



Does College Pay?



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Listen to accompanying audio clips to hear stories from people who will help show you that you're on the right path.

In the current job market it's easy to get discouraged and wonder whether the money spent on college will really pay. If you're going to graduate and work for minimum wage, why shell out tuition? And then there are stories of successful people who didn't go to college. Why not take that path?

Behind these extremes are individuals—maybe you—trying to decide if college makes financial sense. Making a good decision requires knowing some basics. Does a college degree translate into higher earnings? Will the extra earnings be enough to pay for your investment? How long will it take to cover the cost? And, do you really need a college degree to climb the economic ladder?

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The experience of workers with and without a college degree provides clear answers. The boost to earnings from a college degree is large and persistent. The average college graduate earns enough “extra” to recover the cost of attending most colleges in fewer than 15 years. After that, the earnings advantage remains, leaving the typical college graduate with a significant net return. All of this leads to greater economic opportunities over a lifetime, particularly for people who start out in the bottom half of the income distribution.

The College Earnings Advantage

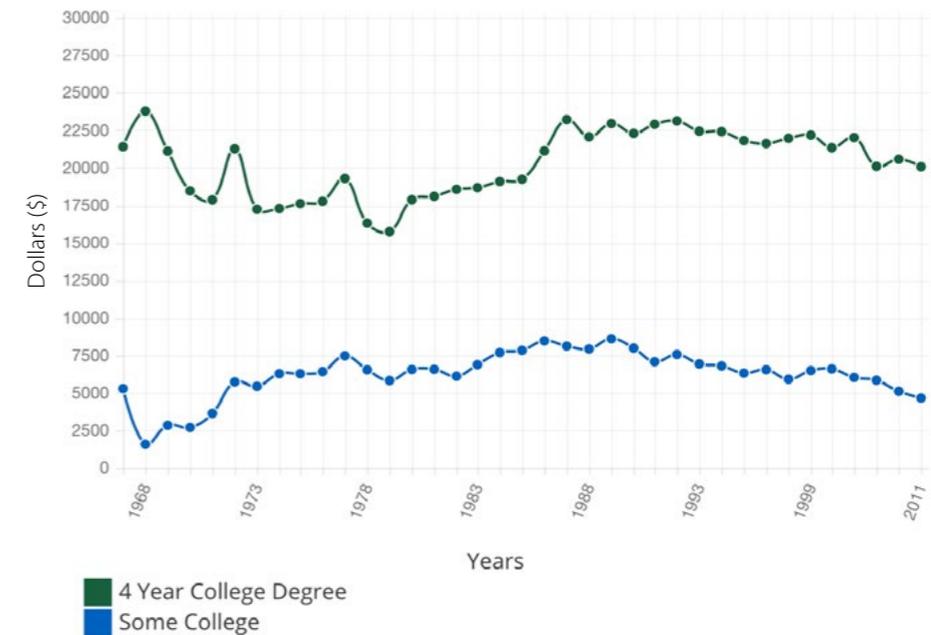
A simple way to see the economic benefit of a college degree is to compare how much college graduates earn relative to high school graduates. Figure 1 shows the annual earnings premium for college graduates relative to high school graduates from 1968 through 2011, adjusted for inflation and based on data from the Panel Study of Income Dynamics (PSID). The payoff from a college degree is apparent. Over the past 40 years, the college earnings premium has averaged about \$20,300 per year. And while the exact value varies over time, college graduates always earn more. At its lowest point in 1980, the premium was about \$15,750 in extra income per year. In 2011, the latest date in our sample, the average worker with a college degree earned about \$20,000 more per year than the average high school graduate. These findings are consistent with other studies (see “For Further Reading” at the end of the essay to learn more).

An important point is that a four-year degree is what really matters, rather than having just some higher education. As Figure 1 shows, the premium is much smaller for workers with some college but no four-year degree.

Did the Recession Change Things?

Recent college graduates will tell you, it’s tough out there. The latest recession was especially hard on young people, and college graduates were not immune. Still, the downturn and its aftermath highlight the *insurance* a college degree provides. College graduates faced unemployment rates about half as high as those for high school graduates. College grads also fared better on pay. Pay cuts were less severe for college grads on average than for other groups. And average hourly earnings point to a [faster recovery in salary growth for college graduates](#) than for high school graduates in 2012 and 2013.

Figure 1
Earnings Premium Over High School Education



Source: PSID and authors' calculations. Premium defined as difference in mean annual labor income.

“The average college graduate earns enough ‘extra’ to recover the cost of attending most colleges in fewer than 15 years.”

It's also important to remember that investing in college, like investing in a house or a business, is a long-term prospect. As Figure 2 shows, new college graduates start out earning just a little more (\$5,000 to \$6,000) than high school graduates. Over time, this earnings gap grows markedly, so that after 15 years it's over \$25,000 per year. This means that comparing the current salaries of recent college graduates with those of people who started working right after high school won't tell you that much about the future. Things will look much different 10, 20, and 30 years from now when the college investment has had enough time to pay dividends. Whether you launch a career in a boom or a recession, a college degree is an asset that becomes more valuable over the course of your work life.

All told, college offers a lot of financial benefits. It delivers higher earnings year to year, provides some insurance against ups and downs in the economy, and translates into greater prosperity over a lifetime of work. And as the audio interviews accompanying this essay demonstrate, the financial benefits are only part of the story.

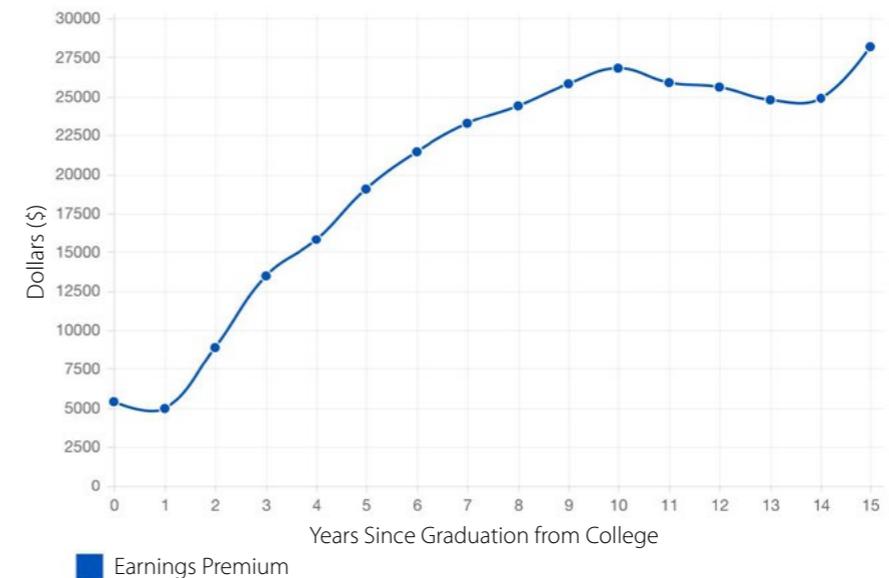
Will the Benefits Cover the Costs?

Around many kitchen tables, the discussion isn't about the value of college, but about how much it costs. In other words, will the benefits justify the expense? The answer is almost always yes. Here's why.

The cost of college is tuition and fees, plus the lost earnings from forgoing work to attend school. The payoff is the discounted accumulated lifetime earnings difference between college and high school graduates. As the box below, [Computing the Return on College](#), shows a graduate paying \$9,000 a year in tuition incurs a total cost of \$112,194 (four years of tuition and fees plus forgone earnings). Assuming that same graduate earns the average premium that comes with a college degree, about \$20,000 per year, the discounted life time benefits would total about \$534,000. Subtracting the costs from the benefits yields a net return on college of over \$420,000.

Of course, any individual's return on college depends on the actual costs incurred from attending and the earnings secured after graduation. But for the average person, the calculation is clear: college pays.

Figure 2
College Earnings Premium by Age



Source: PSID and authors' calculations. Premium defined as difference in mean annual labor income of college graduates in each year since graduation and earnings of high school in years since graduation plus four. Values are three-year centered moving averages of annual premiums.

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Early Elias

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How Long Will It Take to Earn Back Your Investment?

It is clear that, over a lifetime, college pays. But how long before the investment is in the black? This too is straightforward to calculate. The “breakeven” year—that is, the year when the accumulated earnings premium from college equals the cost associated with graduating—depends on two things: tuition costs and the college earnings premium. Assume the earnings premium is the average paid each year after graduation, as in Figure 2. Figure 3 shows breakeven years for different amounts of annual tuition, again adjusted for inflation and the changing value of money over time.

According to the data, students paying \$9,000 in annual college tuition for four years can break even and begin earning additional returns in nine years. This means that someone who graduates at age 22 and works full-time each year after that will be able to pay for the investment by age 31. From then on, the wage premium that comes with a college degree is extra income that can be spent or saved. It’s important to note that, while \$9,000 may not sound like the astronomical tuitions at some prestigious institutions, it covers about 46 percent of annual admissions at public four-year institutions in 2014, according to the College Board (Table 1). And research finds no definitive evidence that higher tuition leads to superior results for all students (see “For Further Reading”).

Of course, the more college costs, the longer it takes to break even. But, as the figure shows, even when tuition reaches \$45,000 per year, which covers nearly all public colleges and universities in the U.S., the costs can be recouped in 17 years. For those who graduate at age 22, this means the investment is paid in full before age 40.

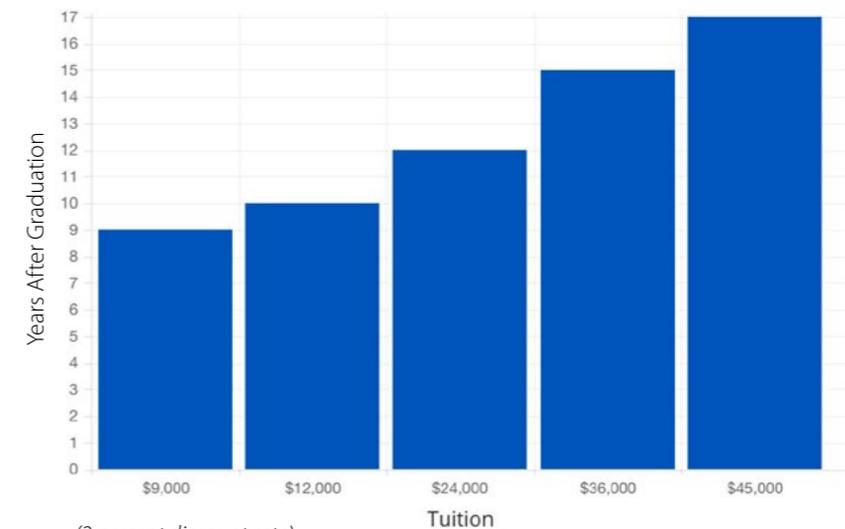
To calculate your own breakeven year, use our [calculator](#), “Is College Worth It?”

Is a College Degree Really Necessary?

Every day we hear stories of people who started at the bottom of the economic ladder and rose to the top through determination, hard work, and talent. This mobility is an important part of our culture and contributes to the vitality of the American economy.

In most cases, it also requires a college degree.

Figure 3
Years to Break Even at Different Tuitions



(2 percent discount rate)

Source: PSID and authors’ calculations

Table 1
College Tuition and Fees in 2014

Tuition	Admissions at Nonprofit Four-Year Institutions	
	Public	Private
\$9,000	46%	8%
\$12,000	71%	10%
\$24,000	93%	19%
\$36,000	>99%	61%
\$45,000	>99.9%	83%

Source: PSID, authors’ calculations, College Board’s “Trends in College Pricing 2014”

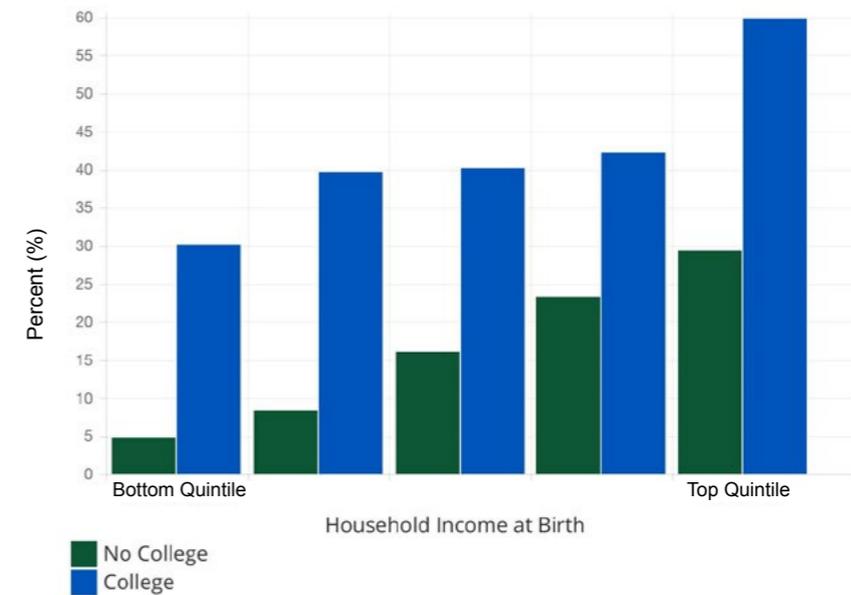
No matter where a person starts, going to college increases the chances of moving up the economic ladder. Figure 4 shows the percent of people who make it to the top 20 percent of the U.S. household income distribution by where they started and whether they went to college. For those born into households near the bottom of the income distribution, a college degree is the difference in reaching or not reaching the top. Graduates from the bottom 20 percent are over six times as likely to reach the top than those who don't go to college. The impact is also striking for those born into the second lowest 20 percent; their chances of getting to the top are five times higher with a college degree. Notably, even those born into the very top of the income distribution are more likely to stay there if they have a college degree. Read more about the role of college in economic mobility in [Daly and Bengali 2013](#), and watch a video on the [San Francisco Fed's Economic Education YouTube Channel](#).

The importance of college is likely to grow in the future. Technology and globalization are making labor markets more competitive. Employers are looking more and more for workers with established skills and credentials. And the well-educated baby boom generation is nearing retirement, which will leave high-skilled positions vacant and increase the demand for college educated workers.

Is College Right for You?

The data tell a compelling story: College is an excellent investment for most people. A college degree comes with higher earnings, some insurance from the ups and downs in the economy, and a path up the economic ladder. In a changing economy, a college degree also provides a strong foundation to build on, whether that means launching a career, starting a business, or pursuing an even higher degree. Without one, success is just harder, at least for most of us.

Figure 4
Chances of Getting to the Top as an Adult



Source: PSID and authors' calculations

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Computing the Return on College

Deciding whether college is a good investment means weighing the value against the costs of attending.

Costs: tuition + fees + forgone earnings while attending school

Benefits: accumulated earnings difference between college and high school graduates

Since the costs and benefits accrue at different times, an accurate calculation of the net return needs to adjust for the changing value of money over time by taking the discounted net present value. This way, we can compare values from different times on one scale.

Formula for Net Present Value (NPV) for an amount in n years, with discount factor i :

$$NPV_{\text{year } n} = \frac{\text{Amount}}{(1+i)^n} = \frac{\text{Benefits} - \text{Costs}}{(1+i)^n}$$

Formula for Net Present Value of many values over n years: $NPV_{\text{year } 0} + NPV_{\text{year } 1} + NPV_{\text{year } 2} + \dots + NPV_{\text{year } n}$

Here is an example:

Jamie pays \$9,000 per year in tuition and fees. If she had not gone to college, she could have worked and earned \$19,887 per year, the average earnings of a high school graduate in 2011 based on the Panel Study of Income Dynamics.

Adding these costs together and taking the present discounted value assuming a discount factor of 2%, the total cost of college is **\$112,194**.

Total Cost = $(\$9,000 + 19,887) \times (1 + r + r^2 + r^3) = \$112,194$,

where r is the percentage of value that remains after each passing year. We calculate r using the discount factor:

$$r = \frac{1}{1+2\%} = \frac{1}{1.02} = 0.9804$$

With a college degree, Jamie earns an average of **\$20,070** more per year over her lifetime than she would have earned had she stopped with a high school degree.

Taking the present discounted value of her college earnings advantage over her 42 years of work (age 23 to 65), she earns a college benefit of **\$533,988**.

Total Benefit = $(\$20,070) \times (r^4 + r^5 + \dots + r^{44} + r^{45}) = \$533,988$

Putting the two together, Jamie's net return on college is **\$421,794**.

Net Return = $\$533,988 - \$112,194 = \$421,794$

Adapted from "[Is It Still Worth Going to College?](#)" by Leila Bengali and Mary C. Daly, *FRBSF Economic Letter* 2014-13.

For Further Reading

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