SPECIAL REPORT

TD Economics

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GIVING IT THE OLD COLLEGE TRY

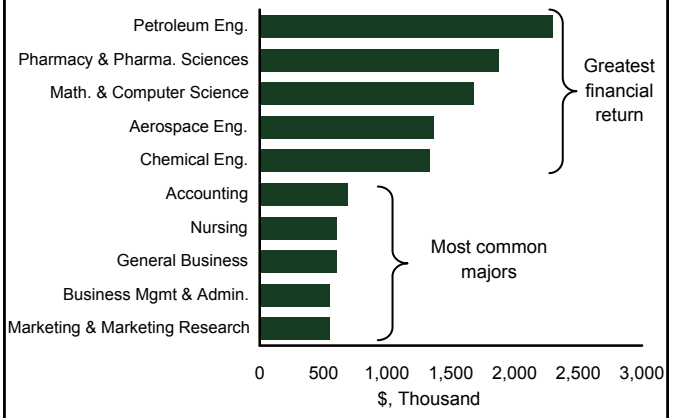
ASSESSING THE RETURNS ON U.S. HIGHER EDUCATION

Highlights

- Students (and parents) wondering whether it's worth taking on student debt to pursue a four-year college degree should know that the median net present value for a bachelor degree is $420,000.
- By comparison, the average student debt load across all age groups and education is $24,803, demonstrating that student loans fund an investment with a higher financial payoff over a lifetime.
- A four-year bachelor degree is an economically worthwhile investment for an overwhelming 97% of majors, relative to those opting to enter the labor force with only a high school diploma. But, choice matters. The financial return varies greatly by major, rising to as high as $2.3 million for petroleum engineering.
- The financial gains are materially eroded if prospective students fail to graduate, and to a lesser extent if the period to obtain the undergraduate degree is extended.

U.S. student debt has almost tripled from 2004 to 2012 and the tally now exceeds all other forms of household credit, with the one exception of mortgages. This has left many parents and students wondering what the bang-for-the-buck is for a college education in an economic environment that offers little assurance of landing a suitable job immediately upon graduation. Even in this soft job market, there is a compelling argument to pursue postsecondary education. Unlike credit card debt used for the purchase of discretionary items – like a television – student loans fund a permanent investment in skills that yield a higher lifetime return on income. Poor economic times still greatly advantage the average college graduate relative to those with only a high school diploma, and this is true broadly by type of postsecondary degree. By our estimates, an overwhelming 97% of majors provide a return on income in excess of high school graduates, even when we took into account the extra four years a college student is absent from the labor market and the cost of education during this period. The median net present value of a student graduating in four years with a bachelor's degree and working for the next 40 years to retirement is roughly $420,000 relative to entering the workforce immediately after high school. Not surprisingly, the lifetime return from education is generally higher for engineering and technical degrees, and lower for certain arts and social majors.

CHART 1. NET PRESENT VALUE OF A BACHELOR DEGREE*



Source: "What's it Worth", Georgetown University Center on Education and the Workforce, BLS, US Dept. of Education, TD Economics; *present value of earnings above those of individuals holding only a HS diploma, incl. cost of education.

For those of us who remember being scolded for going out on a school night, playing marathon sessions of video games, or coming home late with not-so-subtle reminders that "education is the best investment you can make in yourself" – well, our parents were right.

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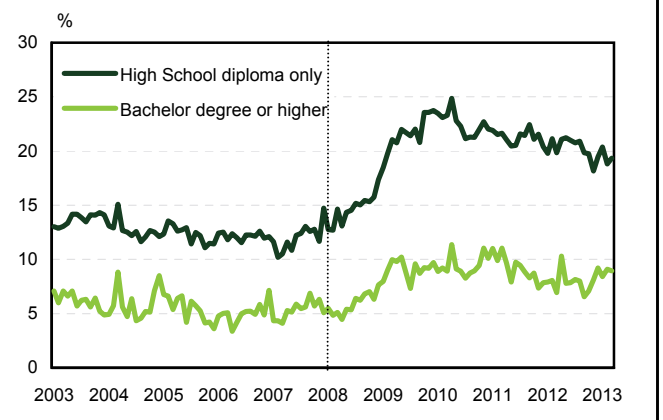
CHART 2. UNEMPLOYMENT RATE OF 16-24 YEAR OLDS



Source: Labor Force Statistics from the Current Population Survey, BLS.
Seasonally-adjusted by TD Economics. Refers to 16-24 year olds not enrolled in school.

The SLUR factor

What is the SLUR factor? We're not talking about Thursday night at the college pub. It's an easy reminder of the two key arguments favoring a college education: Salaries and Lower Unemployment Rates.

Starting with the latter, the unemployment rate for a person 25 years or older with a college degree (Bachelor or higher) was a mere 3.8% in March 2013. Compare that with 7.6% for a high school graduate. Of course, this may be of little consolation to a recent college graduate aged 16 to 24, who faces an unemployment rate of 9.0%[1]. The job market is not one-size-fits all. As one would expect, there is greater demand for those with experience. However, when a new college graduate goes toe-to-toe with a high school graduate in the 16 to 24 age bracket, there is no contest. The latter faces an unemployment rate that is more than double, at 19.3%[2]. What's particularly interesting is that the traditional gap in the unemployment rate between the two groups has widened dramatically since 2008 by roughly 5 percentage points (see chart 2).

But, focusing solely on unemployment rates does not resolve the question as to whether a person is financially better off with a college degree, particularly given the historically high incidence of under-employment in this business cycle. To this we have two arguments. One, based on 2008 Census Bureau statistics that combined full-time and part-time workers, those with a college degree or greater and only 0-4 years experience had a median monthly income two-and-a-half times greater than a high school graduate with equivalent experience[3]. In fact, the income differential is greatest between the two groups in the earliest stages of career development by this measure.

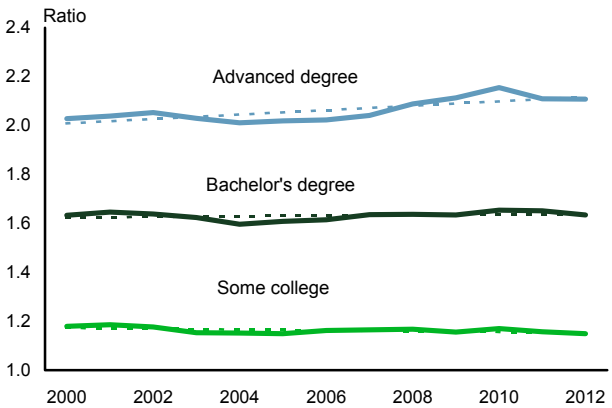
There are many different ways to look at salary statistics, which can get confusing, but the underlying message is that all the data show a strong outperformance of college graduate salaries. For instance, the above statistic is likely skewed by advance degree holders (i.e. post-graduate) and the incidence of part-time workers. So, we looked instead at another set of data that capture 2010 statistics solely on full-time workers, aged 25-34 years and with a bachelor degree only. This showed a wage premium[4] of 1.51 relative to a full-time worker with a high school diploma[5]. Importantly, this wage premium, regardless of age bracket, is relatively recession-resistant. Even though it can compress ever so slightly during weak economic periods, the outperformance persists and the gap eventually rebounds. And, when the data sample is widened to include older and thus, more experienced, bachelor degree holders, the income gap widens to 1.64 (see chart 3).

This latter argument brings us to the second and most important point. It's the long-term return from a college education that offers the greatest advantage relative to a high school graduate. Focusing only on near-term prospects upon graduation is simply too short-sighted.

Education: the investment of a lifetime

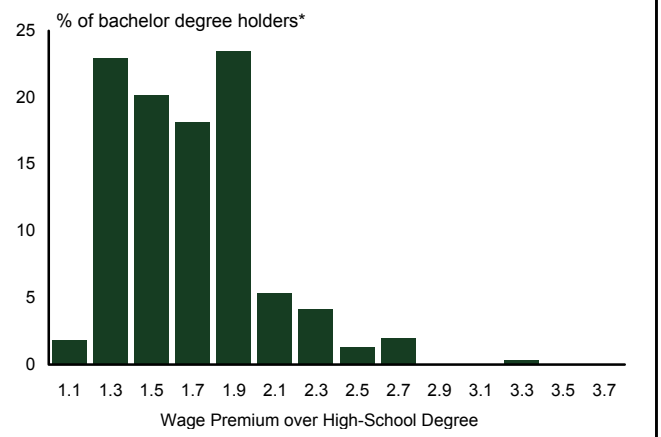
Study after study has offered overwhelming evidence that the returns to a bachelor degree are significantly positive. But, the type of degree matters to that educational return. According to data from the Georgetown University Center on Education and the Workforce, among 153 undergraduate bachelor degree majors, all but one had a wage premium

CHART 3. WAGE PREMIUM OVER HIGH SCHOOL DIPLOMA



Source: U.S. Bureau of Labor Statistics, TD Economics. Note: Wage premium here is calculated for full-time workers 25 years and over.

CHART 4. DISTRIBUTION OF COLLEGE WAGE PREMIUM



*Excludes holders of an advanced degree. Wage premium calculated off median wage data for 153 undergraduate majors. Source: "What's it Worth", Georgetown University Center on Education and the Workforce, BLS, TD Economics

greater than 1 – meaning that the median earnings for a bachelor degree holder were higher than the median earnings of a high-school diploma holder (see chart 4)[6].

The majority of wage premiums were within the 1.3-2.0 range, and a small distinct group had premiums of 2.8 and higher – petroleum engineering had the highest wage premium at 3.68. Thirteen of the top 20 majors by wage premium were specializations within engineering and another four were related to computer science, mathematics or physics.

However, the wage premium alone isn't enough to justify a college education, as there are costs involved to obtain that degree. Many parents are all too familiar with the cost of sending a child to a postsecondary education institution, while students are keenly aware of the opportunity cost of foregoing working income in the years otherwise spent in school. In order to assess the benefits against these costs, we constructed a scenario where a student begins college in 2012, graduates with a bachelor degree four years later, and then works for forty years before retiring. We take into account the net present cost of forgone wages, tuition and living expenses over those four years, which is equivalent to a student forfeiting $170,000 to obtain a bachelor's degree[7]. We then subtract this from the net present value (NPV) of the estimated lifetime earnings in excess of the median earnings of a high school diploma holder. This exercise reveals that the net financial benefit of a college education wins out for an overwhelming 97% of majors.

The median bachelor degree holder has an NPV of roughly $420,000[8]. This represents the additional dollar value today of going to college instead of starting work immediately after graduating high school. For the median student, it's equivalent to writing a check to yourself for this amount today. However, lifetime earnings vary greatly depending on the type of degree (see table). For instance, among the most popular majors, an electrical engineering degree yields over $1,300,000.

In addition, bear in mind that these figures may underestimate the full financial benefit of a college degree, as they do not account for other types of benefits, such as health care, pensions or allotted vacation time that could become more generous with career progression.

One point of note, those majors that yielded the lower financial return for education were predominantly con-

NET PRESENT VALUE OF THE 30 MOST POPULAR MAJORS*

Major	Net Present Value	Major	Net Present Value
Electrical Engineering	$1,308,000	Journalism	$349,000
Mechanical Engineering	$1,167,000	Biology	$320,000
Computer Science	$1,026,000	Communications	$320,000
Economics	$885,000	Criminal Justice and Fire Protection	$320,000
General Engineering	$885,000	History	$320,000
Mathematics	$800,000	English Language and Literature	$264,000
Finance	$744,000	Liberal Arts	$264,000
Accounting	$687,000	Commercial Art and Graphic Design	$179,000
Computer & Information Systems	$659,000	Fine Arts	$179,000
General Business	$603,000	Psychology	$179,000
Nursing	$603,000	Sociology	$179,000
Political Science and Government	$574,000	Phys. Fitness, Parks, Rec. & Leisure	$123,000
Business Management and Admin.	$546,000	General Education	$94,000
Marketing and Marketing Research	$546,000	Elementary Education	$38,000
Multi-Disciplinary or General Science	$461,000	Family and Consumer Sciences	$38,000

Source: "What's it Worth" Georgetown University Center on Education and the Workforce, The College Board, Calculations by TD Economics. *excluding advanced degree holders, most popular based on 2009 American Community Survey data showing the number of Bachelor degree holders with this major.

centrated in the fields of humanities, arts, education and psychology. We would caution in attributing too much to financial gains, as the motivation for education isn't just about the final dollar. Clearly, these are fields of study that offer great societal and personal benefits and the measurement of their benefits are outside the scope of this report.

Pitfalls to avoid

College pays, but like any investment, costly missteps can be made. For instance, the wage premium for some college[9] but no bachelor degree is 1.15, significantly lower than the premium for a four-year degree. Therefore, failing to complete the program of study generates costs for the attempt without the realization of its full financial benefit. Depending on the program chosen or the school attended, this could slip the long-term financial return into negative territory for a number of individuals.

Another important consideration is the length of time required to complete the degree. Data from the U.S. Department of Education shows that among the 2004 cohort, only 58.3% of students at four-year institutions had graduated by the fall of 2010. Time is money. The extra time spent in school represents an additional expense for a student, as well as a higher opportunity cost from delaying entry into the workforce. Take a student who completes a bachelor degree over six years and likewise decides to retire at the same time as those students who complete it in four years. This shortening of career earnings coupled with the additional costs associated with obtaining the degree results in a much-reduced net present value of $300,000. Under this scenario, only 86% of majors stay above the break-even threshold. So, more-often-than-not, a college degree yields a favorable long-term financial return, but taking a scenic route embeds some financial risks.

Of course, some may view the "time is money" argument in another way. Graduating in a weak economy can impart a long-run negative impact on wages from scarring[10]. This phenomenon occurs due to job mismatches when fewer opportunities exist, and this would certainly have been the case for those graduating in 2008 and 2009. In such a situation, spending more time in school and graduating once the economy has improved could lower the compounded impact from wage scarring.

However, the purpose of this report was to analyze the return for a bachelor degree relative to a high school diploma. As noted earlier, the income differential is recession-resistent, meaning that any wage scarring occuring among college gradues is also occuring among high school graduates, thereby keeping the wage premium constant with college graduates. Furthermore, a college graduate must weigh the decision to stay in school for a longer period against the possibility that wage scarring can be eliminated or reduced more quickly if the job recovery allows workers to easily switch into the job and career path they would have originally chosen. If job changes are common and beneficial, then it is more possible that scarring can be quickly overcome[11].

The bottom line is that irrespective of the economic climate, the vast majority of college graduates will earn a higher financial return on education relative to a high school graduate, while also benefiting from lower unemployment rates.

Conclusion

The last several years have seen a significant rise in student debt; while at the same time, the recession has resulted in a challenging environment for new graduates. In a recent TD Economics report titled "School's Out", we addressed the source of the rise, which was materially related to soaring enrollment rates. With the current analysis, we looked at the flip side of the coin, with a focus on the long-term financial benefits that come with a college degree relative to those who enter the workforce after obtaining a high school diploma. The data show that the financial benefits of a college degree grossly outweigh the short-term costs, even within weak economic periods. To a college student, the word "SLUR" should take on new meaning – recession-resistant Salary premium and persistently Lower Unemployment Rates. Although the lifetime financial returns can vary greatly by degree selection, almost all make the grade provided that students recognize the tradeoffs of dropping out or overextending their stay.

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End Notes

1. Source: U.S. Bureau of Labor Statistics. BLS Series LNU04023018, seasonally-adjusted by TD Economics.
2. Source: U.S. Bureau of Labor Statistics. BLS Series LNU04023068, seasonally-adjusted by TD Economics.
3. Source: U.S. Census Bureau, Labor Force Statistics, Employment History Detailed Tables (http://www.census.gov/people/laborforce/publications/employment_history.html).
4. The wage premium is the ratio of the median earnings of a bachelor degree holder to the median earnings of a high school graduate with no college experience. In this report, we exclude advanced degree holders in calculating the wage premium of a bachelor degree.
5. Source: U.S. Department of Education, National Center for Education Statistics, The Condition of Education, Table A-49-1(http://nces.ed.gov/programs/coe/tables/table-er2-1.asp).
6. Data was obtained from: "What's it Worth", by Anthony P. Carnevale, Jeff Strohl and Michelle Melton at the Georgetown University Center on Education and the Workforce, and is sourced from the 2009 American Community Survey.
7. For the average student graduating with a Bachelor degree after 4 years, the net present cost comes out to $170,000 ($77,000 in college costs, and $93,000 in foregone wages). This cost is calculated as the average net price for first-time full-year students at 4-year institutions (source: IPEDS 2010-11) per year for 4 years of schooling, plus the foregone wages of a median high school graduate over this same time period, discounted to the present. Note that the actual cost of education can vary greatly depending on the school attended, as well as the financial situation of the student.
8. Because the numbers are in constant 2012 dollars, we used an annual real discount rate of 2% to obtain a present value of future cash flows. For a given major, the annual earnings of a college graduate are calculated as the product of the median annual earnings of a high school graduate and the college wage premium calculated for this major. Assumptions are that the wage premium is constant over time and that both college and high school earnings rise at the rate as inflation.
9. Includes partial completion of a college degree and associate degrees.
10. Kahn, Lisa B., 2010. "The long-term labor market consequences of graduating from college in a bad economy".
11. Ibid.

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