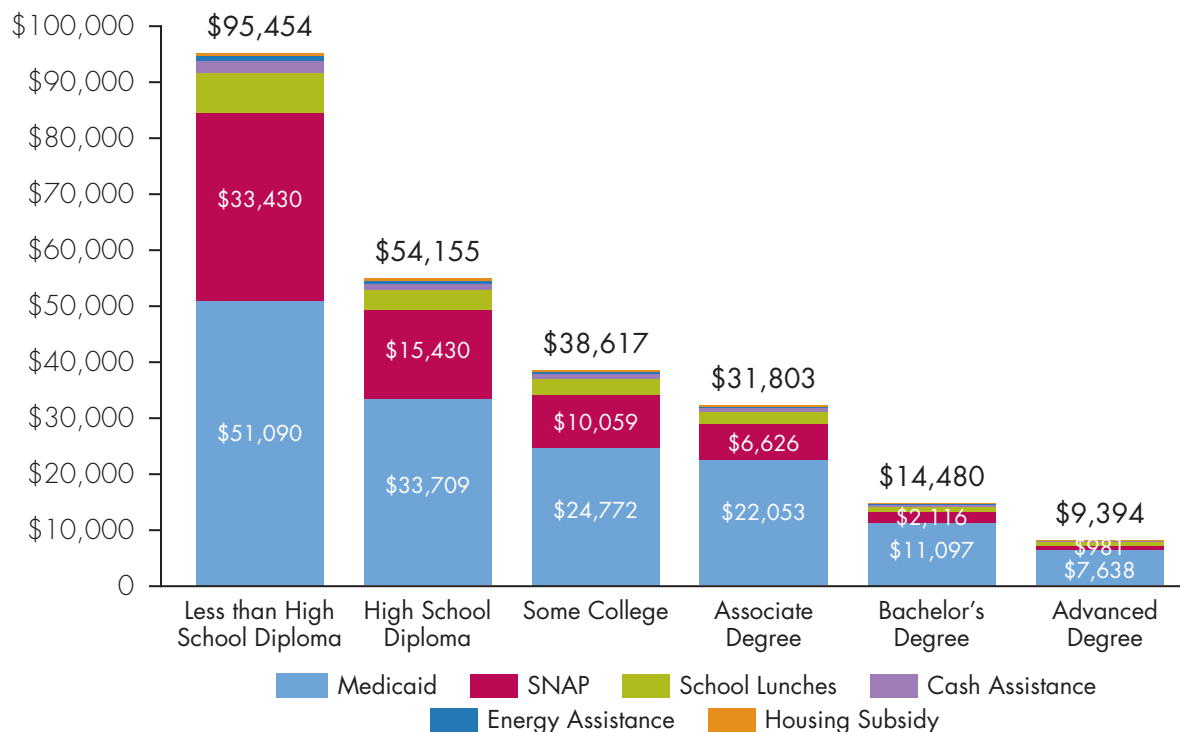
Public Assistance

The March Social and Economic Supplement of Current Population Survey contains data on receiving six types of means-tested social assistance: the insurance value of Medicaid, Supplemental Nutritional Assistance Program (SNAP, formerly known as food stamps), school lunches for children, various cash assistance, energy assistance and housing subsidies. The largest of these by far is Medicaid (64.1 percent of the total of the six types of public assistance), followed by SNAP (25.8 percent), school lunches (7.0 percent), and cash assistance (1.7 percent).

The college premium in these public assistance programs is illustrated in Figure 31. On average, high school graduates with no college receive about $54,000 in lifetime total public assistance in present discounted value. The present value of the savings to taxpayers from reduced total public assistance is about $22,000 for associate degrees and $40,000 for bachelor's degrees. Moreover, these estimates are somewhat conservative in that they do not include any public costs in administering public assistance programs, which are not trivial. The estimates are for the value to the recipients rather than the total fiscal cost. In addition, the estimates for Medicaid do not take into account any variation in the use of health care paid by Medicaid. As in the case of Medicare, the measure of Medicaid is its insurance value. Given that health problems vary inversely with college attainment (among recipients of Medicaid, 43 percent of high school graduates with no college report their health to be very good or excellent, compared to 59 percent of those with a bachelor's degree as their highest qualification), the public cost of Medicaid across college attainment varies more than its insurance value.

The fiscal savings in total public assistance from college attainment are substantial, especially in percentage terms. Associate graduates receive 41 percent less public assistance than high school graduates without college, on average. Bachelor's graduates without advanced degrees receive 73 percent as much public assistance as high school graduates without college. Given the strong negative correlation between college attainment and the incidence of poverty shown in Figure 5, perhaps this is to be expected. Indeed, the shape of the college premium in public assistance illustrated in Figure 31 is remarkably similar to the shape of the college premium in poverty shown in Figure 5 (e.g., compared to high school diplomas, some college is 71 percent as likely to be in poverty and receive 73 percent as much public assistance, bachelor's degrees are 28 percent as likely to be in poverty and

Figure 31
Percent Value of Lifetime Public Assistance
(At age 19 using a 3% discount rate)

Source: Author's estimates using data from the March 2013 Social and Economic Supplement of the Current Population Survey.

receive 27 percent as much public assistance, and advanced degrees are 18 percent as likely to be in poverty and receive 17 percent as much public assistance).

Most of the fiscal savings in total public assistance from college attainment is in Medicaid, but in percentage terms the college premium is considerably larger in SNAP, cash assistance, energy assistance and housing subsidies.

Social Insurance

Figure 32 illustrates the effect of college education on spending on four social insurance programs: unemployment insurance compensation, Supplemental Security Income, disability income and workers' compensation.

The college premium in unemployment benefits is relatively small, which may be surprising given the magnitude of the inverse correlation between the unemployment rate and college attainment reported in Figure 13. High school graduates with no college receive an average of about $8,000 in lifetime unemployment benefits in present value. Those with some college and associate degrees

Figure 32
Percent Value of Lifetime Social Insurance
(At age 19 using a 3% discount rate)
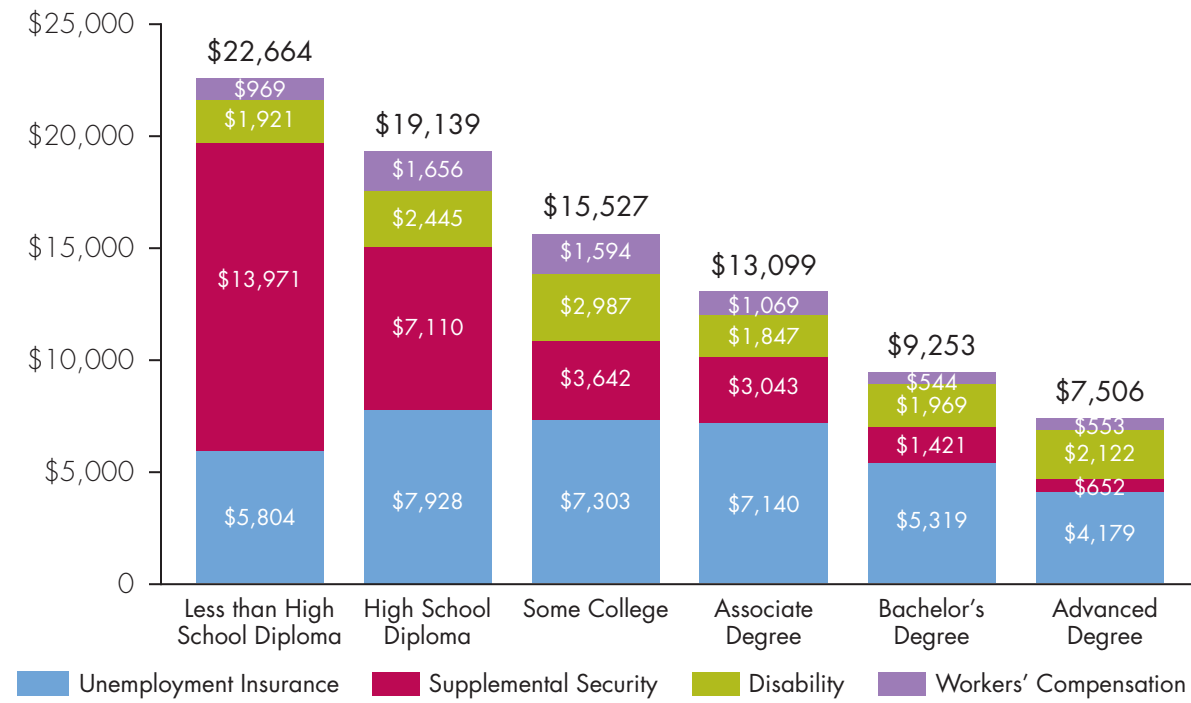
	Less than High School Diploma	High School Diploma	Some College	Associate Degree	Bachelor's Degree	Advanced Degree
Total	$22,664	$19,139	$15,527	$13,099	$9,253	$7,506
Workers' Compensation	$969	$1,656	$1,594	$1,069	$544	$553
Disability	$1,921	$2,445	$2,987	$1,847	$1,969	$2,122
Supplemental Security	$13,971	$7,110	$3,642	$3,043	$1,421	$652
Unemployment Insurance	$5,804	$7,928	$7,303	$7,140	$5,319	$4,179

Legend: Unemployment Insurance · Supplemental Security · Disability · Workers' Compensation

Source: Author's estimates using data from the March 2013 Social and Economic Supplement of the Current Population Survey.

receive slightly less unemployment benefits than high school graduates without college, but the present value of the lifetime difference is less than $1,000. Those with bachelor's degrees average about $3,000 less in lifetime unemployment benefits in present value than high school graduates. Those with advanced degrees receive about $1,000 less in unemployment benefits in lifetime present value than those with just bachelor's degrees.

Part of the reason that the fiscal saving in unemployment benefits varies less with college attainment than with unemployment rates is that unemployment compensation is partially tied to pre-unemployment earnings, which are increasing in college attainment. But this does not appear to be the full explanation. Average annual unemployment benefits for those receiving them only increases slightly with college attainment ($6,093 for high school graduates without college compared to $7,543 for bachelor's graduates without advanced degrees). It appears that differences in eligibility for unemployment benefits among those unemployed are also part of the story.

The college premium is disability income is also small. Indeed, it is essentially nil, which is surprising given the strong inverse correlation between reported disabilities and college attainment shown in Figure 19. It may be the case, however, that many persons with disabilities, particularly those with

less education, have not worked long enough to qualify for disability income. Instead, they may qualify for Supplemental Security Income.

Unlike unemployment insurance benefits and disability income, the college premium for Supplemental Security Income (SSI) is significant. The present value of average lifetime SSI is about $7,000 for high school graduates with no college. Those with some college with no degree receive about half this amount, and those with bachelor's degrees with no advanced degree receive one-fifth of this amount on average. Those with advanced degrees receive less than half of the amount that holders of bachelor's degrees receive.

Workers' compensation is an "off-budget" program in some states; that is, some states operate workers' compensation through private insurance companies dealing directly with employers. The effects, however, are the same whether on- or off-budget. Thus, workers' compensation is treated here as an implicit fiscal item in all states. The pattern of the college premium in the present value of lifetime workers' compensation shown in Figure 32 is similar to the college premium in receiving workers' compensation within the past year shown in Figure 11. The average present value of lifetime workers' compensation is roughly the same for high school, some college and associate degrees, but considerably lower for bachelor's and advanced degrees.

Public Health Care and Corrections

Two significant fiscal effects, public health-care costs created from families lacking health insurance and the costs from incarceration, cannot be estimated directly from individual-level data as in the case of the other fiscal effects.

The uninsured often cannot pay all their health-care costs, which imposes significant government and private-sector costs, although these costs are difficult to consistently pinpoint. Estimates in Hadley, Holahan, Coughlin and Miller (2008) indicate that the annual cost per uninsured in 2008 (in 2012 dollars) was about $913 to federal, state and local governments and about $309 to the private sector (hospitals, doctors, etc.). As shown in Figure 8, the incidence of uninsurance decreases substantially with college attainment, thus creating a significant college premium in these public costs.

Lifetime public costs from the lack of health insurance are calculated by estimating the incidence of uninsurance at each age (as done in estimating the other fiscal effects, except that the data are from the American Community Survey in this case) and multiplying them by the above estimates of the annual public costs of the uninsured. Given the negative relationship between college attainment and health problems, the resulting estimates of the college premium in the public costs of uninsurance are conservative. That is, the cost per uninsured is probably significantly decreasing in college attainment, but this is not taken into account in the estimates.

The Affordable Care Act should substantially reduce, if not essentially eliminate, the college premium in the public costs from uninsured health care. The Act, however, is also likely to increase the college premiums in federal income taxes and in Medicaid spending. The net effect of these changes on the total college fiscal premium is unclear at this point.

Per capita estimates of the present values of average lifetime public costs from the lack of health insurance are presented in Figure 33. Public costs from uninsurance are 31 percent lower for those

Figure 33
Percent Value of Lifetime Public Costs of Incarceration and Uninsurance
(At age 19 using a 3% discount rate)
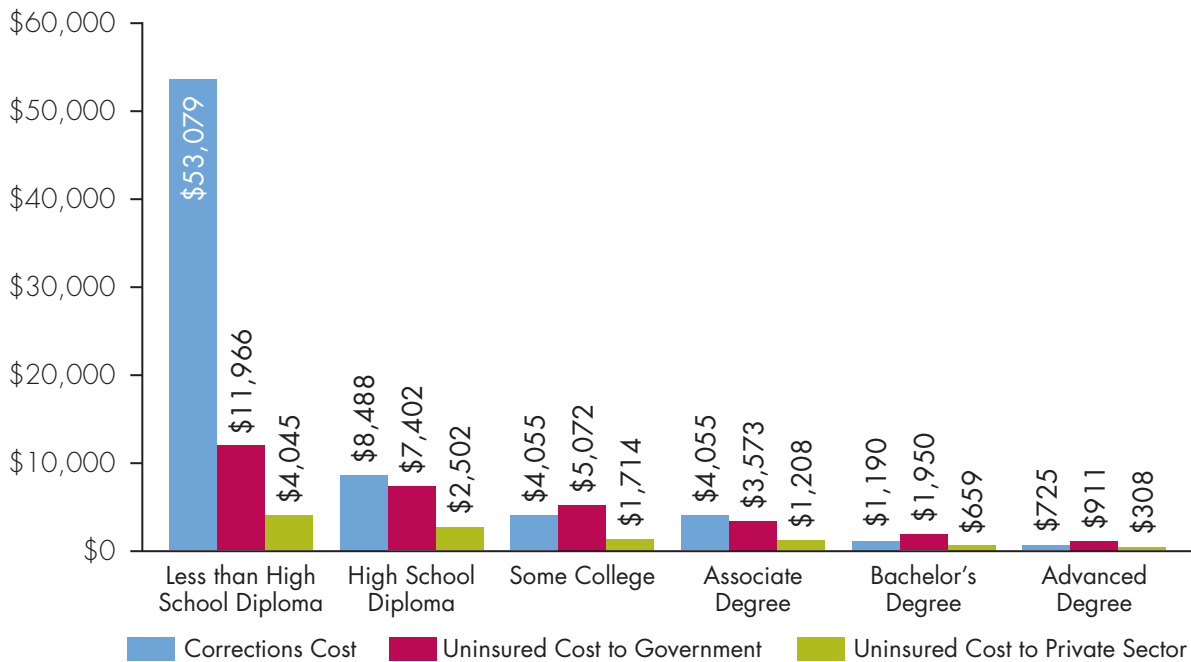
Source: Public costs from the uninsured are the author's estimates using data from the 2012 American Community Survey Public Use Microdata Sample and estimates from Hadley et al. (2008). Incarceration costs are the author's estimates using several datasets.

with some college but no degree compared to high school graduates but no college. Compared to high school diplomas, public uninsurance costs are more than halved for associate degrees and nearly three-fourths lower for bachelor's degrees.

Combining data on government spending on corrections from the Census Bureau's *State and Local Government Finances: 2010-11* and the Office of Management and Budget's *Budget of the United States Government for 2011* (Table 3.2) with data on inmates from the Bureau of Justice Statistics (Glaze and Parks, 2012) yields an annual corrections cost per prisoner of $37,080. Since the incidence of incarceration falls substantially with college attainment, as illustrated in Figure 25, college attendance creates significant saving in corrections costs. The incidence of incarceration at each age is estimated from the data used to generate Figure 25 and multiplied by $37,080 to formulate estimates of lifetime corrections costs.

The present value of lifetime corrections cost is about $8,500, on average, for each high school graduate without college. It is less than half of this amount for each of those with some college and associate degrees (the data on inmates does not allow these to be distinguished from each other). The average corrections cost for each bachelor's graduate without an advanced degree is less than one seventh of the amount for high school graduates without college.

Ideally the college premium could also be estimated for police costs and for court costs, but there is insufficient information on how crime affects these costs and on how crime varies with college attainment to do so with a reasonable degree of precision.

Total Fiscal Effects

The present values of total lifetime fiscal effects are presented in Figure 34. The present value of total taxes includes Social Security taxes in this chart. The present value of total expenditures is the sum of Social Security retirement benefits, Medicare, all public assistance, all social insurance, the government cost of uninsured health care, and corrections. As noted earlier, the estimated college premiums in both taxes and expenditures are likely to err on the conservative side (i.e., understate the fiscal benefits from college attainment).

High school graduates without college pay about $237,000 in taxes over their lifetimes, on average and in present discounted value at age 19, and receive about $211,000 in direct fiscal benefits (which does not include the indirect benefits from police and fire protection, national defense, the court system, enforcement of regulations, etc.). The present value of their net contribution to the rest of society in the form of government services is roughly $26,000. This is illustrated in Figure 35.

Figure 34
Percent Value of Total Lifetime Fiscal Effects
(At age 19 using a 3% discount rate)
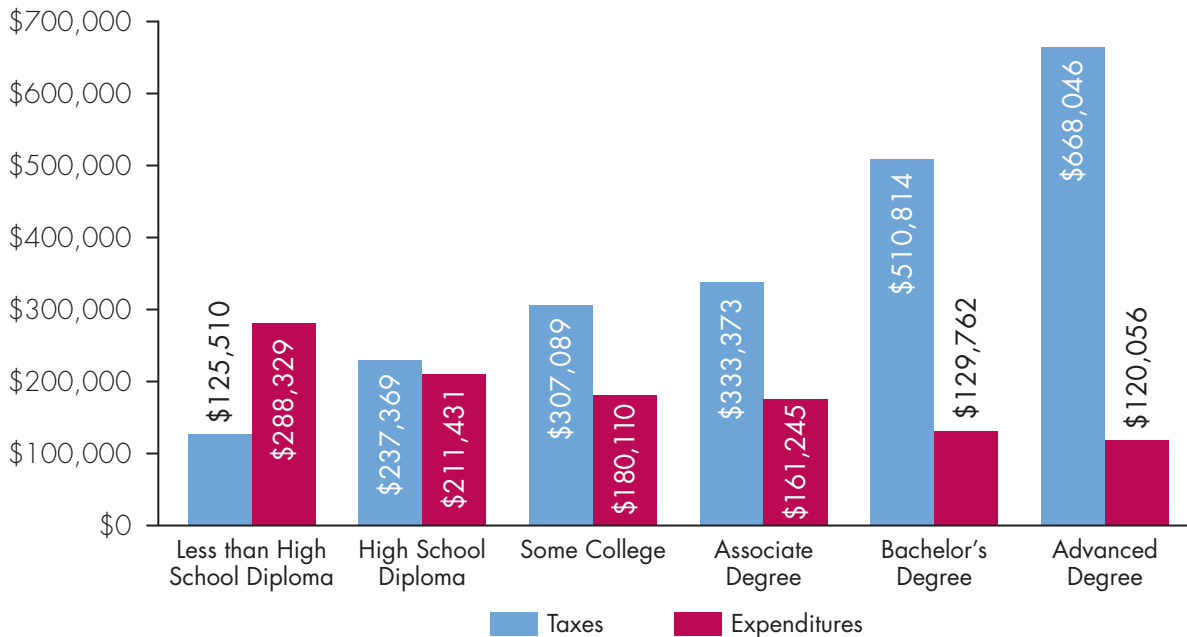
Source: Author's estimates using several datasets.

Figure 35
Percent Value of Net Lifetime Fiscal Impact
(At age 19 using a 3% discount rate)
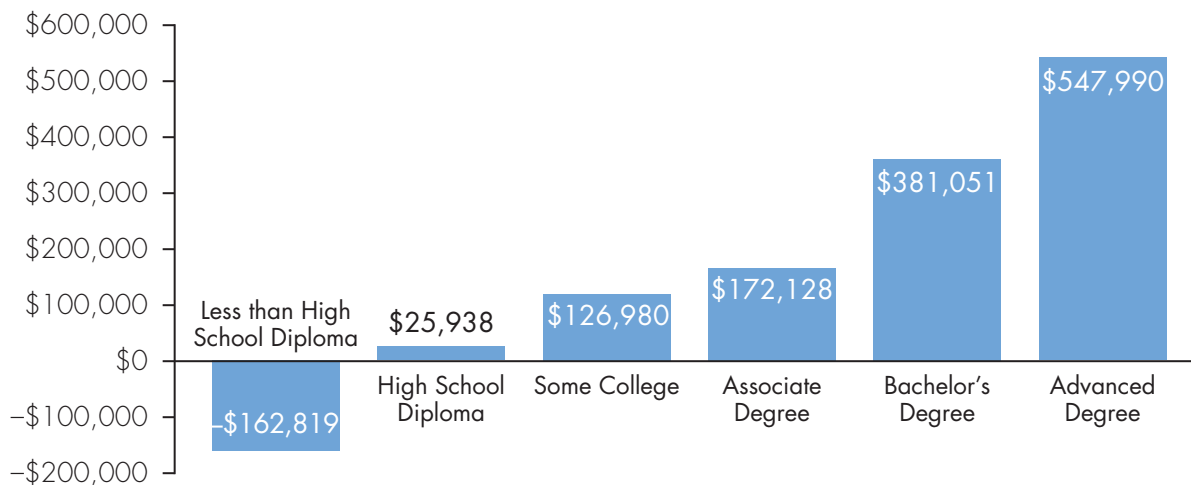
Source: Author's estimates using several datasets.

Those with some college but without degrees pay about $70,000 (29 percent) more in lifetime taxes in present value than high school graduates without college, and they receive $31,000 (15 percent) less in direct fiscal benefits. The present value of their net contribution to the rest of society in the form of government services is about $101,000 more than high school graduates with no college.

Those with associate degrees as their highest education credential pay about $96,000 (40 percent) more in lifetime taxes in present value than high school graduates with no college, and they receive roughly $50,000 (24 percent) less in direct fiscal benefits. The present value of their net contribution to government services (i.e., their net fiscal contribution to other citizens) is $146,000 more than high school graduates with no college.

Bachelor's degree graduates without advanced degrees pay $273,000 (1.15 times) more in lifetime taxes in present value than high school graduates without college, and they receive $82,000 (39 percent) less in direct fiscal benefits. The present value of their net contribution to government services is $355,000 more than high school graduates with no college, on average.

Holders of advanced degrees pay $157,000 (31 percent) more in lifetime taxes in present value than bachelor's graduates without advanced degrees, and they receive about $10,000 (7.5 percent) less in direct fiscal benefits. The present value of their average net contribution to government services is $167,000 more than bachelor's graduates without advanced degrees.

Crime

The strong negative correlation between college attainment and incarceration suggests a strong underlying inverse relationship between college attainment and criminal behavior. Less crime is obviously important to society, thus crime reduction is likely to be another important social benefit from college attainment. Quantifying this benefit is challenging, though.

Lochner and Moretti (2004) is the most thorough investigation quantifying of the benefit of education in reducing crime. They estimated that reduction in the annual social costs of crime (i.e., the dollar value of the harm to victims plus the costs of incarceration) to be $3,337 (in 2012 dollars) per male high school graduate, and this is probably a conservative estimate. This amount is 26 percent as large as the additional earnings from high school graduation. Unfortunately, the authors did not provide estimates for other levels of education attainment or for women.

Lochner and Moretti focused on male high school graduation because this appears to be where most of the "action" is in terms of crime. Recall from the earlier discussion of Figure 25 that the incarceration rate drops from 3.98 percent for high school dropouts to 0.75 percent for high school graduates with no college. The same dataset indicates that 91.6 percent of the prison population is male.

Rough estimates of the crime-reduction benefits of college education can be formed by extrapolating some of Lochner and Moretti's findings. In particular, their Table 13 reports estimates of the effects on crimes from a one percentage point increase in the rate of high school completion for males. Some of their other results suggest that variation in incarceration rates appears to be roughly proportionate to variation in crime rates. Thus, the incarceration rates reported in Figure 25 are used extrapolate Lochner and Moretti's estimates to college completion and for women. Specifically, differences in incarceration rates suggest that the crime effects for men are 10.9 times larger than for women, and that the reduction in crimes from high school completion is 5.4 times larger than the reduction in crimes from completing bachelor's degrees.

This extrapolation of Lochner and Moretti's estimates suggests that for every 100,000 bachelor's degrees, every year there are four fewer murders, 406 fewer assaults and 648 fewer property crimes. Table 231 of the *Statistical Abstract of the United States: 2012* suggests that there are about 51.2 million working-age Americans with bachelor's degrees or higher. Thus, because of the attainment of bachelor's degrees, each year there are roughly:

- 2,050 fewer murders. Table 1 of *Crime in the United States, 2012* indicates that there were 14,827 murders in the U.S. in 2012. This number would have been 14 percent larger if not for college attainment.
- 208,000 fewer assaults. There were 760,739 assaults in 2012. This number would have been 27 percent larger if not for college education.
- 332,000 fewer property crimes. There were 8,975,438 property crimes in 2012. This number would be 4 percent higher if not for college education.

Moreover, these estimates are for the completion of bachelor's degrees only.

The above estimates are crude and cannot be interpreted as facts. They are based on extrapolation rather than direct estimation. Moreover, the base numbers from Lochner and Moretti are not estimated with great precision, particularly for property crimes. Thus, the estimates above are intended only to be suggestive and to highlight the importance of college education in creating a safer society.

Philanthropy

College attendance appears to make people significantly more generous. That is, there appears to be a significant philanthropy externality from college attainment. This is seen in at least three dimensions: volunteering, employment in not-for-profit organizations, and in cash donations to charity.

Volunteerism

The first column in Figure 36 reports the percentage of 27- to 66-year-olds volunteering within the past year. It is derived using data from the September 2012 Volunteer Supplement of the Current Population Survey. The volunteer proportion increases from just over 17 percent for high school graduates with no college, to 28 percent for those with some college but without degrees, to 40 percent for those with bachelor's degrees but without advanced degrees, to nearly 49 percent for those with graduate degrees.

The increase in the volunteering proportion associated with college attainment is substantial, but this measure may understate the increase in volunteering activities associated with college attainment. This is shown by comparing the first column in Figure 36 to the second column, which shows the average number of volunteer organizations in the past year. Many individuals volunteer for more than one organization per year, and evidently this phenomenon increases with college attainment.

Figure 36
Volunteering
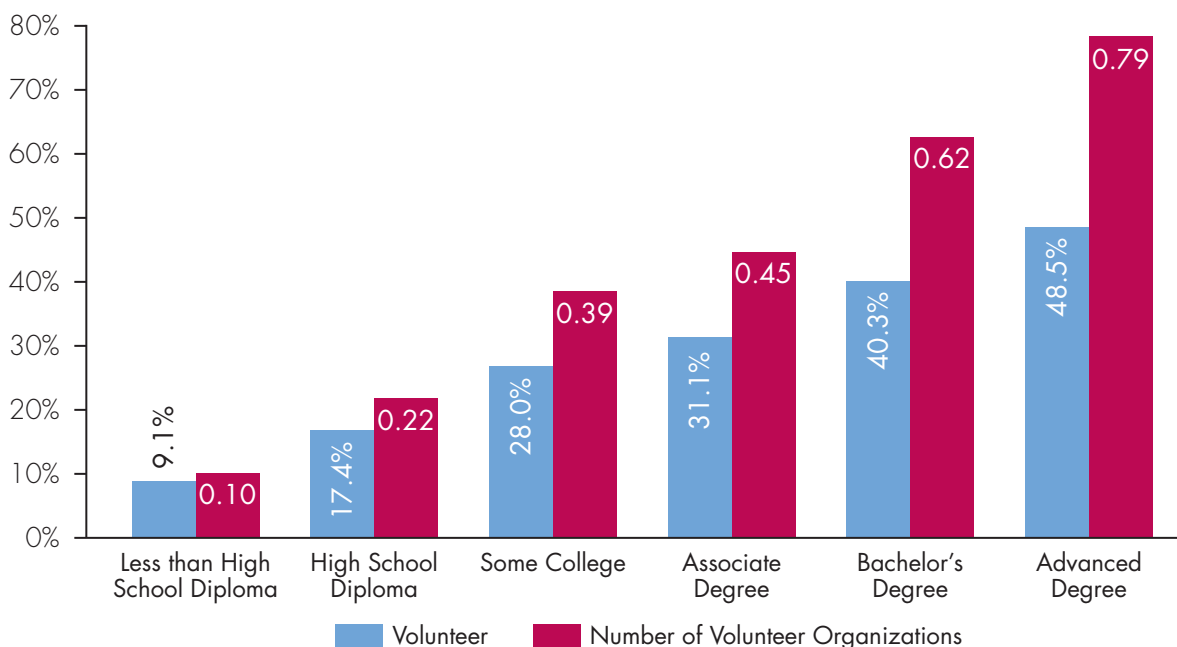
Source: Author's calculations using the September 2012 Volunteer Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 60,848.

Volunteers with a high school diploma but no college help an average of 1.28 organizations per year. Volunteers with some college but no degree help 1.40 organizations on average. This number rises to 1.44 for associate degrees, to 1.55 for bachelor's degrees, and to 1.64 for graduate degrees.

The second measure of volunteerism, the average number of volunteer organizations helped in the past year, indicates that there is a 75 percent increase from high school and no college to some college and no degree. There is a doubling of this measure going from high school and no college to associate degrees. The increase in volunteer activities associated with college attainment appears to be quite large.

Annual hours of volunteered time can also be constructed from data in the September 2012 Volunteer Supplement of the Current Population Survey. The average number of annual volunteer hours for those volunteering is 122.5, and is roughly the same for all levels of college attainment. The value of this volunteer labor can then be constructed by applying average hourly wage rates for each level of college attainment (derived from the March 2012 Social and Economic Supplement of Current Population Survey for those ages 27 to 66 and not in college). This is shown in Figure 37.

The value of volunteer hours is imperfectly measured by the average wage rate for each level of education attainment, but there is probably no better alternative. The estimates reported in Figure 37 are based on an imperfect measure of the opportunity cost of the donated time to the volunteer,

Figure 37
Value of Volunteer Labor
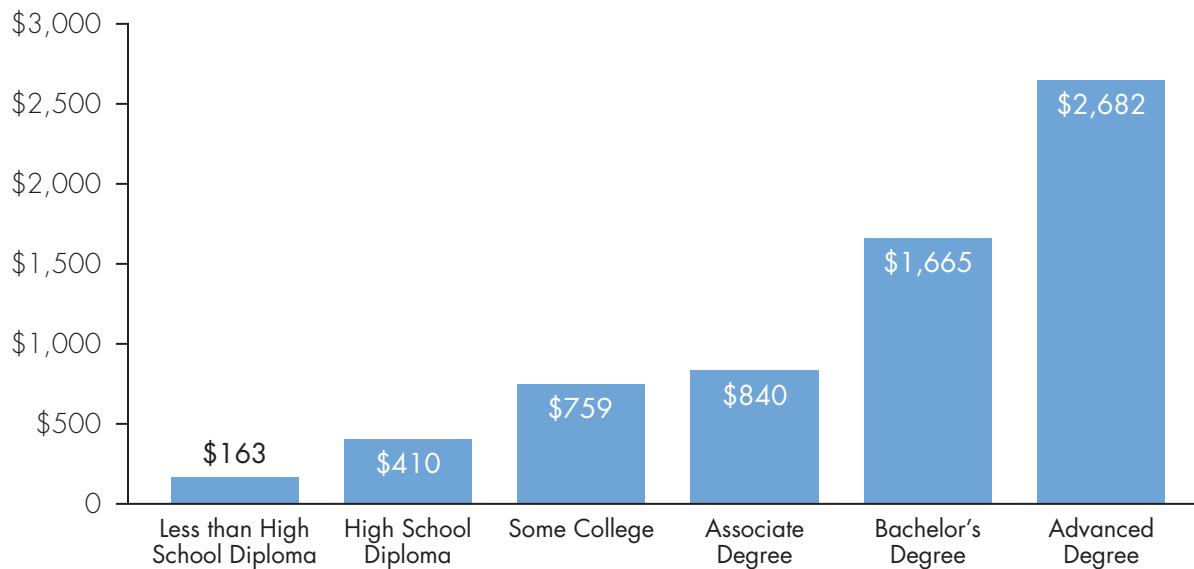
Source: Author's estimates using data from the September 2012 Volunteer Supplement and the March 2013 Social and Economic Supplement of the Current Population Survey.

which is not necessarily the value of the work to the organization (and, by extension, to society). Thus, these set of estimates should only be interpreted as suggestive.

High school graduates with no college contribute an average of $410 per year in volunteer labor (20.9 hours times $19.66 per hour). Holders of associate degrees contribute more than twice as much, $840 (37.0 times $22.70), as high school graduates without college. Bachelor's graduates give an average of $1,665 (46.5 times $35.77) in volunteer labor per year, and holders of graduate degrees give $2,682 (59.5 hours times $45.06 per hour) annually.

The ratio of the value of volunteered labor relative to earnings from work also increases with college attainment. For high school graduates without college, the value of volunteer time is 1.7 percent as much as their annual earnings, on average. This ratio rises to 2.3 percent for associate degrees and to 3.0 percent for bachelor's degrees. The average value of volunteered time is 3.3 percent of average earnings for those with advanced degrees.

Not-for-Profit Employment

Philanthropically inclined individuals can also partially donate their time and effort by working for good causes, and accepting lower pay as a result. Or, another interpretation is that an important fringe benefit from work can be the "warm glow" from working for a good cause. That is, part of the full compensation from working for a good-cause employer is the nonmonetary warm glow, and that the lower pay in good-cause employment is a compensating wage differential (i.e., those working for good causes are fully compensated in what matters to them, which is not just money). Under either interpretation, though, there is an external benefit to society from good-cause employment. Philanthropically inclined workers implicitly subsidize socially worthwhile causes in the form of lower wages.

This idea is explored using employment (including self-employment) and earnings data in the 2012 American Community Survey for those ages 27 to 66, not enrolled in college, and not in government employment. Government employment is excluded for this analysis because it is unclear if workers consider government employment a good cause. Government employment may also differ in important other ways, such as job security. Thus, a cleaner delineation is in private-sector employment only, and not-for-profit employment (specifically, employment in private not-for-profit, tax-exempt, or charitable organizations) is compared to for-profit employment. The presumption here is that, on average, not-for-profit employment represents work for socially worthwhile causes. Not all not-for-profit work is necessarily for worthy causes, and not all for-profit work is necessarily for socially unworthy causes. On average, though, the distinction between nonprofit organizations and for-profit companies should capture the idea of working for worthy causes.

An initial examination of the data does not lend much merit to the idea that philanthropically inclined workers implicitly subsidize worthy causes. In 2012, the average earnings of nonprofit workers were only 2.1 percent less than the average earnings of for-profit workers. But this does not take into account that nonprofit employees generally have significantly more college education than for-profit workers. This is shown in Figure 38. About 5 percent of employed (including self-employed) high school graduates without college work for nonprofits. Nearly 7 percent of workers with some college but without degrees are in the nonprofit sector. About 10 percent of workers with associate degrees and bachelor's degrees but without advanced degrees are in the nonprofit sector. About 15 percent of workers with graduate degrees are in the nonprofit sector. Given the substantially greater college attainment in nonprofit employment and the substantially greater average earnings of those with greater
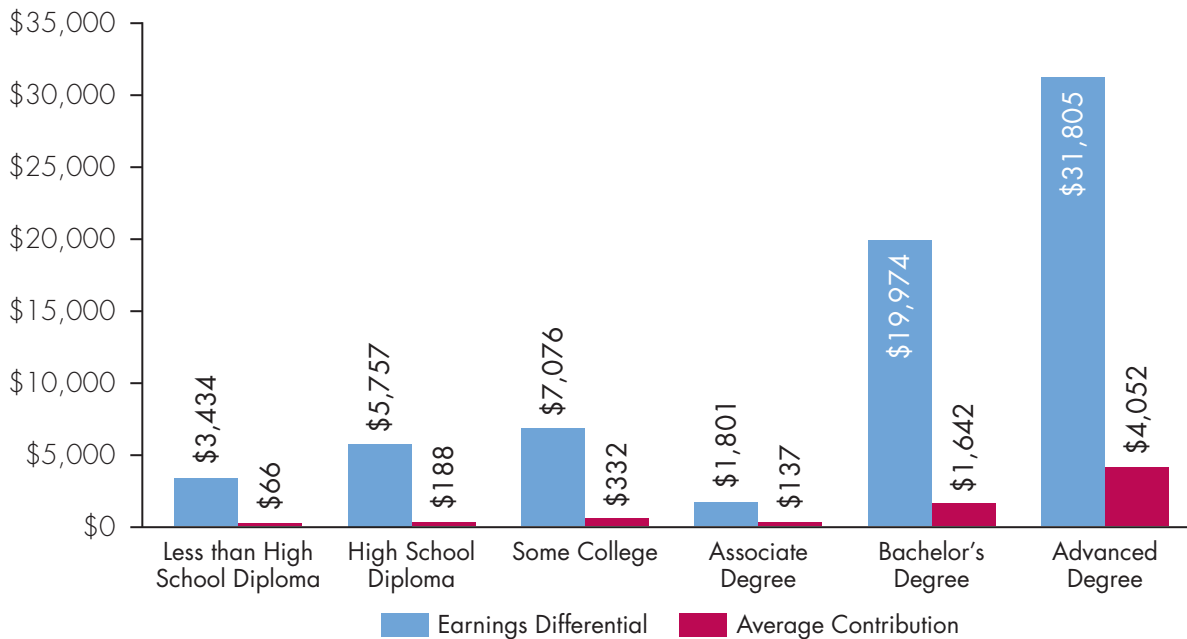
Figure 38
Not-for-Profit Employment
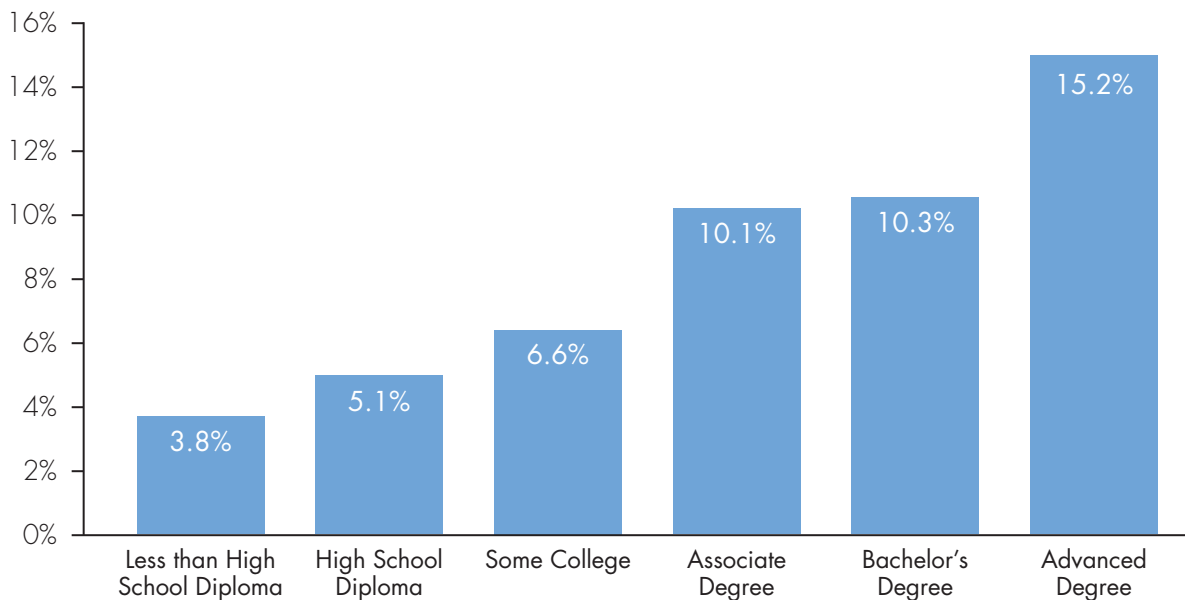
Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 1,105,323.

college attainment, average earnings should be substantially higher in the nonprofit sector if all else were equal. Evidently not all else is the same, though. Workers in the nonprofit sector for a given level of education attainment have significantly lower average earnings. It appears that, on average, employees for nonprofit organizations implicitly subsidize worthy causes by accepting lower wages.

To quantify the implicit donations to worthy causes in the form of reduced earnings from non-profit employment, the differences in average earnings between for-profit and not-for-profit work are calculated for each level of college attainment. These differences (i.e., the compensating wage differentials) are reported in the first column of Figure 39. Average annual earnings of high school graduates working in the nonprofit sector are about $5,800 (16 percent) less than in the for-profit sector. Average earnings of those with some college working for nonprofits are about $7,100 (16 percent) less than those with some college working in the for-profit sector.

The not-for-profit earnings differential is considerably smaller for associate degrees, though. Average earnings of those with associate degrees are about $1,800 (4 percent) lower in the nonprofit sector compared to the for-profit sector. Average earnings of holders of bachelor's degrees are $20,000 (27 percent) lower in nonprofit employment than in for-profit employment. For those with advanced degrees, annual earnings are $31,800 (28 percent) lower in nonprofit work than in for-profit work. Once differences in college attainment are taken into account, the implicit subsidy that not-for-profit workers give to worthy causes is evidently substantial (except for the puzzling case of associate degrees).

Figure 39
## Earnings Sacrificed for Not-for-Profit Employment

Source: Author's calculations using the 2012 American Community Survey Public Use Microdata Sample, ages 27-66 and not enrolled in college, N = 877,787.

The second column in Figure 39 shows the average contribution made to worthy causes in the form of reduced earnings from working for nonprofit organizations. The average high school graduate with no college contributes nearly $200 per year ($5,757 earnings differential times 64.5 percent working times 5.1 percent working for nonprofits). This is 0.8 percent of the average earnings of high school graduates with no college. The average bachelor's graduate with no advanced degree contributes nearly nine times more than high school graduates with no college: $1,642 annually ($19,947 × 79.9% × 10.3%). This is 2.9 percent of the average earnings of bachelor's graduates without advanced degrees. The average contribution for those with advanced degrees is nearly $4,100, which is 4.9 percent of their average earnings.

Charitable Contributions

The best source of data on contributions to charity that can be matched with college attainment is the Consumer Expenditure Survey. Data from 2012 are summarized in Figure 40. This chart shows estimates of average annual cash contributions to charities, religious organizations, and educational institutions. This chart understates all charitable contributions because it does not include cash gifts to individuals, donations of noncash financial assets (i.e., stocks, bonds, etc.), donations of goods or posthumous gifts. Gifts to individuals and gifts of financial assets are not included because not all of

Figure 40
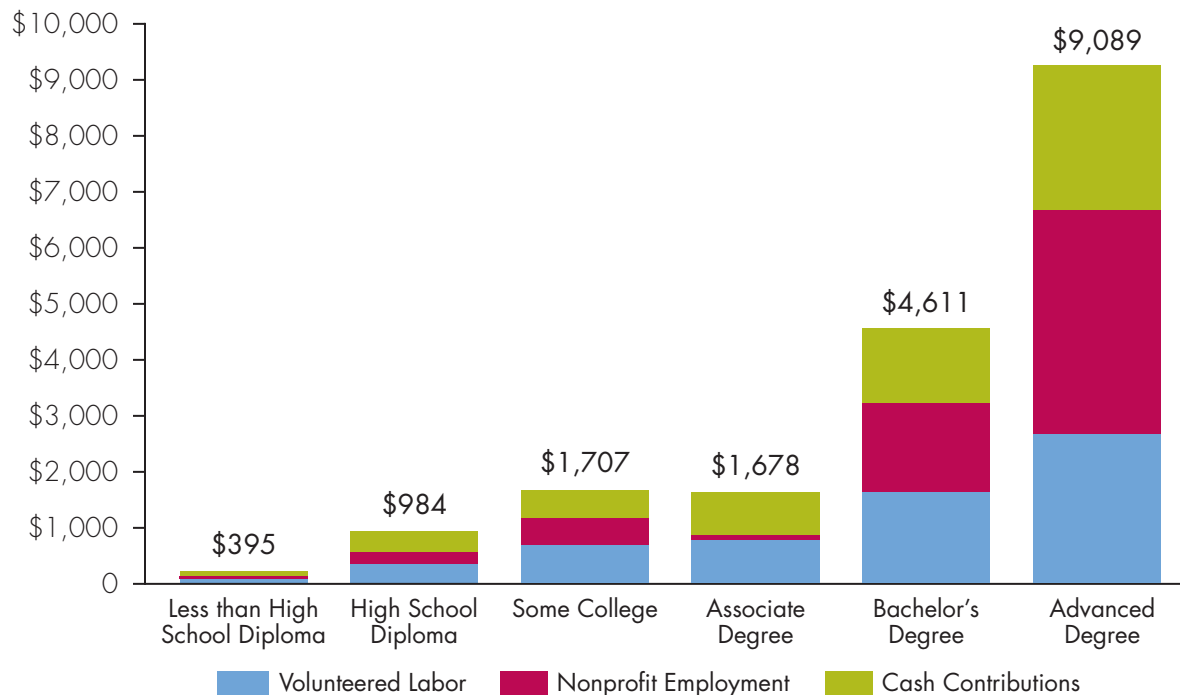## Annual Charitable Contributions
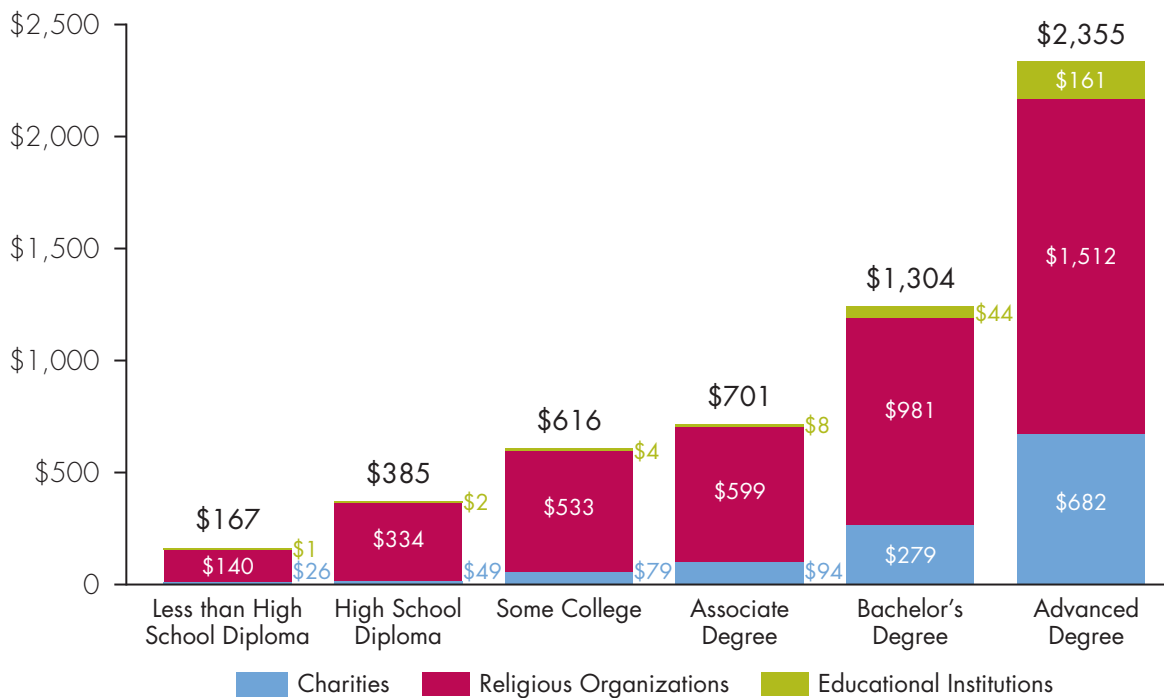
Source: Author's calculations using the 2012 Consumer Expenditure Survey, ages 27-66, N = 24,161.

these gifts are necessarily "charitable" in that they include transfers to family members not living in the same household. Donations of goods and bequests are not included because they are not measured in the Consumer Expenditure Survey.

Cash contributions to all three types of organizations shown in Figure 40 increase monotonically with college attainment. The least pronounced increase with college attainment is for contributions to religious organizations. But even religious contributions nearly triple when comparing those with bachelor's degrees as their highest education qualification to those with high school diplomas as their highest education qualification.

Average total annual cash contributions rise from less than $400 (1.6 percent of their average earnings) for high school diploma and no college, to about $600 (2.0 percent of their earnings) for those some college but no degree, to $700 (1.9 percent) for associate degrees, to $1,300 (2.3 percent) for bachelor's degrees but no advanced degree, to nearly $2,400 (2.9 percent) for those with advanced degrees. The increase in average giving with college attainment is due both to an increase in the proportion of people giving and to an increase in the average contribution of those giving.

Figure 41
Total Philanthropic Contributions

Source: Author's estimates using several datasets.

Total Philanthropic Contributions

To facilitate comparison, the estimated annual dollar values of volunteered labor, earnings sacrificed for nonprofit employment, and cash charitable contributions are shown together in Figure 41. For all three of these forms of philanthropy, the magnitudes and the relationships with college attainment are similar. Each reveals significantly increasing generosity (in absolute terms as well as in percentages of earnings) from increasing college attainment.

The sum of the three forms of philanthropy is also shown at the top of the columns in Figure 41. On average, high school graduates without college give a total of about $1,000 (4.1 percent of their earnings) annually, those with some college but without degrees give about $1,700 (5.4 percent of their earnings) per year, those with associate degrees as their highest education credential also give about $1,700 (4.6 percent) per year, those with bachelor's degrees but without advanced degrees give $4,600 (8.2 percent) annually, and those with advanced degrees give about $9,100 (11.0 percent of their average earnings) per year.
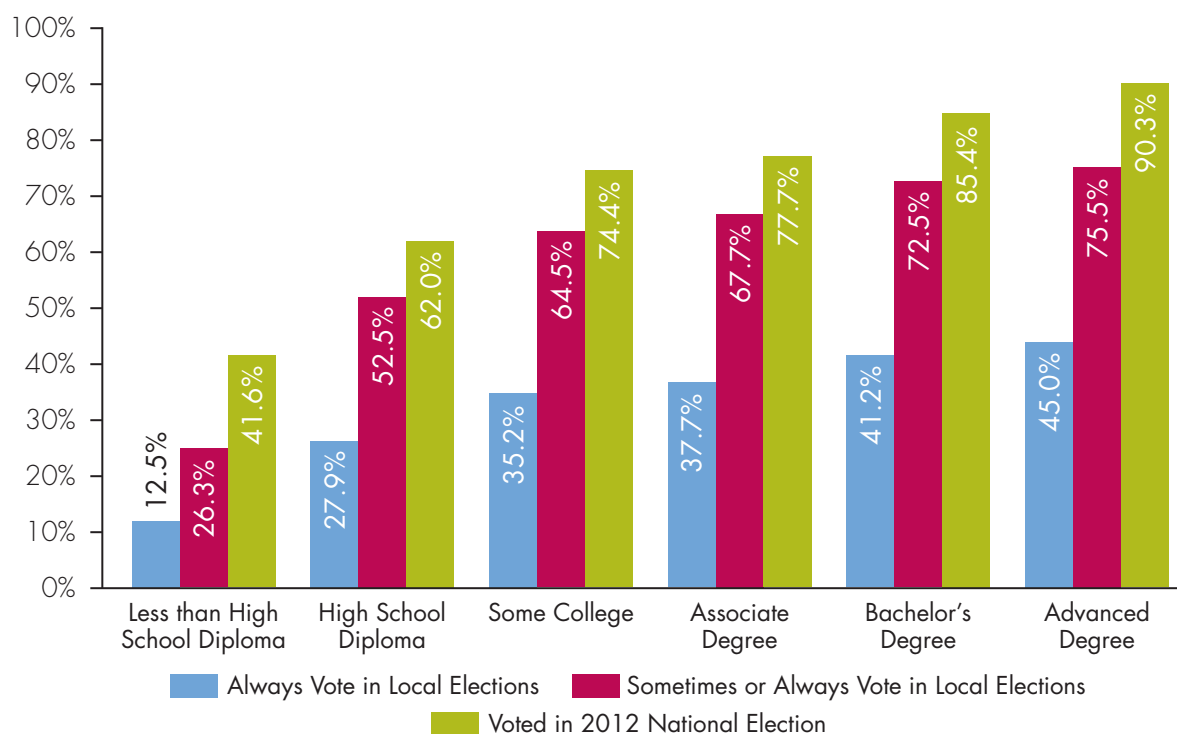
Civic Engagement

Numerous studies have documented a significant relationship between education and various forms of civic participation. For reviews of this literature see Nie, Junn and Stehlik-Barry (1996); Milligan, Moretti and Oreopoulos (2004); Dee (2004), and Lochner (2011).

The November 2011 Civic Engagement Supplement of the Current Population Survey contains several measures suggesting individuals' civic involvement.

Political Participation

Figure 42 shows self-reported voting rates in 2011 and 2012. The first two columns show responses to a question about voting in local elections. About 28 percent of high school graduates without college claim to always vote, compared to 35 percent of those with some college without degrees, 41 percent of those with bachelor's degrees as their highest education qualification, and 45 percent of holders of advanced degrees. The pattern across college attainment is similar for voting in local elections at least sometimes: nearly 53 percent for high school graduates without college, more than 64 percent for those with some college but no degree, more than 72 percent for those with bachelor's degrees without advanced degrees, and almost 76 percent for holders of advanced degrees.
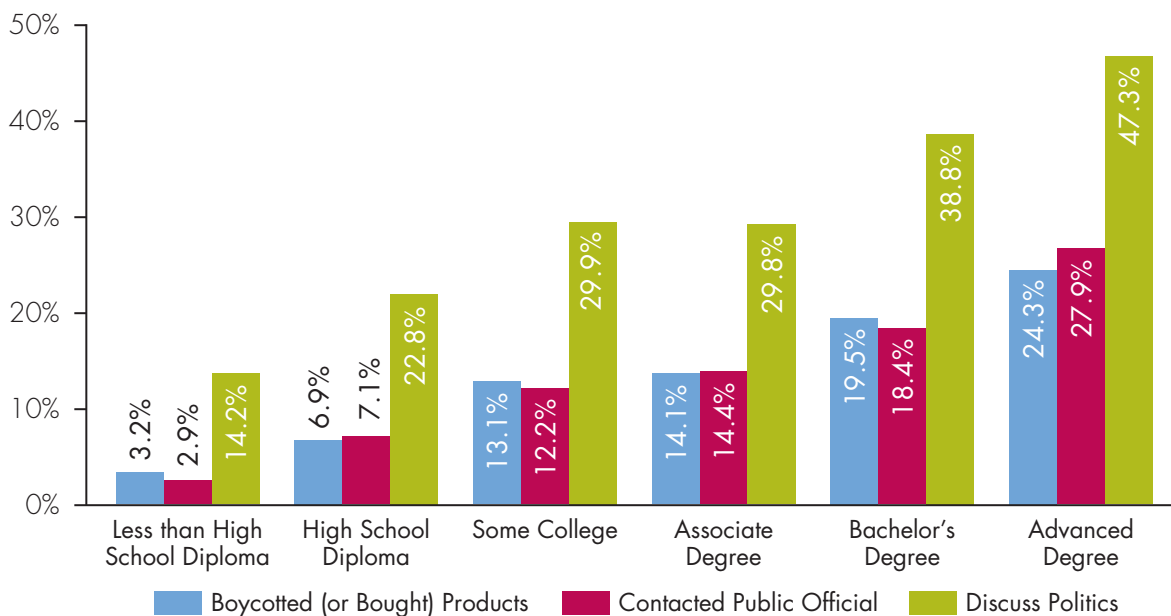
Figure 42
Voting

Source: Author's calculations using the November 2011 Civic Engagement Supplement and the November 2012 Voting & Registration Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 55,165 and 56,861, respectively.

A similar pattern across college attainment is also seen in the third column in Figure 42, which shows the self-reported voting rates in the 2012 national election (using data from the November 2012 Voting & Registration Supplement of the Current Population Survey). About 62 percent of high school graduates without college claim to have voted, compared to 74 percent for those with some college but without degrees, 85 percent for bachelor's graduates, and 90 percent for advanced graduates.

The self-reported voting numbers shown in Figure 42 are considerably higher than typical voting rates. For example, the overall voting rate in the 2012 presidential election appears to have been less than 60 percent. Thus, one has to wonder about the extent of truthful reporting in these data. One might also wonder if the extent of truthful reporting is correlated with college attainment.

Figure 43 shows three measures indicating political awareness and involvement. The first column shows the proportion reporting that in the past year they had "bought or boycotted a certain product or service because of the social or political values of the company that provides it." This measure of political engagement rises substantially with college attainment: from 7 percent for high school, to 13 percent for some college, to more than 19 percent for bachelor's degrees, to more than 24 percent for advanced degrees.

Figure 43
Behaviors Suggesting Political Awareness and Involvement

Source: Author's calculations using the November 2011 Civic Engagement Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 53,949 or more.
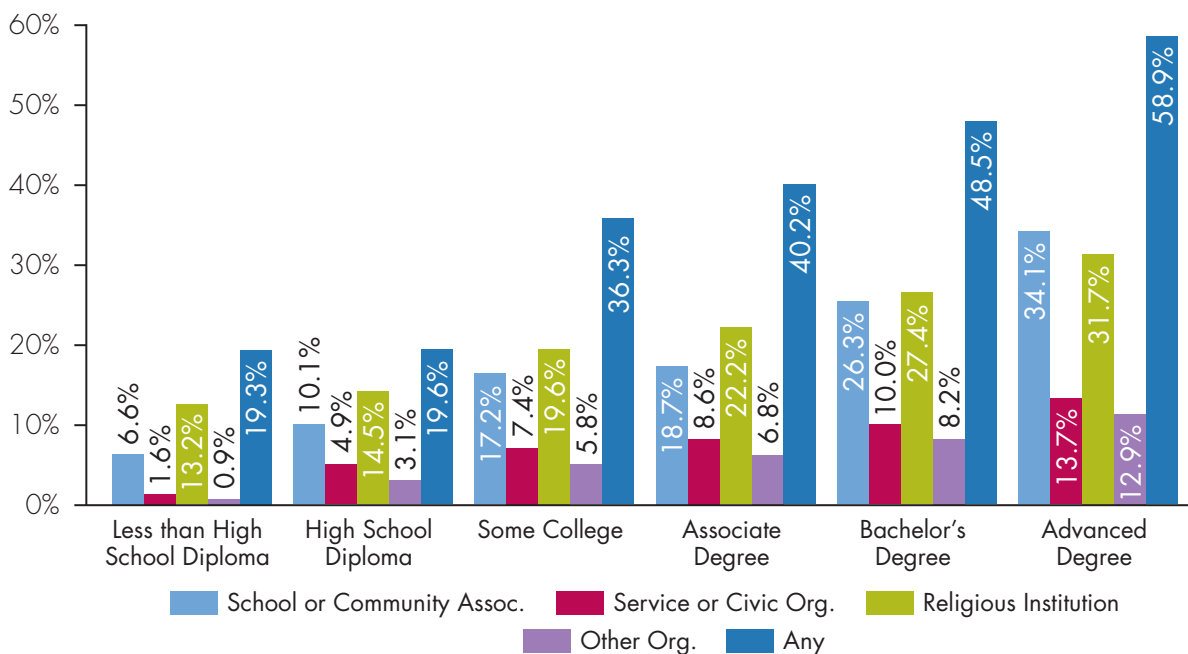
A similar pattern is observed for the proportion reporting that they had contacted or visited a public official to express an opinion in the past year. This measure of political engagement rises from about 7 percent for high school without college, to 14 percent for associate degrees, to 18 percent for bachelor's degrees, to 28 percent for advanced degrees.

The third column in Figure 43 shows the proportion reporting that they discuss politics with family or friends at least a few times a week. This measure of political engagement increases from 23 percent for high school graduates without college, to 30 percent for those with some college and associate degrees, to 39 percent for those with bachelor's degrees but without advanced degrees, to 47 percent for holders of advanced degrees.

Community Involvement

Figure 44 reports the proportions of individuals involved with various types of community organizations in 2011. The first column shows the proportion of working-age individuals participating in "a school group, neighborhood, or community association such as PTA or neighborhood watch group" during the past year. This measure of civic engagement increases substantially with college attainment, rising from 10 percent for high school and no college, to 17 percent for some college and no degree, to 26 percent for bachelor's degrees without advanced degrees.

Figure 44
Participation in Organizations

Legend: School or Community Assoc. | Service or Civic Org. | Religious Institution | Other Org. | Any

	Less than High School Diploma	High School Diploma	Some College	Associate Degree	Bachelor's Degree	Advanced Degree
School or Community Assoc.	6.6%	10.1%	17.2%	18.7%	26.3%	34.1%
Service or Civic Org.	1.6%	4.9%	7.4%	8.6%	10.0%	13.7%
Religious Institution	13.2%	14.5%	19.6%	22.2%	27.4%	31.7%
Other Org.	0.9%	3.1%	5.8%	6.8%	8.2%	12.9%
Any	19.3%	19.6%	36.3%	40.2%	48.5%	58.9%

The pattern across college attainment is consistent for the three other measures of community involvement reported in Figure 44. The proportion participating in "a service or civic organization such as American Legion or Lions Club" in the past year increases from 5 percent for high school and no college to 10 percent for bachelor's degrees. The proportion participating in "a church, synagogue, mosque or other religious institution organization, NOT COUNTING (your/his/her) attendance" in the past year increases from 14.5 percent for high school to 27 percent for bachelor's degrees. The proportion participating in other types of organizations (not including recreation clubs) rises from 3 percent for high school to 8 percent for bachelor's degrees.

The last column in Figure 44 reports participation in any of the four types of community organizations shown. Participation in some type of community organization during the past year increases from about 26 percent of high school graduates without college, to about 36 percent of those with some college but no degree, to more than 48 percent of those with bachelor's degrees but no advanced degree, to 59 percent of those with advanced degrees.

A similar pattern is also observed in participation in recreation clubs (not shown). The proportion participating in "a sports or recreation organization such as a soccer club or tennis club" in the past year is 7.0 percent for high school, 11.4 percent for some college, 13.0 percent for associate degrees, 19.5 percent for bachelor's degrees, and 22.7 percent for graduate degrees.

A similar increasing pattern with college attainment is observed for leadership in community organizations (not shown). The proportion of those ages 27 to 67 in 2011 reporting having "served on a committee or as an officer of any group" in the past year increases from 5.4 percent for high school, to 9.9 percent for some college, to 12.3 percent for associate degrees, to 17.5 percent for bachelor's degrees, to 26.3 percent for graduate degrees.

Figure 45 reports two measures of community involvement from the September 2012 Volunteer Supplement of the Current Population Survey. The first column is the proportion answering that they have "worked with people in (their) neighborhood to fix or improve something" in the past year. As with the other measures of community involvement, it increases substantially with college attainment. The proportion working on a community project rises from 6 percent of high school graduates without college, to 9 percent of those with some college but no degree, to 13 percent of those with bachelor's degrees but not advanced degrees.

The second column in Figure 45 is the percentage who have "attended any public meetings in which there was discussion of community affairs" in the past year. Its pattern across college attainment is slightly stronger than the first measure of community involvement. The proportion of high school graduates without college attending a community meeting within the past year is almost 6 percent. This proportion rises to nearly 15 percent for bachelor's graduates without advanced degrees, and to 20 percent for those with advanced degrees.

Figure 45
Community Involvement
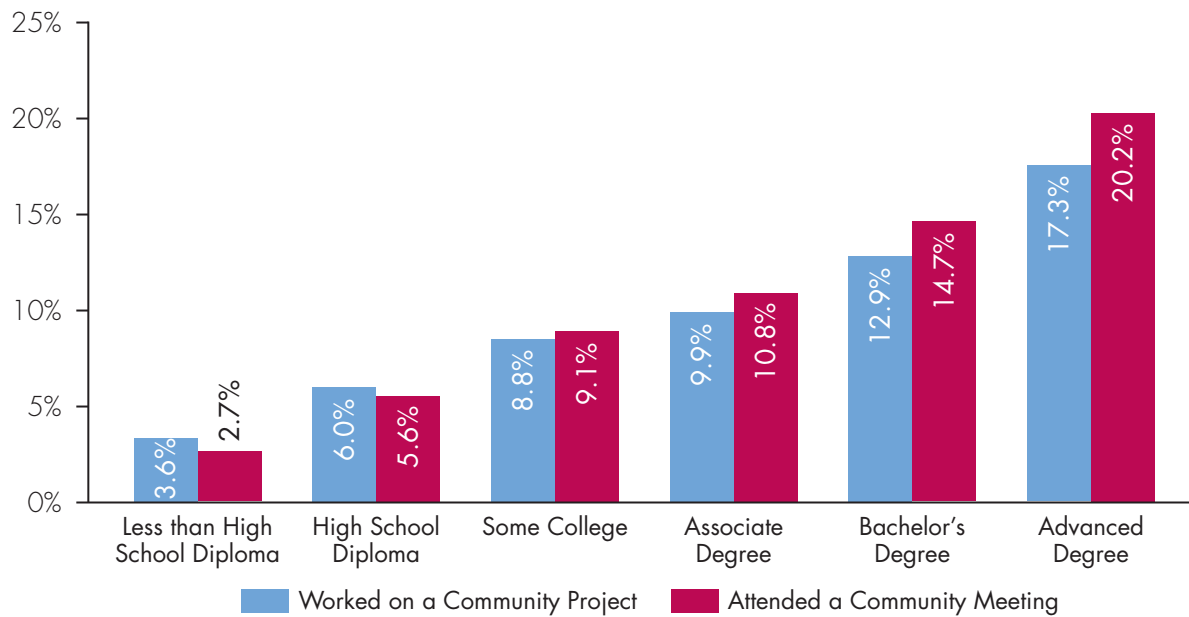
Worked on a Community Project   Attended a Community Meeting

Source: Author's calculations using the September 2012 Volunteer Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N = 60,336 or more.

Social Capital

Bourdieu (1986) and Coleman (1988) popularized the term "social capital" (although both the basic concept and the term have a much longer history), but it was the work of Putnam (1993, 2000) quantifying the important beneficial effects of social capital that sparked considerable recent interest in the concept.

Although "social capital" increasingly enters into academic and popular discussions, it defies a standard definition or a standard measurement. The back cover of Halpern's (2005) book defines social capital as "the social networks, informal structures and norms that facilitate individual and collective action," while a definition is avoided within the book. Social capital is difficult to define precisely because it is generally understood to be a broad and multifaceted concept, which also makes it particularly difficult to measure.

Several measures have been used as approximate metrics of social capital, or at least reflective of social capital. Indeed, the measures of civic engagement just examined, such as participation in community organizations, have often been used as metrics representing social capital. Thus, the results in the last section showing that college attainment significantly increases civic engagement can be interpreted as showing that college attainment creates social capital.

Figure 46 illustrates some other measures reflecting social capital. In particular, it shows three measures of interactions with neighbors from the November 2011 Civic Engagement Supplement of the Current Population Survey.
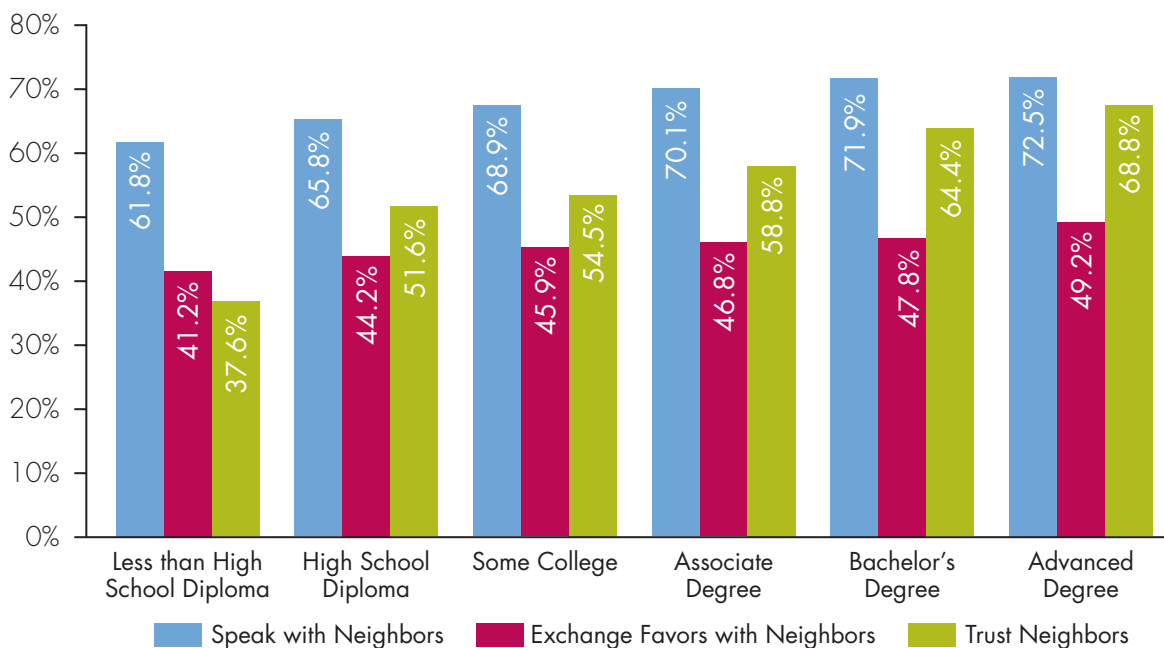
The left column in Figure 46 shows the proportion who reported talking with neighbors at least a few times a month. This proportion rises from 66 percent for high school, to 69 percent for some college and no degree, to 72 percent for bachelor's degrees.

The middle column in Figure 46 shows the proportion reporting exchanging favors (such as watching children, helping with shopping, house sitting, lending tools and other small helping gestures) at least once a month. This proportion rises from about 44 percent for high school, to 46 percent for some college, to 48 percent for bachelor's degrees.

The right column in Figure 46 shows a measure, trusting others, that is used particularly frequently as a proxy for social capital. This measure is the proportion of those who reported trusting at least most of the people in their neighborhood. Of the three neighborhood measures, this one reveals the most pronounced increase with college attainment. The proportion of high school graduates without college who trust at least most of their neighbors is less than 52 percent, compared to nearly 59 percent of those with associate degrees and nearly 69 percent of those with advanced degrees.

It would be interesting to uncover how much of the college effect in neighborhood trust is due to intrinsic trust versus living in better neighborhoods. Results in Oreopoulos and Salvanes (2011), however, are suggestive that it is intrinsic trust that drives the observed correlation with education. They find that controlling for differences in income, which is likely to strongly affect the choice of neighborhood, has very little effect on the correlation between education and trust. Moreover, the trust question that they examined from the U.S. General Social Surveys is more general and does not ask about neighbors, and it reveals an even stronger correlation with education attainment than shown in Figure 46.

Figure 46
Interactions with Neighbors

Speak with Neighbors
- Less than High School Diploma: 61.8%
- High School Diploma: 65.8%
- Some College: 68.9%
- Associate Degree: 70.1%
- Bachelor's Degree: 71.9%
- Advanced Degree: 72.5%

Exchange Favors with Neighbors
- Less than High School Diploma: 41.2%
- High School Diploma: 44.2%
- Some College: 45.9%
- Associate Degree: 46.8%
- Bachelor's Degree: 47.8%
- Advanced Degree: 49.2%

Trust Neighbors
- Less than High School Diploma: 37.6%
- High School Diploma: 51.6%
- Some College: 54.5%
- Associate Degree: 58.8%
- Bachelor's Degree: 64.4%
- Advanced Degree: 68.8%

Source: Author's calculations using the November 2011 Civic Engagement Supplement of the Current Population Survey, ages 27-66 and not enrolled in college, N equals about 54,000 for the first two questions and 28,948 for the trust question.

All three neighborhood measures illustrated in Figure 46 increase monotonically with college attainment. This, along with the results for the civic-engagement measures, suggests that an important social benefit of college education is that it creates social capital. For more on this idea see Knack and Keefer (1997).

Concluding Remarks

This report has highlighted numerous benefits of college education. But it is important to keep in mind that these are just the (imperfectly) measurable effects of college attainment. It is easy to get lost in all of the numbers presented in this report and lose sight of the larger picture. Many of the benefits of college education cannot be measured adequately. The lack of quantification does not make these benefits any less real or any less important. Unfortunately, though, measurability does seem to affect perceptions of these benefits.

The most important virtues of college education are probably those that were stressed initially and long before there was measurement of social phenomena. In its purest form, traditional college education teaches critical thinking, self-examination and open-mindedness. It encourages exploration into new ways of understanding and cultivates creativity, innovation, tolerance, inclusivity and diversity. Nussbaum (2007) summarized the ancient Stoic notion of education as "liberating the mind from the bondage of habit and custom to produce people who can function with sensitivity and alertness as citizens of the whole world." This is the real virtue of college education, and the full manifestation of the benefits from it could never be measured completely. Nonetheless, a list of the measurable benefits of college education is long.

Numerous measures indicate that social engagement increases significantly with college attainment. Simply put, college education improves the society in which we live. College attainment not only leads to higher incomes of those going to college, it raises others' incomes. College attainment benefits the rest of society through increased tax contributions for public services and reduced needs for public services. It reduces crime, thus making our communities safer. It increases generosity. It improves democratic and civic participation. It raises awareness and involvement in our communities.

Moreover, I do not think it is an exaggeration to say that engagement in life increases significantly with college attainment. Not only are college graduates usually more involved in their communities and more giving and trusting; they are more likely to be successfully married. College graduates are more likely to be gainfully employed, and work in more prestigious and safer occupations. They are less likely to live in poverty, experience credit and banking problems, wind up in prison, suffer through divorce, or face the angst of unemployment. They are generally healthier and more active, and they're less likely to live with severe disabilities. College graduates generally have longer and more fulfilling lives.

College attainment is about much more than just the money. Indeed, the additional earnings associated with college attainment pale in comparison with the other benefits to individuals and to the rest of society. The college earnings premium is the tip of the iceberg.

Yet, the financial payoff to college degrees gets the lion's share of the attention. In a sense, the high financial return to investment in college education is a curse. It deflects attention from the harder-to-quantify benefits that may be more important. Moreover, emphasis on the high private return to college education promotes the perception that college education is primarily a private good.

The fact that college education is a great investment, on average, just in terms of the private benefits also allows "taxpayer free riding." In our role as taxpayers, we receive substantial benefits from others' college attainment (i.e., fiscal externalities, productivity externalities, philanthropic

externalities, crime externalities, and social capital externalities). Thus, we receive a net benefit from paying taxes to provide public support for higher education. But if most families already have sufficient incentive and ability to invest in college education without public support, then we can still benefit from college attainment without contributing our tax dollars.

Emphasizing only the private return on investments in a college education fuels the problem of taxpayer free riding, and encourages the continuing decline in public support for higher education.

References

Acemoglu, D. & Angrist, J. (2001). How large are human-capital externalities? Evidence from compulsory schooling laws. *NBER Macroeconomics Annual 2000, 15*, 9-59.

Aughinbaugh, A., Robles, O., & Sun, H. (2013). Marriage and divorce: patterns by gender, race, and educational attainment. *Monthly Labor Review.* Washington DC: Bureau of Labor Statistics.

Autor, D. H., Katz, L. F., & Kearney, M. S. (2008). Trends in U.S. wage inequality: revising the revisionists. *Review of Economics and Statistics, 90(2),* 300-323.

Baum, S. & Payea, K. (2004). *Education pays: the benefits of higher education for individuals and society.* Washington DC: College Board.

Blanchflower, D. G & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics, 88(7-8),* 1359-1386.

Blanchflower, D. G. & Oswald, A. J. (2011). International Happiness: a new view the measure of performance. *Academy of Management Perspectives, 25(1),* 6-22.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (ed.) *Handbook of theory and research for the sociology of education.* New York: Greenwood.

Card, D. (1999). The causal effect of education on earnings. In O. Ashenfelter & D. Card (eds.), *Handbook of labor economics, Vol. 3A.* Amsterdam: Elsevier.

Carneiro, P. & Lee, S. (2011). Trends in quality-adjusted skill premia in the United States, 1960-2000. *American Economic Review, 101(6),* 2309-2349.

Ciccone, A. & Peri, G. (2006). Identifying human-capital externalities: theory with applications. *Review of Economic Studies, 73(2),* 381-412.

Clark, D. & Royer, H. (2013). The effect of education on adult mortality and health: evidence from Britain. *American Economic Review, 103(6),* 2087-2120.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94(S),* S95-S120.

Conti, G., Heckman, J., & Urzua, S. (2010). The education-health gradient. *American Economic Review, 100(2),* 234-238.

Cutler, D. M. & Lleras-Muney, A. (2008). Education and health: evaluating theories and evidence. In R. F. Schoeni, J. S. House, G. A. Kaplan, & H. Pollack (eds.) *Making Americans healthier: social and economic policy as health policy.* New York: Russell Sage Foundation.

Cutler, D. M. & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of Health Economics, 29(1),* 1-28.

Davis, C. et al. (2013). *Who pays? A distributional analysis of the tax Systems in all 50 states, 4th Ed.* Washington DC: Institute on Taxation and Economic Policy.

de Haan, M. (2011). The effect of parents' schooling on child's schooling: a nonparametric bounds analysis. *Journal of Labor Economics, 29(4),* 859-892.

Dee, T. S. (2004). Are there civic returns to education? *Journal of Public Economics, 88(9-10),* 1697-1720.

Deere, D. R. & Vesovic, J. (2006). Educational wage premiums and the U.S. income distribution: a survey. In E. A. Hanushek & F. Welch (eds.) *Handbook of the economics of education, Vol. 1.* Amsterdam: Elsevier.

Eide, E. R. & Showalter, M. H. (2011). Estimating the relation between health and education: what do we know and what do we need to know? *Economics of Education Review, 30(5),* 778-791.

Everett, B. G., Rehkopf, D. H., & Rogers, R. G. (2013). The nonlinear relationship between education and mortality: an examination of cohort, race/ethnic, and gender differences. *Population Research and Policy Review, 32(6),* 893-917.

Freeman, R. B. (1975). Overinvestment in college training? *Journal of Human Resources, 10(3),* 297-311.

Freeman, R. B. (1976). *The overeducated American.* New York: Academic Press.

Furnée, C. A., Groot, W., & Massen van den Brink, H. (2008). The health effects of education: a meta-analysis. *European Journal of Public Health, 18(4),* 417-421.

Glaze, L. E. & Parks, E. (2012). *Correctional populations in the United States, 2011.* Washington DC: Bureau of Justice Statistics.

Groot, W. & Massen van den Brink, H. (2007). The health effects of education. *Economics of Education Review, 26(2),* 186-200.

Grossman, M. (2006). Education and nonmarket outcomes. In E. A. Hanushek & F. Welch (eds.) *Handbook of the economics of education, Vol. 1.* Amsterdam: Elsevier.

Hadley, J., Holahan, J., Coughlin, T., & Miller, D. (2008). Covering the uninsured in 2008: current costs, sources of payment, and incremental costs. *Health Affairs, 27(5),* W399-W415.

Halpern, D. (2005). *Social capital.* Cambridge: Polity Press.

Harlow, C. W. (2003). *Education and correctional populations.* Washington DC: Bureau of Justice Statistics.

Harmon, C., Oosterbeek, H., & Walker, I. (2003). The returns to education: microeconomics. *Journal of Economic Surveys, 17(2),* 115-56.

Haveman, R. H. & Wolfe, B. L. (1984). Schooling and economic well-being: the role of nonmarket effects. *Journal of Human Resources, 19(3),* 377-407.

Holmlund, H., Lindahl, M., & Plug, E. (2011). The causal effect of parents' schooling on children's schooling: a comparison of estimation methods. *Journal of Economic Literature, 49(3),* 615-651.

Hummer, R. A. & Lariscy, J. T. (2011). Educational attainment and adult mortality. In R. G. Rogers & E. M. Crimmins (eds.) *International handbook of adult mortality.* New York: Springer.

Institute for Higher Education Policy. (1998). *Reaping the benefits: defining the public and private value of going to college.* Washington, DC: Author.

Institute for Higher Education Policy. (2005). *The investment payoff: a 50-state analysis of the private and public benefits of higher education.* Washington, DC: Author.

Iranzo, S. & Peri, G. (2009). Schooling externalities, technology, and productivity: theory and evidence from U.S. states. *Review of Economics and Statistics, 91(2),* 420-431.

Knack, S. & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics, 112(4),* 1251-1288.

Lange, F. & Topel, R. (2006). The social value of education and human capital. In E. A. Hanushek & F. Welch (eds.) *Handbook of the economics of education, Vol. 1.* Amsterdam: Elsevier.

Lleras-Muney, A. (2005). The relationship between education and adult mortality in the United States. *Review of Economic Studies, 72(1),* 189-221.

Lochner, L. (2011). Non-production benefits of education: crime, health, and good citizenship. In E. A. Hanushek, S. Machin, & L. Woessmann (eds.). *Handbook of the economics of education, Vol. 4.* Amsterdam: Elsevier.

Lochner, L. & Moretti, E. (2004). The effect of education on crime: evidence from prison inmates, arrests, and self-reports, *American Economic Review, 94(1),* 155-189.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics, 22(1),* 3-42.

McMahon, W. W. (2004). The social and external benefits of education. In G. Johnes & J. Johnes (eds.). *International handbook on the economics of education.* Cheltenham UK: Edward Elgar.

Meara, E. R., Richards, S., & Cutler, D. M. (2008). The gap gets bigger: changes in mortality and life expectancy, by education, 1981-2000. *Health Affairs, 27(2),* 350-360.

Michael, R. T. (1972). *The effect of education on efficiency in consumption.* New York: Columbia University Press.

Milligan, K., Moretti, E., & Oreopoulos, P. (2004). Does education improve citizenship? Evidence from the United States and the United Kingdom. *Journal of Public Economics, 88(9-10),* 1667-1695.

Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association, 291(10),* 1238-1245.

Moretti, E. (2004). Estimating the social return to higher education: evidence from longitudinal and repeated cross-sectional data. *Journal of Econometrics, 121(1-2),* 175-212.

Nie, N. H., Junn, J., & Stehlik-Barry, K. (1996). *Education and democratic citizenship in America.* Chicago: University of Chicago Press.

Nussbaum, M. (2007). Cultivating humanity and world citizenship. In *Forum Futures 2007.* Cambridge MA: Forum for the Future of Higher Education.

Oreopoulos, P. & Salvanes, K. G. (2011). Priceless: the nonpecuniary benefits of schooling. *Journal of Economic Perspectives, 25(1),* 159-184.

Oswald, A. J. & Wu, S. (2011). Well-being across America. *Review of Economics and Statistics, 93(4),* 1118-1134.

Pronzato, C. (2012). An examination of paternal and maternal intergenerational transmission of schooling. *Journal of Population Economics, 25(2),* 591-608.

Putnam, R. D. (1993). *Making democracy work: civic tradition in modern Italy.* Princeton NJ: Princeton University Press.

Putnam, R. D. (2000). *Bowling alone: the collapse and revival of American community.* New York: Simon and Schuster.

Rauch, J. E. (1993). Productivity gains from geographic concentration of human capital: evidence from the cities. *Journal of Urban Economics, 34(3),* 380-400.

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy, 98(5),* S71-S102.

Stevenson, B. & Wolfers, J. (2007). Marriage and divorce: changes and their driving forces. *Journal of Economic Perspectives, 21(2),* 27-52.

Synder, T. D. & Dillow, S. A. (2014). *Digest of Education Statistics 2013.* Washington: National Center for Education Statistics.

Synder, T. D., Dillow, S. A., & Hoffman, C. M. (2009). *Digest of Education Statistics 2008.* Washington: National Center for Education Statistics.

Trostel, P. A. (2010). The fiscal impacts of college attainment. *Research in Higher Education, 51(3),* 220-247.

Trostel, P. & Walker, I. (2006). Education and work. *Education Economics, 14(4),* 381-403.

Wolfe, B. L. & Haveman, R. H. (2003). Social and nonmarket benefits from education in an advanced economy. In Y. Kodrzycki (ed.), *Education in the 21st century: meeting the challenges of a changing world.* Boston: Federal Reserve Bank of Boston.