Benefits of College—By Degrees

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Should everyone go to college? College graduates, especially STEM graduates, earn more than non-college graduates and are on average more productive than those not attending college. That does not mean, however, that a traditional baccalaureate degree is optimal for everyone, nor that most students should pursue STEM disciplines for financial reasons (for example, biological science majors on average earn less than many non-science majors). There are several risk factors in pursuing a degree, including high dropout rates, and those with mediocre academic preparation are particularly susceptible to having poor college outcomes. For some, non-degree postsecondary vocational training may be a better option.

Two propositions regarding American higher education have become quite popular and largely accepted in this century. First, anyone wishing to have a financially and emotionally satisfying adult life must acquire a college education. With the advent of modern technology, success in life is determined, with rare exceptions, by mental capacities and knowledge, not by brute physical strength or manual dexterity.

Second, in particular, for a large portion of Americans, the path to success should be through the STEM disciplines—science, technology, engineering, and math. As we become more governed by technological advances, it is argued, the people who are responsible for those advances have a special and exulted role to play in our society. Some state governments (Florida especially comes to mind) have altered public policies to favor those entering the STEM disciplines.

Let me offer a contrary perspective. I don't think everyone should

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attempt to get a bachelor's degree or more—college is for many persons, but not for everyone. Moreover, while the STEM disciplines are indeed important and vital to an advancing economy and society, we sometimes oversell them, in the process leading some students to make what are probably not optimal career choices.

These are not issues with only a binary choice. It is not "100 percent of persons should go to college and 50 percent or more of them should major in STEM disciplines," versus an alternative "no one should go to college, and certainly no one should study science, math, engineering, computer science, etc." There is a near infinite range of outcomes that are possible—70 percent vs. 40 or 20 percent of adults with college degrees, for example.

As an economist, I am acutely aware of the Law of Diminishing Returns. When you add more and more of one resource, say farmers who are producing wheat, to a fixed quantity of other resources (say land), output will at some point start rising at a diminishing rate. The first farmer can produce 100 bushels of wheat in a given time period, but the addition of, say, a fourth farmer to the same amount of land will raise output by a much smaller amount, say 20 bushels.

The same principle applies to college education generally and to studying STEM majors in particular. Suppose we had less than one percent of the adult population with college degrees and only 100 computer scientists, with computer usage existing but at a dramatically lower level than today. A quintupling in the number of computer scientists, to 500, almost certainly would have a dramatically positive effect, as would a further quadrupling of the number to 2,000 and even a subsequent tripling of the number to 6,000. But if the numbers reached one million and increasing numbers of computer science graduates were ending up serving as baristas at Starbucks, the cry to expand computer science would cease with a vengeance.

Fortunately, markets provide us with a way of measuring the scarcity or surplus of individuals in any vocation. So in assessing the question, "should everyone go to college?" we need to look at the empirical evidence provided by labor markets.

THE CASE FOR "COLLEGE FOR ALL AND STEM TRAINING FOR MANY"

While "college for all" is a bit of an overstatement, many educators and foundations have been pushing to dramatically increase the proportion of Americans with college degrees. The Lumina Foundation, for example, has made that its primary mission, spending tens of millions annually promoting that cause. And there is some statistical evidence that seemingly supports that perspective.

The US Bureau of the Census publishes detailed data on earnings of individuals by level of educational attainment. Looking at the entire population, in 2016 the Census Bureau found that males with a bachelor's degree had median earnings of $63,269, compared with $33,516 with those with just a high school diploma. The college graduate earnings were 88.8 percent more than the high school diploma holder's, or nearly $30,000.

Moreover, that nearly $30,000 annual earnings advantage lasts over a lifetime of work, perhaps 40 years, accumulating to roughly a million dollar payoff to a college degree (after allowing for discounting future earnings back to present value). Since by any measure the cost of going to college is well below a million dollars, one might conclude "having a college degree produces a very good return on the investment."

The same holds for women. Female college grads with bachelor degrees had median earnings in 2016 of $41,045, compared with only $19,904 for high school graduates; the college degree holders earned a walloping 106.2 percent more than those with only a high school education.

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The precise results vary somewhat depending on the measure of income used (median earnings vs. average earnings) and the work status of the individual (looking at the whole population including non-workers, the working population including part-time workers, or only those working full-time all year long). However measured, college graduates earn a great deal more than those with less education.

Work earnings are an excellent measure of productivity, and represent roughly society's assessment of the value added by the worker to national output. Since college graduates earn up to double that of high school grads, it would seem to reason that increasing the proportion of college graduates would raise national productivity and expand our output of goods and services, and, thus, the standard of living. This is particularly true if the

increase in output is greater than the resources needed to provide more college education.

This is reinforced for the STEM majors by income data by occupation. Routinely, the top paying five or so occupations by college majors are in the STEM disciplines in reported data from either the federal government or private data providers such as Payscale.com. We return to this shortly.

A CONTRARIAN PERSPECTIVE: THE NUMBERS DON'T TELL THE WHOLE STORY

There are, however, fundamental problems with the analysis above. The implicit assumption is that, except for education, high school and college graduates are about equal in other attributes that might explain earnings differentials—it is the educational training that explains the higher earnings of college graduates. In reality, college grads almost certainly have greater cognitive skills, more work discipline, and better prior (high school) academic qualifications than those with just high school diplomas. Even if those college grads had *not* gone to college, they probably would have earned more than the existing high school diploma holders because they would be perceived by employers to be smarter and more dependable workers.

In other words, not all the earnings associated with more schooling have much to do with schooling itself. In a new book *The Case Against Education*, George Mason University economist Bryan Caplan estimates that perhaps 80 percent of the college earnings differential has nothing to do with college learning itself, and that the true social rate of return on a college degree typically is quite low. Some people studying French or philosophy in college do so because they enjoy those subjects; they are consuming a service, but not truly "investing" in something that enhances their productivity in the labor market.

There is an even more fundamental problem: some 40 percent or more of those entering college on a full-time basis do not graduate within six years. Among Pell Grants recipients, generally coming from lower income households, a *majority* fail to graduate in a timely fashion. In other words, there is a considerable risk that entering students will spend large sums of money and end up without a diploma, probably earning a negative return on their personal financial investment in college, an investment that includes the earnings foregone while studying for a degree. And the empirical evidence suggests the risk of not completing college is greater for lower income students.

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This gets to a fundamental dilemma. Americans generally accept the proposition that a low-cost college education subsidized by government is desirable in order to allow some less affluent citizens move up the economic ladder and achieve the American Dream. But the reality is that most of those not getting degrees today have weak academic backgrounds and are likely to flounder in college—unless we lower academic standards to the point where a "college degree" denotes little more knowledge than what a high school diploma did a couple of generations back.

Dropping out of college reflects more than low incomes, of course. There are a host of factors that are relevant, including family structure and support, the quality of secondary schooling, personal or family problems, individual work ethic, and even inculcated values such as religious beliefs.

From this flows another question: is it really advantageous to the economic aspirations of low income Americans with mediocre secondary education backgrounds to push them into four-year degree programs when, for a large proportion of them, the result will be dropping out of college, a sizable student loan debt, and the psychological scars arising from being considered something of an academic failure?

But let's return to the numbers. Data from the Federal Reserve Bank of New York confirm that a very significant proportion of recent college graduates are "underemployed," taking jobs where a majority of job holders have a lesser education, usually a high school diploma. More college graduates are taking such jobs as baristas, retail store cashiers, home health care aides, Uber drivers, and bartenders. The underemployment rate for recent college graduates in March 2018 was 42.5 percent, at a time when overall unemployment is well below average. The estimate rate for all college graduates (including those working for many years) is a lower 34.1 percent. Nonetheless, one out of every three college graduates is in a job where historically a college degree is not necessary. As a consequence of all of this, college graduates are crowding out perfectly qualified high school graduates from jobs. A restaurant gets five applicants for a bartender's job, four with high school diplomas and one with a college degree. Other things equal, the college grad will have the edge to get the job: she or he persevered in getting an education, probably suggesting higher levels of work discipline, dependability, and perhaps intelligence. Credential inflation is therefore rampant in America.

Recently, the Fed has traced the number of college graduates having good non-college jobs: positions where the pay is pretty good but the job nonetheless historically has not required a

college degree. It turns out, a large portion of underemployed college graduates get pretty good paying positions in occupations not requiring lots of formal education. Nonetheless, the most recent data shows that 13.4 percent of recent college graduates are in what the Fed calls low-paying jobs, and another 3.8 percent are unemployed—17.2 percent have unsatisfactory labor market outcomes. The financial risks associated with getting a college degree are then far from trivial.

NOT ALL STEM DISCIPLINES ARE CREATED EQUAL EITHER

Readers might say that these generalizations do not apply to those entering the STEM disciplines, and certainly our political and business leaders have urged greater emphasis on them. And, most often, those majoring in stem disciplines do well, with lower underemployment rates and much higher rates of compensation. The US Bureau of the Census tracks college graduates by their field of major study.

Computer engineering is actually rather typical of engineering-related disciplines. The most recent Census data (as reported on the New York Federal Reserve Bank website) shows a low 2.8 percent unemployment rate amongst computer engineering majors, with an underemployment rate of 20.3 percent, less than one-half the overall average. Early career median earnings of $67,000 are dramatically higher than for the overall college educated population ($40,000). Moreover, that earnings advantage continues to be maintained as careers advance: the median mid-career earnings of $105,000 for computer engineers is over 60 percent higher than for the entire college educated population ($65,000) and nearly double that for, say, ethnic studies majors ($57,000). For "computer science" majors, the numbers are somewhat but not dramatically lower than for computer engineering (early career median earnings of $60,000).

At the same time, there is a tendency to overgeneralize. Within the STEM fields there are surprisingly large variations, with the engineers at the top and the biological sciences at the bottom. The underemployment rate for those majoring in "animal and plant science" is a staggering 55.7 percent, with 4.8 percent being completely unemployed. Median early career earnings of $35,000 are lower than, for example, history majors ($36,000), a differential that actually expands as careers progress. Chemistry majors do better than animal and plant science majors, but the differences between majoring in chemistry and, say, art history, are not overwhelmingly large—mid-career median earnings in chemistry ($70,000) are less than 13 percent higher than in art history. Economics majors generally outshine most STEM discipline majors outside engineering, often substantially so.

The "College for All" movement promoted vigorously by guidance counselors, political, business, and educational leaders needs to be rethought. There are many Americans for whom college is the appropriate educational choice—indeed, often more than merely a bachelor's degree is optimal. But there are others—millions—for whom going to college entails very substantial risks and potentially financially and psychological hardships.

For many, the optimal education may well be to have a modest amount of vocationally oriented post-secondary educational training, perhaps by attending community college or, often even better, a "career college" that offers non-degree certificated courses in a specific skill, such as welding, or learning to drive a 18-wheel truck. In pushing "college for all," we have overinvested in some traditional forms of education, and perhaps underinvested in others. Above all, not all Americans are the same—what works for some individuals does not work for others. Recognition of that reality can lead to better educational and vocational outcomes for Americans.

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