



Why Are Recent College Graduates Underemployed?

University Enrollments and Labor-Market Realities

By Richard Vedder, Christopher Denhart,
and Jonathan Robe

Center for College Affordability and Productivity



A policy paper from the
Center for College Affordability and Productivity

January 2013





Why Are Recent College Graduates Underemployed?

About the Authors

Richard Vedder directs the Center for College Affordability and Productivity (CCAP), is Distinguished Professor of Economics Emeritus at Ohio University, and is an Adjunct Scholar at the American Enterprise Institute. **Christopher Denhart** is an undergraduate at Ohio University studying economics. **Jonathan Robe** is a research fellow at CCAP and a graduate of Ohio University.

Acknowledgements

The authors express thanks to their colleagues Anthony Hennen, Harrison Cummins, Daniel Garrett, Joseph Hartge, and former colleague Nicholas Wetzel for direct or indirect assistance, and to the Searle Freedom Trust for major financial support.

Center for College Affordability and Productivity

The Center for College Affordability and Productivity (CCAP) is a non-partisan, nonprofit research center based in Washington, DC that is dedicated to researching public policy and economic issues relating to postsecondary education. CCAP aims to facilitate a broader dialogue that challenges conventional thinking about costs, efficiency, and innovation in postsecondary education in the United States.

1055 Thomas Jefferson Street #L26
Washington, DC 20007

Tel: (202) 621-0536 www.centerforcollegeaffordability.org
theccap@centerforcollegeaffordability.org



Table of Contents

Executive Summary	1
Introduction	3
Three Different Perspectives or Motivations for Attending College	6
Higher Education and Human Capital Formation	6
Higher Education as a Signaling/Screening Device	7
Higher Education as a Consumption Good/Socialization Device	9
Educational Attainment and the World of Work: Some Evidence	11
BLS Statistics on Jobs and Educational Attainment	11
Empirical Findings	12
Underemployment Will Likely Continue During the Next Decade	19
Is The College Graduate Underemployment Problem A Recent Development?	23
Not All College Degrees Are Created Equal	25
Two Possible Scenarios: Falling College Enrollments or Master's in Janitorial	
Studies Degrees?	28
Conclusions: Underemployed and Overinvested	30
Notes	33

Tables and Figures

Figure 1: Education Requirements of Occupations Held by College Graduates	12
Figure 2: Jobs Requiring a College Degree vs. Number of College Graduates	13
Figure 3: Persons 25 Years or Older with College Degrees, 1950–2010	13
Figure 4: Employment for the Largest Occupations in the United States, May 2011	14
Figure 5: Major Occupational Groups as a Percent of US total Employment, May 2011	15
Table 1: Jobs Requiring Less than a High-School Diploma but Employing More	
than 50,000 College Graduates, 2010	16
Table 2: Fourteen Jobs requiring a High-School Diploma but Employing More than	
200,000 College Graduates, 2010	17
Table 3: Thirty Occupations Projected to Have the Largest Growth, 2010–2020	18
Figure 6: Actual and Projected Number of Jobs by Educational Requirements, 2010-2020 ..	19
Figure 7: Americans with a Bachelor's Degree or More, 2010 and 2020	20
Figure 8: Projections in College Graduate Growth vs. Jobs Requiring a	
College Degree Growth, 2010 to 2020	21
Figure 9: Growth in the Number of College Graduates vs. Jobs Requiring a	
College Degree, 2010 to 2020	22
Figure 10: Percentage of Employees in Select Occupations with a Bachelor's Degree	
or More, 1970 and 2010	24
Table 4: Starting and Mid-Career Salaries, 32 College Majors	26
Figure 11: Average Mid-Career Salaries: Three Types of Schools	27
Figure 12: Projected Number of Americans Over 65, 2010–2030	29

Executive Summary

Increasing numbers of recent college graduates are ending up in relatively low-skilled jobs that, historically, have gone to those with lower levels of educational attainment. This study examines this phenomenon in some detail, concluding:

- About 48 percent of employed U.S. college graduates are in jobs that the Bureau of Labor Statistics (BLS) suggests requires less than a four-year college education. Eleven percent of employed college graduates are in occupations requiring more than a high-school diploma but less than a bachelor's, and 37 percent are in occupations requiring no more than a high-school diploma;
- The proportion of overeducated workers in occupations appears to have grown substantially; in 1970, fewer than one percent of taxi drivers and two percent of firefighters had college degrees, while now more than 15 percent do in both jobs;
- About five million college graduates are in jobs the BLS says require less than a high-school education;
- Comparing average college and high-school earnings is highly misleading as a guide for vocational success, given high college-dropout rates and the fact that overproduction of college graduates lowers recent graduate earnings relative to those graduating earlier;
- Not all colleges are equal: Typical graduates of elite private schools make more than graduates of flagship state universities, but those graduates do much better than those attending relatively non-selective institutions;
- Not all majors are equal: Engineering and economics graduates, for example, typically earn almost double what social work and education graduates receive by mid-career;
- Past and projected future growth in college enrollments and the number of graduates exceeds the actual or projected growth in high-skilled jobs, explaining the development of the underemployment problem and its probable worsening in future years;
- Rising college costs and perceived declines in economic benefits may well lead to declining enrollments and market share for traditional schools and the development of new methods of certifying occupation competence.

Introduction

Political leaders, prominent foundations, and college presidents have argued that the nation must increase the proportion of adults with college degrees in order for America to remain competitive in the global economy. President Barack Obama, for example, in his first Address to a Joint Session of Congress, declared that, “by 2020, America will once again have the highest proportion of college graduates in the world.”¹ Subsequently, that goal was more precisely stated as the goal of achieving, by 2020, a 60 percent college attainment rate for workers, aged 25 to 34.² The Lumina and Gates Foundations have also, with some prominence, announced similar goals that the respective organization is pursuing.³ Arthur Hauptman traces the recent history of policy goals for specific educational attainment rates to the work done by Jobs for the Future a decade ago, which issued a call to “identify policies and practices that lead to doubling the number of low-income students gaining quality postsecondary degrees and credentials.”⁴ Eminent national figures like Federal Reserve Board Chairman Ben Bernanke have argued that high college attainment is necessary both for global economic leadership and the preservation of the American egalitarian ideal that allows for high levels of intergenerational income mobility—poor persons becoming rich.⁵

Supporting those positions, economists, especially those at Georgetown University (and financed in part by the Lumina and Gates Foundations), have issued studies demonstrating that there is a significant earnings premium associated with the possession of a college degree. That is, college graduates tend to earn more in the labor market compared with those with only a high-school education, a differential that is large enough to justify the expenditure of increasingly large sums of money necessary to finance a college degree.⁶ Those studies are an extension of studies published regularly by the College Board or data published by the U.S. Bureau of Labor Statistics.⁷ Not only is more higher education in the national interest, we are told, but it is usually in the private self-interest of student recipients of that education. Moreover, we are told by the Pew Mobility Project that having a degree has reduced somewhat the vulnerability of college graduates to becoming underemployed or not getting a job during the recent downturn and sluggish recovery.⁸ All of those claims do, to varying degrees, have some merit and validity, but the argument in this report is that those claims fail to tell the full story.

A less optimistic story points out that, while there are undoubtedly many who benefit—even quite substantially economically, from higher education, a not inconsequential number of Americans who obtain higher education do not achieve the economic gains traditionally accompanying the acquisition of college-level credentials. Andrew Sum and associates at Northeastern University and elsewhere have suggested a meaningful number of college graduates do not take jobs appropriate to their skills.⁹ An Associated Press report in mid-2012 suggests that a large portion—probably a small majority—of recent college graduates are, in fact, underemployed—either not working, employed only part-time and/or working in positions that historically have been predominantly occupied by those with relatively low levels of educational attainment.¹⁰ The senior author of this report has made similar arguments in a number of public writings stretching back several years.¹¹ In late 2010, the present authors (along with colleagues) found that, using data from the U.S. Department of Labor, one measure of underemployment of college graduates was as



Why Are Recent College Graduates Underemployed?

high as 38 percent in 2008.¹² Still others have joined in the fray reinforcing that perspective.¹³ Those different perspectives have attracted national attention, with one major television network even airing nationally a debate of the efficacy of encouraging more and more students to attend college.¹⁴ All of those writings, to varying degrees, call into question “the belief in a simple, direct relationship between the amount of education in a society and its future growth rate,” particularly with respect to employment prospects for the young which are commensurate with their educational achievements.¹⁵

This study uses empirical evidence relating to labor markets to argue that a growing disconnect has evolved between employer needs and the volume and nature of college training of students, and that the growth of supply of college-educated labor is exceeding the growth in the demand for such labor in the labor market. We suggest that this problem is more pronounced today than in the past, though it is assuredly true that during the past several decades, a small number of writers and researchers have noted it.¹⁶ It puts meat on the bones of those, including ourselves, who argue that we might well be over-credentialing the population through formal education programs. Indeed, it can be argued that we may well be “over-invested” in higher education.¹⁷

In this study we show that there are many jobs that have not changed in nature much over time but for which the educational attainment of job holders has indeed increased meaningfully. In other words, we are using more resources to prepare these individuals for employment than was the case a generation or more ago. We show that in some categories of occupations historically almost completely shunned by college graduates, recent college graduates are effectively crowding out those with lesser education for jobs.¹⁸

How can average college-graduate earnings be relatively so high and yet persons like George Leef, Jackson Toby, and ourselves show skepticism about the move to increase college enrollments? Looking at the financial dimensions, there are two factors at work. First, there are enormous risks to attending college not picked up in earnings data. For example, 45 percent or so of those entering college fail to graduate within six years. Related to that, not everyone earns the average—maybe one-third of those who graduate make at least 20 percent less than the average, so the high school-college earnings differential for them is quite different than the average differentials reported by Anthony Carnevale and associates at Georgetown University, a point Carnevale himself has acknowledged. To be sure, those who fail to graduate from college often derive some earnings benefits from partial college attendance, but the wage differential data are clear that a large proportion of the earnings gains associated with attending college come only upon completion of the college degree.¹⁹

Elaborating, in 2011 full-time year-round male workers with high-school diplomas averaged \$46,038 in earnings, compared with \$80,508 for holders of bachelor’s degrees.²⁰ The average college graduate made \$34,470 a year more. Looking at college dropouts—those who started but did not finish a bachelor’s degree—the earnings averaged only \$7,590 more than for high-school graduates. The huge payoff from college comes at the end in order for one to derive large financial benefits from university attendance. We examine the reasons for that shortly.

Even more crucially, the claim that “college is worth it” because there are high economic returns associated with possession of a college degree often ignores the role other factors play in determining employment and wages. A failure to account for other factors would cause one to misattribute to education the effect on labor market outcomes that in actuality is caused by other factors. For instance, Frederic Pryor and David Schaffer, in their book, *Who’s Not Working and Why*, observed that the solution to the apparent paradox of rising underemployment of college graduates coupled with an increasing educational payoff through the mid-1990s is that “economic returns to cognitive skills, *independent of education*, have



increased. That is the most important manifestation of what many call ‘skill-biased technical change.’²¹ Omitting from the analysis a measure of what Pryor and Schaffer call “functional literacy” causes one to overstate the returns to education because of the positive correlation that exists between education and the cognitive skills associated with functional literacy.²² Furthermore, it is not just the failure to control for cognitive skills that confounds the perceived effect of education on labor market outcomes; as we discuss in the section on college degrees as signaling devices, there are many factors which are positively correlated with education that conceivably are the reason (rather than education, *per se*) that college graduates, on average, have better employment rates and earnings than their less educated peers.

Second, there is a difference between looking at the entire college graduate working population, many of whom graduated 30 or more years ago, and looking at the new graduates. In economics, it is at the *margin* where most important decisions are made, and the margin is where you find the new, incremental college graduates. It may be the graduates of 1990 have good paying jobs but the graduates of 2012 do not, and might not ever get them. Indeed, as Neeta Fogg and Paul Harrington have found, not only are younger college graduates more likely than their older counterparts to be employed in non-college level jobs but also the “sharpest increase in the mal-employment rate between 2000 and 2010 occurred among the youngest college graduates.”²³ Much of this present study is about the margin, and about the historical evolution that has led the newest generation of college students and graduates to be at greater economic risk than preceding ones.



Three Different Perspectives or Motivations for Attending College

In assessing whether too many or too few persons go to college, we need to step back and ask: What is the purpose of a college education? For the purposes of this report, we will largely ignore the research function, not because it is unimportant but because it is usually not directly relevant to the issue of educating young persons.²⁴ Looking at the instructional function of universities, we find three economic arguments for attending college. We will call them the human capital argument, the screening/signaling argument, and the consumption argument.

Higher Education and Human Capital Formation

Educators often argue that the reason college graduates earn so much more on average than those with lesser education is that colleges impart skills that enhance labor productivity. Higher education is about forming human capital—making students more productive workers.²⁵ No one seriously denies that some skills are clearly learned through higher education. Engineers acquire knowledge from their collegiate studies that makes them far better at solving practical problems than if they never received that training. That idea holds for a host of other occupational areas as well, for example, accounting, architecture, and nursing. Moreover, to the extent colleges develop critical-thinking skills, the generalized knowledge imparted in college might make it easier for people to gain human capital faster in their future careers; that is, even though the skills a student gains in college may not be directly applicable to a given job, the college graduate nevertheless gains an improved capacity to learn the specific skill set one needs for the particular job in which one is employed. A good thinker can grasp solutions to problems never confronted before, and these solutions become part of our human capital stock.

Yet there is a tendency, sometimes, to give higher education credit where it is not due. The students attending college are on average brighter, more disciplined, and probably more creative than high-school graduates who do not go on to school. A good bit of the productivity/earnings advantage of college graduates is probably related to human personality traits not directly tied to college education.

Once, with the help of a colleague, the senior author tried to estimate the human capital stock of the U.S., and determine what portion was related to pre-college training (human capital of those not going to college plus that part of the human capital of college-trained workers not related at all to their college education), what portion is truly high-education created, and what portion is related to on-the-job training and other post-schooling forms of human capital formation. The estimation is tricky and subject to many assumptions, but we found that the college-related component of our human capital stock is a distinct minority of the total, and that learning by doing is particularly underrated in the contribution it makes to raising the productivity of American workers. That fact mainly explains why experienced 50-year-old workers make vastly more on average than workers half that age with precisely the same level of educational attainment.²⁶



Higher Education as a Signaling/Screening Device

Private employers try to maximize profits by reducing expenditures. A very costly expense relates to hiring good staff—the national-income accounts data published regularly by the Bureau of Economic Analysis tell us that over 60 percent of income payments associated with creating goods and services relates to personnel costs.²⁷ How does one know which potential workers will be good? It takes time and resources to explore the talents of those applying for jobs. Moreover, public policy actions taken in this country several decades ago severely limit the ability of employers to learn much about their potential employees. In particular, the *Griggs v. Duke Power* decision by the U.S. Supreme Court and subsequent related court cases or legislative action have made employers extremely cautious about using testing as a means of measuring potential competence.²⁸ Bryan O’Keefe and the senior author have argued this court decision and related legislation was a factor in the rising college/high-school earnings differential after the mid-1970s.²⁹

College diplomas convey information, since, on average, the typical college graduate is moderately intelligent (usually with an IQ above the 100 average of the general population) and is persistent (being part of the 55 percent of students entering college who graduate within six years rather than the 45 percent who drop out).³⁰ Independent of any learning, the college graduate has desirable attributes from the perspective of the employer.³¹ Those wanting sharp, relatively reliable employees can require a bachelor’s degree as a qualification for employment and dramatically increase the chances that the individual will be a good employee. Therefore, many employers are willing to pay a significant wage premium to acquire the services of college graduates. As Catherine Rampell put it recently, “it seems as if more employers are using bachelor’s degrees as a signal of drive or talent, regardless of the relevance of the skills actually learned in college.”³² Talking to Burning Glass, a company that looks at job advertisements, Rampell noted large increases in the number of ads over the last five years requiring a B.A. degree for a given task; for example, only 12 percent of 2007 ads for dental laboratory technicians required a degree, compared with 33 percent of 2012 ads, suggesting the possibility of even rapid credential inflation in recent years.

According to that argument, then, college is really more of a screening device that helps separate the sharp, disciplined applicants from the dullards and slackers.³³ If the college from which students graduates has a selective admissions policy, the employer is doubly reassured that the college graduate is sharp, and thus is willing to pay an even larger wage premium. Harvard graduates, on average, make a good deal more than graduates of, say, the University of Nebraska at Omaha. The college degree is a signal to employers, and one that they aggressively utilize.

From the employer’s perspective, the best thing about relying on diplomas to help narrow the pool of job applicants is that the potential employee bears the bulk of the search-related costs—he or she pays for the college training. The employer in effect pays them back for those costs through a salary differential that ultimately might cover the training/screening costs, but in the short run the employer does not lay out huge sums of money to learn of the potential employee’s competence. In addition, employers may also value the fact that their employees are certified by third-parties who specialize in the general education of young students, an expertise that many employers lack.

To us, that screening device function is the main factor in allowing colleges to raise their prices (tuition fees) dramatically over time. With the passage of time and the deterioration in the quality of the skill levels of high-school graduates, employers have bid up the college/high-school earnings differential, allowing the schools to raise prices more and still leave college a good personal investment for those who successfully complete higher education programs. That is a theme that will be developed in greater detail in a forthcoming book by Bryan Caplan, an economist at George Mason University.³⁴



Why Are Recent College Graduates Underemployed?

The rise in the importance of a college education as a signaling device is a beautiful example of Say's Law that says, very crudely, "Supply creates its own demand."³⁵ Suppose in 1970, a bar owner advertised for a bartender and received 15 applicants, most or all of whom had high school diplomas. He would most likely choose the bartender on criteria unrelated to educational credentials. Suppose today, another bar owner likewise advertises for a bartender, and also gets 15 applicants, but four have bachelor's degrees. The owner, to minimize time and resources devoted to interviewing a long line of applicants, might restrict interviews to the four holders of degrees, since it is likely a priori that these persons will on average be a little smarter, a little more reliable, etc., than the other applicants. Education, heretofore not much of a screening device, has become one in terms of hiring the most qualified person for jobs for which skill requirements are relatively modest and learned on the job quickly. The existence of an ample supply of college graduate bartenders has created a demand for them, sometimes explicitly stated in minimal education qualifications required for the job.

Say's Law comes in because the supply of college graduates has soared. In 1970, a little over one-tenth of the population over 25 had college degrees; that proportion has nearly tripled to over 30 percent today.³⁶ As we will demonstrate below, the proportion of college graduates has grown faster than the demand for high-skilled jobs. Employers previously would not dream of explicitly or implicitly requiring a college degree for a bartender's job, but they now have the luxury of imposing that requirement. The vast increase in the supply of college graduates has created a demand for them that has nothing to do with the technical proficiencies for the job acquired in college.

The empirical analysis below suggests that for many who enter college, the ultimate payoff in terms of employment is disappointing in a financial sense. As the cost of the piece of paper—the college diploma—grows over time, and the financial gains to having it stagnate or even decline (as more graduates take lower-paying unskilled jobs), the private rate of return on a college education falls for many, and people start looking for alternative ways to certify worker competence. One approach, of course, is to offer a very low cost online education centered around high-quality open-source courses. Someone, of course, needs to certify that the packaging of these courses together constitutes the equivalent of a bachelor's degree, a job normally performed by traditional colleges and universities. An alternative approach is to develop more of an examination option, not dissimilar to the GED diploma equivalency for high-school graduation. Thus, there are substitutes, albeit ones seldom used today, to the traditional residentially based degree at a four-year college.

Proponents of "college for all" fail to mention, in general, that *the signaling value of a bachelor's degree declines as a larger proportion of the population achieves it*. When the senior author graduated from college 50 years ago in 1962, a single-digit proportion of the adult population had bachelor's degrees or more. People with such degrees were among a relatively small, even elite, proportion of the population believed to have, for example, very high levels of erudition, intelligence, and discipline. Even graduates of mid- to low- quality institutions were viewed as somewhat special. If in, say, 2025 close to half of adults have such degrees, by mathematical necessity, some graduates are at best just about average, not endowed with relatively high levels of the productive attributes desired by employers.

That plausibly explains the "arms race" with regards to college admissions. Students are clamoring to attend the 25 or 50 top universities and liberal arts colleges in America. Applications are soaring for those schools, while applications for lesser colleges are stagnating as the number of 18-to-22 year-old Americans (particularly those expected to attend college) plateaus.³⁷ In response, new signaling devices are arising to broadcast true excellence: attendance at a high quality institution, such as Ivy League schools,



Stanford, M.I.T., Duke, Northwestern, Chicago, Amherst, Williams, Swarthmore, etc., or getting even higher degrees, such as a master's or even a doctorate.

But all of this is extremely expensive, and the irresolvable conflict between employer aspirations for the productive elite and the egalitarian impulses to educate the masses can have unintended consequences, such as the denigration of the value of a bachelor's degree, a lowering of collegiate academic quality, a growing reputational inequality among colleges, etc. We do not think it is coincidental that the rise in the proportion of adults with degrees has been accompanied by a growing reputational gap between the top private schools and state universities. In 1988, eight of the top 25 research universities in the US News & World Report rankings were public institutions; today, only three are.³⁸ With the Forbes rankings, the results are similar: of the top 50 schools (including both universities and liberal arts colleges), only eight are public institutions, and of these, three are national military academies (Army, Navy, and Air Force).³⁹

Higher Education as a Consumption Good/Socialization Device

For a large portion of the college-going population, attendance is only partly motivated by human capital investment criteria, namely a desire to ultimately obtain a good job and a ticket to a relatively affluent middle class (or better) life. Those students go to college also to have fun—to meet new friends, to use top-of-the-line exercise machines to relax, to party, to get drunk, and have sex. The “country-clubbization” of higher education, to use a term the senior author coined several years ago, is important to many, particularly for the relatively affluent families who can afford to let their kids indulge in such activities.⁴⁰ Some schools explicitly cater to students for whom this social/consumption dimension is very important.⁴¹

To be sure, the lines between the socialization and the financial investment motives for attending college often become blurred. “Networking” involves social interaction between students, their parents, alumni, etc., and much of that goes on in colleges. That networking is an informal, though often highly effective, way that employers learn about employees. In some respects, networking goes against the American egalitarian grain, as people with connections have an advantage in getting good jobs over equally- or better-qualified individuals lacking those connections. But that is a reality of life, always has been, and maybe always will be. At elite schools like Princeton, students vie to get into prestigious social clubs with rich traditions but where the resultant intergenerational connections often become good vocational investments for the undergraduates. At less elite schools, fraternities, sororities, or various club or sport activities serve a similar role.

Some of the socialization dimensions of college do have a broader “educational” purpose. During college, adolescent children become young adults, and much of that transition involves students learning through the choices that they make—about their friends, their management of time and financial resources, and their work and play habits. The residential college experience deepens and quickens that child-to-adult transition compared with those commuting to school or studying online. Some clearly non-vocationally related learning, such as studying Shakespeare or Plato, might impart both intellectual satisfaction (“consumption”) and some relatively stealth skill qualities that add to maturity, judgment, and discipline in later life that might even have positive financial implications. All of this is why it is exceedingly unlikely that the better residential colleges and universities will die anytime in the next generation or so, despite advances in the technology of learning. Even if most of the existing higher education system were thoroughly transformed by revolutionary educational technology, there will always be a segment of the population willing and able to pay for the elite diploma offered by Harvard University or Williams College.



Why Are Recent College Graduates Underemployed?

From a public policy perspective, however, the socialization dimension of college raises questions: Why should taxpayers in general, many of whom are relatively poor, subsidize the partying and “fun” of kids from mostly moderately affluent families? The educational benefits of socialization, while not zero, are truly secondary to having fun. We do not subsidize families joining country clubs, so why should we subsidize kids attending country club-like institutions that sometimes almost seem like they are masquerading as institutions of higher learning?





Educational Attainment and the World of Work: Some Evidence

With the help of our colleague Harrison Cummins at the Center for College Affordability and Productivity, we gathered evidence on how, over time, credential inflation has led to growing proportions of workers in some distinctly lower-skilled occupations having significant exposure to higher education, including the possession of baccalaureate degrees. We will start with relatively recent evidence using broad categories of job skills, and later broaden the discussion to include historical trends. As we proceed, we will narrow our scope, looking at some very specific occupations and the occupational attainment and financial success of job occupants.

BLS Statistics on Jobs and Educational Attainment

The Bureau of Labor Statistics (BLS) in the U.S. Department of Labor currently catalogs all occupations using a tripartite classification system on the basis of “typical entry-level education, related work experience, and typical on-the-job training.” For the purposes of this report, we are interested solely in the educational classification component, which are assigned by the BLS on the basis of either legally mandated education requirements for particular occupations (e.g., lawyers and physicians) or by an analysis revealing “the typical path to entry for an occupation.” This approach, however, precludes the BLS from accounting for the possibility of multiple entries to particular occupations as it considers only the path deemed to be typical by the occupational-level analysis (the BLS does make a note of different occupational paths in its *Occupational Outlook Handbook*). Furthermore, some error in the educational data, derived from faulty interpretations of the survey questions or inaccurate response coding may exist. Nevertheless, despite these imperfections, the tripartite classification system is an improvement to the past methodology employed by the BLS which classified all occupations on the basis of a single category reflecting the “most significant source” of education or training for each occupation.⁴²

It is critical, particularly in the context of our analysis of labor misallocations and underemployment of college graduates, to explain accurately (albeit succinctly) the categorization methodology that the BLS uses. In fact, in the past a number of analysts have incorrectly described the approach taken by the BLS.⁴³ A proper understanding of the methodology the BLS uses is a prerequisite to making any interpretation of the data related to the underemployment of college graduates. After all, as the BLS itself notes, one of the reasons that actual employment in various occupations does not perfectly match the typical educational requirements is precisely the phenomenon of highly educated persons finding employment in occupations requiring less education. Despite the fact that the BLS data are not perfect (have any data been so?), in our view they are the superior to the approach taken by Carnevale and his colleagues. As Andrew Sum and Paul Harrington pointed out more than two years ago, the fatal flaw underpinning the analysis used by Carnevale, *et al*, is that they “assume a world where no under-employment... of college graduates exists. Indeed, they expressly acknowledge this choice and reject the idea that college graduates could become underutilized or malemployed.”⁴⁴ Paul Barton reinforces that avoidance of this error is



Why Are Recent College Graduates Underemployed?

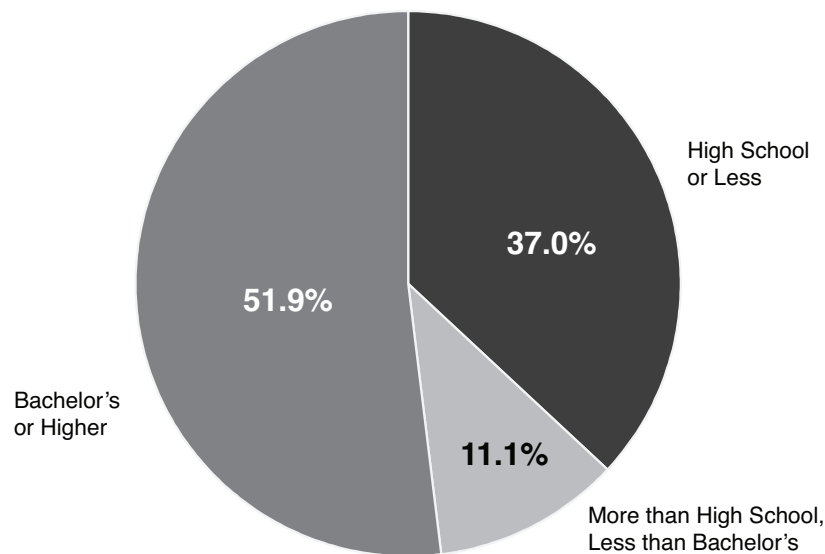
crucial because we will necessarily exaggerate the labor market's demand for college graduates if we conflate "the percentage of the workforce that has gone to college... [with] the percentage of jobs that require college-level learning—or when the assumption is made that the knowledge gained in college is required to perform that job."⁴⁵ Because the possibility of underemployment of college graduates is intuitively obvious, we are more confident of using the BLS data (which allow for the possibility of underemployment) rather than data based on the supposition that underemployment by definition cannot exist.

Empirical Findings

We can now look at working American college graduates, and see how their training matches the educational level that the BLS thinks is appropriate. Figure 1 presents 2010 data for 41.7 million working college graduates and illustrates that *barely half of college graduates are in occupations requiring bachelor's degrees or more*. Some 37 percent, in fact, are in jobs requiring a high-school diploma or less, and about 11 percent in jobs typically requiring some postsecondary training, usually an associate's degree. That estimate for college graduate underemployment is somewhat different from the estimates others have derived, in part due to differences in the data we use as well as how precisely one defines "underemployment" or "mal-employment."⁴⁶

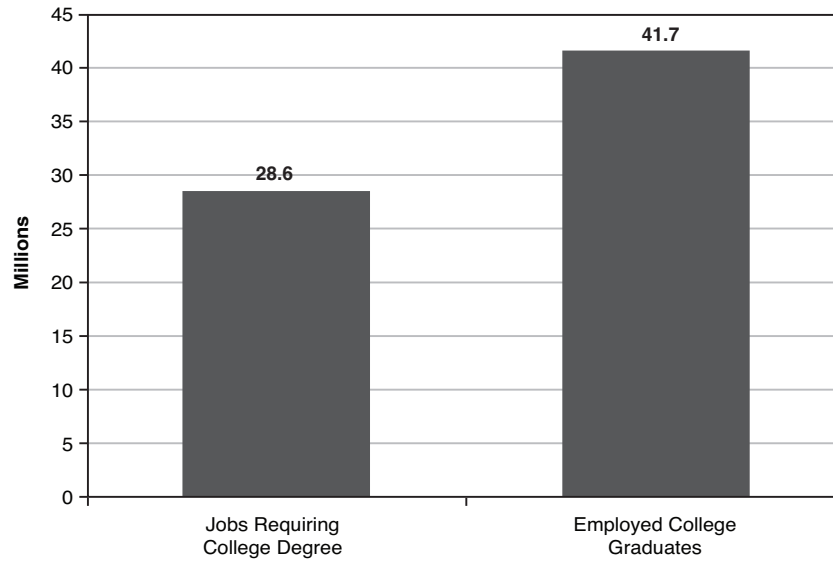
The basic problem is that *the stock of college graduates is far greater than the number of jobs requiring a bachelor's degree or more* (see Figure 2).⁴⁷ There are over 13 million more working college graduates than jobs requiring a bachelor's degree or more (several million jobs requiring bachelor's degrees are in fact filled with those with lesser education, so the actual number of college graduates in jobs requiring less than a college degree is over 20 million), according to these data.

FIGURE 1
EDUCATION REQUIREMENTS OF OCCUPATIONS HELD BY COLLEGE GRADUATES



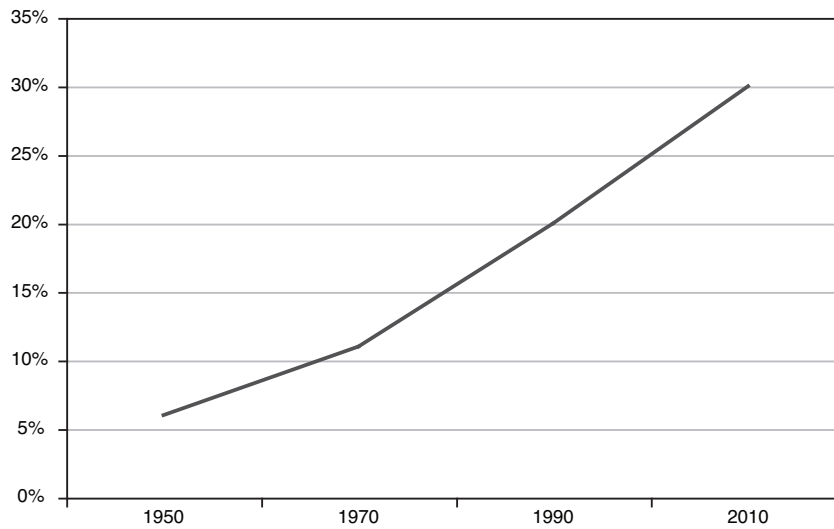
Source: U.S. Bureau of Labor Statistics, authors' calculations

FIGURE 2
JOBS REQUIRING A COLLEGE DEGREE VS. NUMBER OF COLLEGE GRADUATES



Source: U.S. Bureau of Labor Statistics

FIGURE 3
PERSONS 25 YEARS OR OLDER WITH COLLEGE DEGREES, 1950–2010



Source: U.S. Bureau of the Census



Why Are Recent College Graduates Underemployed?

FIGURE 4
EMPLOYMENT FOR THE LARGEST OCCUPATIONS IN THE UNITED STATES, MAY 2011



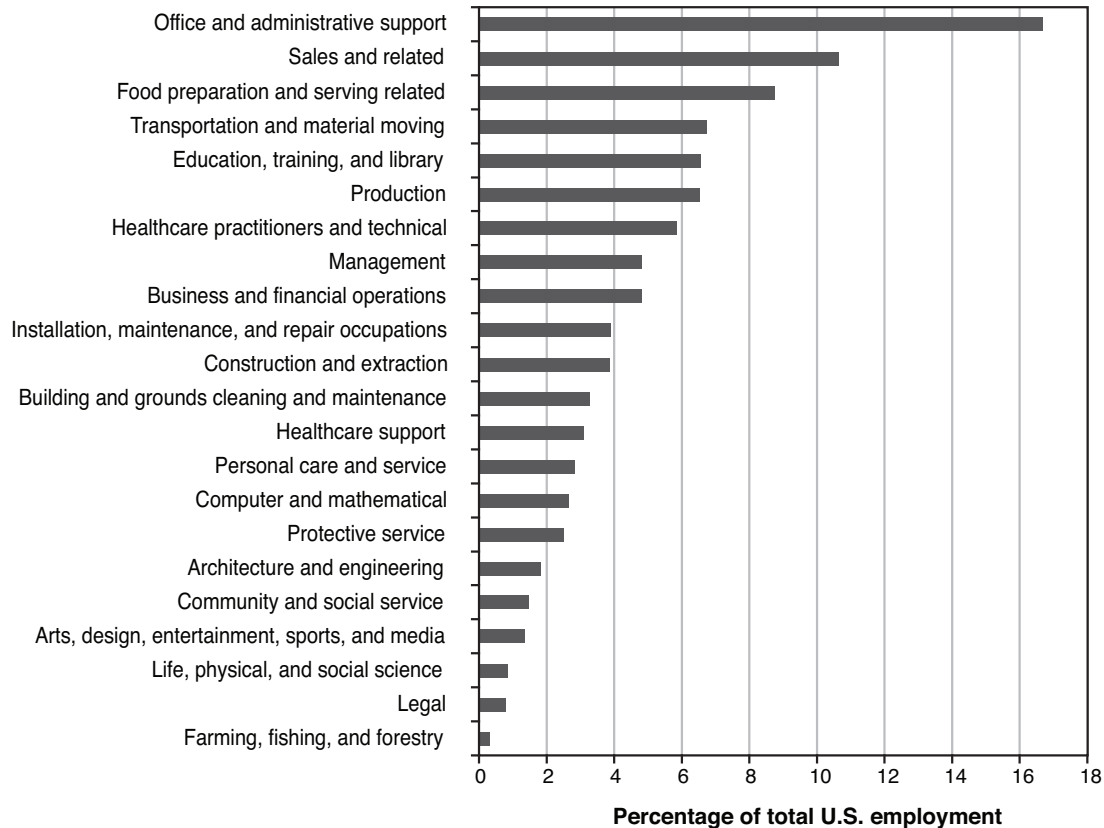
Source: U.S. Bureau of Labor Statistics

The proportion of the adult population with degrees has dramatically increased with the passage of time. Figure 3 shows that the proportion of adults with degrees in 2010, 30 percent, was five times what it was 60 years earlier. In 1950 or 1960, college graduates constituted a single digit proportion of the adult population—almost by definition, an elite group. As we will soon demonstrate, what has happened over time is that the proportion of the workforce with college degrees has grown far faster than the proportion needing those degrees in order to fulfill the needs of their jobs, forcing a growing number of college graduates to take jobs which historically have been filled by those with lower levels of educational attainment.

The reality is that many jobs in the United States do not require a lot of education to perform, even though they may require on-the-job training, sometimes in considerable amount. The skills needed for such jobs are highly specific, and seldom offered in generalized postsecondary programs. Figure 4 shows the 10 occupations with the most workers as of May 2011. Note that most of them require no postsecondary education at all (jobs like retail salespersons, cashiers, or office clerks). While registered nurses need an associate degree or more, and arguably some secretarial positions require some postsecondary training, the vast majority of jobs in these top occupations do not require much formal educational training beyond a bachelor's degree.

The BLS data identify 22 major occupational categories, with the percentage of total employment in each of these categories shown in Figure 5. The three largest categories, “office and administrative support,” “sales

FIGURE 5

MAJOR OCCUPATIONAL GROUPS AS A PERCENT OF US TOTAL EMPLOYMENT, MAY 2011

Source: U.S. Bureau of Labor Statistics

and related,” and “food preparation and service related” employ over 35 percent of all workers and are dominated by positions not requiring degrees. Note that the job categories rich with positions that the BLS believes requires college degrees, such as “architecture and engineering,” “legal,” “management,” and “life, physical and social science,” are among the smallest in terms of proportion of workers.

The data on large categories of jobs fail to fully convey the extent to which more and more college graduates have drifted to jobs requiring vastly less than college level education. Table 1 shows the 17 specific occupations that the BLS believes requires less than a high-school education, but which have at least 50,000 college graduates employed in them. In the three occupations “retail sales person,” “cashier,” and “waiters and waitresses” there are more than 1.7 million college graduates employed, and the other fourteen occupations listed in the table employ almost one million more college graduates. There are, of course, many other occupations requiring little education with significant numbers of college graduates, such as taxi drivers (36,945 have college degrees—15.4 percent of the total), and parking lot attendants (16,138 have at least a bachelor’s degree—12.9 percent of the total).

Why Are Recent College Graduates Underemployed?

TABLE 1
**JOBS REQUIRING LESS THAN A HIGH-SCHOOL DIPLOMA
 BUT EMPLOYING MORE THAN 50,000 COLLEGE GRADUATES, 2010**

Occupation	Percentage With B.A. or More	Number
Retail Sales Persons	24.60%	1,048,352
Cashiers	10.2	342,985
Waiters and Waitresses	14.3	323,223
Stock Clerks and Order Fillers	8.5	151,929
Food Preparation and Serving Workers	5.4	144,833
Janitors and Cleaners	5	115,520
Laborers, Freight, Stock, Material Movers	5.2	107,552
Personal Care Aides	10.5	90,405
Bartenders	16.5	83,028
Home Health Aides	8	81,416
Landscaping and Grounds-Keeping workers	6.8	78,302
Amusement and Recreation Attendants	23.5	61,406
Maids and Housekeeping Cleaners	4.3	61,374
Counter and Retail Clerks	14.5	60,828
Miscellaneous Agricultural Workers	4.8	56,959
Construction Laborers	5.6	55,933
Telemarketers	18	52,326
Total		2,916,371

Source: U.S. Department of Labor, Bureau of Labor Statistics

Notes: Numbers are calculated by multiplying the percent with a college degree by the total number employed, resulting in some rounding error.

Table 2 is similar, showing the number of college graduates working in 14 occupations for which the BLS says a high-school diploma or equivalent is needed for the position in question. The 14 listed occupations had more than 5.2 million college graduates working in them—while millions more were working in other jobs not listed. Immense financial resources are going to train millions of Americans for college, and if a major part of the reason we do so is to prepare those students for the world of work, then arguably a sizable amount of funds is not being utilized in an efficient fashion. To be sure, it is a judgment call as to whether a job requires a high-school or college diploma—and some jobs within a given occupation might truly demand more educational preparation than others. Nonetheless, the BLS classifications, which make a reasonable effort to properly classify occupational requirements, suggest the labor market disconnect problem is very real.

One objection that could be raised is that many the fastest-growing occupations of the future, according to BLS projections, are areas like biomedical engineering (the STEM disciplines) and other highly skilled occupations. Yet that assertion is, at the minimum, exaggerated. It is true that sometimes these

TABLE 2:
**FOURTEEN JOBS REQUIRING A HIGH-SCHOOL DIPLOMA
 BUT EMPLOYING MORE THAN 200,000 COLLEGE GRADUATES, 2010**

Occupation	Percentage With B.A. or More	Number
Sales Representatives, Wholesale, Manufacturing	47.10%	673,530
Office Clerks, General	17.6	519,323
Business Operations Specialists, All Other	48.4	515,073
Customer Service Representative	22	481,206
Managers, All Other	54.1	448,002
First-Line Supervisors, Food Prep. And Serving Workers	13.5	415,525
First-Line Supervision, Retail Sales Workers	24.6	398,397
Secretaries and Administrative Assistants	16.8	341,410
Bookkeeping, Accounting, Auditing Clerks	15	284,745
Sales Representatives, Services, All Other	46.5	261,005
Farmers, Ranchers, and Other Agricultural Managers	21.2	254,930
Teacher Assistants	18.2	234,452
Police and Sheriff's Patrol Officers	32.2	213,776
Executive Secretaries and Executive Admin. Assistants	16.8	207,665
Total		5,249,039

Source: U.S. Department of Labor, Bureau of Labor Statistics

Notes: Numbers are calculated by multiplying the percent with a college degree by the total number employed, resulting in some rounding error.

highly skilled occupations are projected to have a relatively large *percentage increase* in jobs—biomedical engineering, for example, is predicted by the BLS to face a 62 percent growth in the decade 2010 to 2020, the third highest of any occupation (lower, however, than personal care or home health aides, neither of which require a college degree). While that sounds impressive, the number of biomedical engineers in 2011 was 16,590, so a 62 percent increase means roughly 10,000 new jobs, a relatively small number.⁴⁸ By contrast, a mere 21.3 percent increase in the projected number of construction laborers means 212,400 new jobs—21 times as many new jobs as in biomedical engineering.

It is instructive to examine the 30 jobs with the largest projected growth in numbers from 2010 to 2020 (see Table 3). The most noticeable characteristic for our purposes relates to educational training. *Of the 30 jobs, only seven are positions requiring any postsecondary education whatsoever, and only four require a bachelor's degree or more.* Indeed, *more positions (10) require, in the BLS estimation, less than a high-school education, than require any form of postsecondary training.*

Even those statistics somewhat overstate the importance of more education in meeting the skill requirements of new jobs in the future. The 30 occupations listed in the table are expected to add nearly 9.3 million jobs in this decade, but barely 900,000 (or less than 10 percent) are in fields where the BLS believes a bachelor's degree or more is required. Even if one adds in the three other occupations requiring some

Why Are Recent College Graduates Underemployed?

TABLE 3
THIRTY OCCUPATIONS PROJECTED TO HAVE THE LARGEST GROWTH, 2010–2020

Occupation	Projected Job Growth	Education Requirement
Registered Nurse	711,900	Associates' Degree
Retail Salespersons	706,800	Less Than High School
Home Health Aides	706,300	Less Than High School
Personal Care Aides	607,000	Less Than High School
Office Clerks, General	489,500	High-School Diploma
Food Preparation and Serving	398,000	Less Than High School
Customer Service Reps.	338,400	High-School Diploma
Heavy, tractor-trailer truck drivers	330,100	High-School Diploma
Laborers, transportation	319,100	Less Than High School
Postsecondary teachers	305,700	Doctorate or Prof. Degree
Nursing aides, orderlies, attendants	302,000	Postsecondary non-degree
Childcare workers	262,000	High-School Diploma
Bookkeeping, accounting clerks	259,000	High-School Diploma
Cashiers	250,200	Less Than High School
Elem. School teachers exc. Special Ed	248,800	Bachelor's Degree
Receptionists and information clerks	248,500	High-School Diploma
Janitors and cleaners	246,400	Less Than High School
Landscaping, grounds-keeping workers	240,800	Less Than High School
Sales representatives, except scientific	223,400	High-School Diploma
Construction laborers	212,400	Less Than High School
Medical secretaries	210,200	High-School Diploma
Supervisors of office, support workers	203,400	High-School Diploma
Carpenters	196,000	High-School Diploma
Waiters and waitresses	195,900	Less Than High School
Security guards	195,000	High-School Diploma
Teacher assistants	191,100	High-School Diploma
Accountants and Auditors	190,700	Bachelor's Degree
Licensed practical, vocational nurses	168,500	Postsecondary non-degree
Physicians and surgeons	168,300	Doctorate or Prof. Degree
Medical Assistants	162,900	High-School Diploma

Source: Bureau of Labor Statistics

postsecondary training (most importantly registered nurses), the total jobs in occupations requiring some higher education experience rises to slightly fewer than 2.1 million, less than 23 percent of the total projected employment increase in the largest-growing occupations.

Underemployment Will Likely Continue During the Next Decade

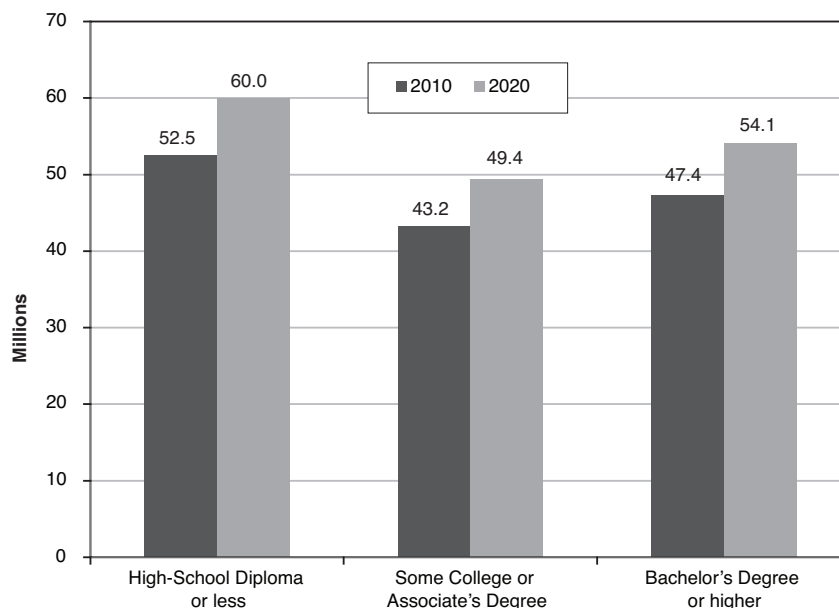
It is undeniable that job growth generally has been sluggish in the past five years as a consequence of the downturn in 2007 greatly aggravated by the 2008 financial crisis, and the subsequent very slow rate of recovery from that. No doubt, slow increases or actual decreases in employment have aggravated an already-existing phenomenon of underemployment for college graduates, but any thought that this is a temporary problem related to the business cycle is wishful thinking.

It is interesting to compare the educational requirements for projected future jobs with projections as to the number of employable college graduates. That comparison shows that the problem outlined above will worsen in the coming years if past trends and stated projections regarding the training of college students come true. More and more, a college degree will become far less than a sufficient condition for receiving an occupational ticket toward living a comfortable, affluent, middle-class life.

Figure 6 shows the BLS projected growth in jobs from 2010 to 2020 by the level of education required. Note that there is not a surge in jobs requiring a bachelor's degree or more, relative to jobs requiring lesser

FIGURE 6

ACTUAL AND PROJECTED NUMBER OF JOBS BY EDUCATIONAL REQUIREMENTS, 2010-2020

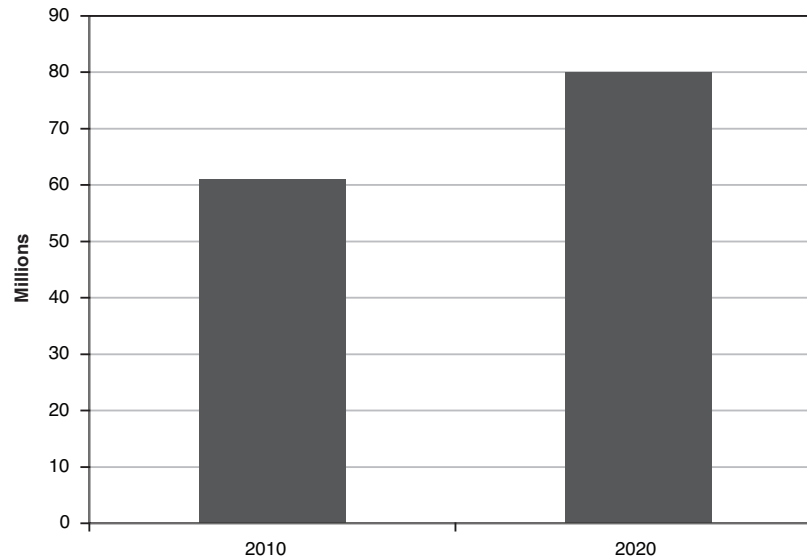


Source: U.S. Bureau of Labor Statistics, author's calculations

Notes: Figures for 2010 are actual while figures for 2020 are projected.

Why Are Recent College Graduates Underemployed?

FIGURE 7
AMERICANS WITH A BACHELOR'S DEGREE OR MORE, 2010 AND 2020



Source: U.S. Bureau of the Census, authors' calculations

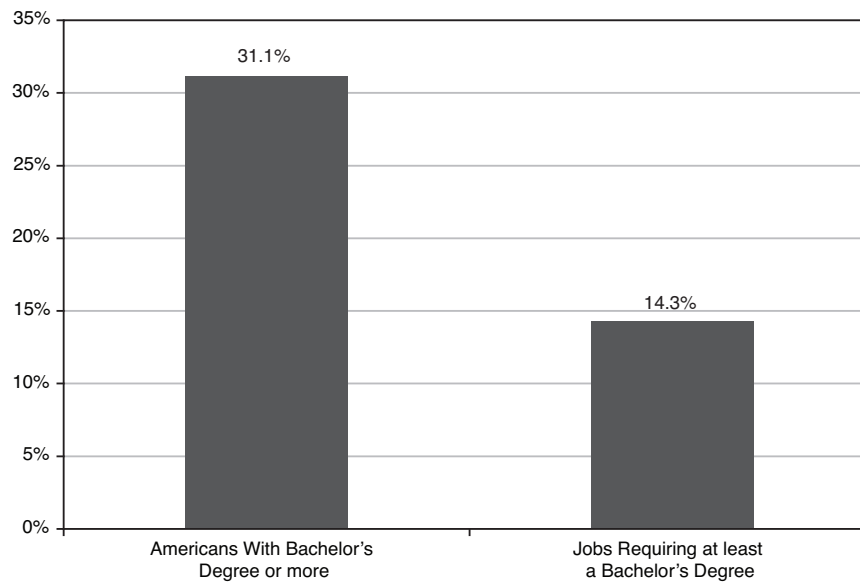
educational attainment. Indeed, there is a slightly larger numerical increase projected in jobs requiring a high-school diploma or less, relative to jobs requiring a bachelor's degree.

At the same time that there is a projected modest growth in the number of jobs requiring a bachelor's degree, the number of Americans with such degrees is projected to rise by over 30 percent, going from just more than 61 million in 2010 to just more than 80 million by 2020 (Figure 7). The aggregate growth of 19 million new college graduates by 2020 that we estimate is within 10 percent of the U.S. Department of Education's own projection of 20.5 million new bachelor's degrees awarded between 2010–11 and 2020–21.⁴⁹ According to the U.S. Department of Education, the annual compound growth rate in bachelor's degree recipients will be 1.5 percent from 2010–11 to 2020–21, about half the annual rate of increase from 1999–2000 to 2009–10.⁵⁰

It should be pointed out that our projections in degree growth are essentially based on past growth patterns. If President Obama's attainment goal were to be met (or similar goals by others, such as the Lumina Foundation's attainment goal), the degree growth will be greater than indicated in Figure 7 (indeed, as Arthur Hauptman has pointed out, reaching President Obama's 2020 attainment goal will require a *quadrupling* in the annual growth rate in the attainment rate).⁵¹ In other words, the growing mismatch between the number of college graduates and the actual number of jobs requiring such an education is conservatively stated here, as it assumes the Obama-Lumina goals are not fully achieved.

Therefore, according to our estimates, we project that the number of adult Americans with bachelor's degrees will grow over 31 percent during the current decade, more than double the percentage growth (14 percent) in jobs requiring at least a bachelor's degree (see Figure 8). We are essentially creating a glut of overeducated persons who will be forced to perform relatively simple unskilled tasks requiring little in

FIGURE 8
**PROJECTIONS IN COLLEGE GRADUATE GROWTH VS. JOBS REQUIRING A COLLEGE DEGREE GROWTH,
 2010 TO 2020**



Source: U.S. Bureau of Labor Statistics, authors' calculations

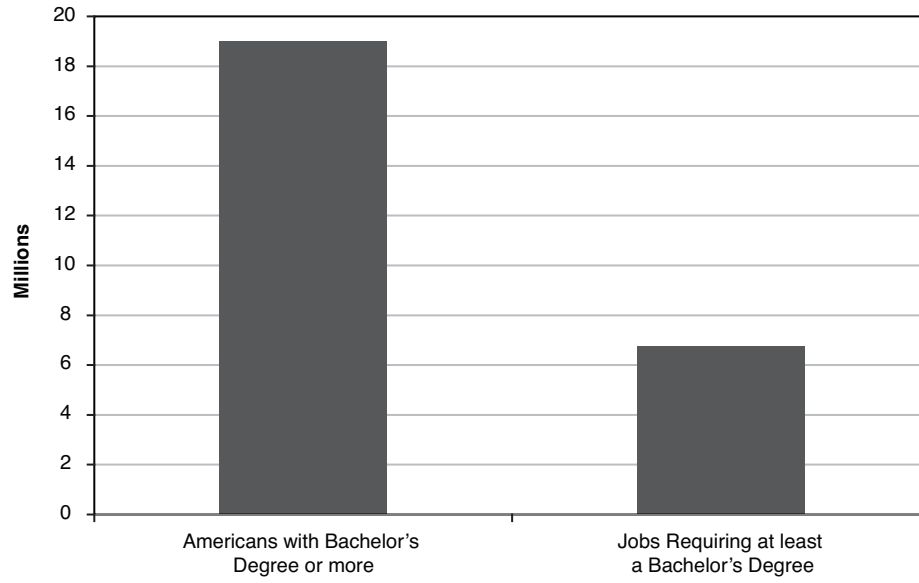
the way of educational skills. Why? Is there, as we suspect, a huge knowledge gap, with students implicitly assuming that no gap exists between job availability and college graduates applying for jobs? Worse, does the educational system, beginning with high-school guidance counselors and then by college admissions officers, paint an overly rosy picture? Are colleges trying to maximize admissions and tuition revenues, even though the very students those institutions are supposed to help are the ones who will be left with the tab? Obviously, some kids have enormous potential, both academically and vocationally—some graduates are still getting good jobs. Grades, test scores, student leadership skills, and other good predictors of success should give school personnel knowledge necessary to more appropriately counsel students into educational settings that would more clearly match their ultimate vocational potential.

Figure 9 summarizes the information from the previous three graphs. The number of college graduates is expected to grow by 19 million, while the number of jobs requiring a bachelor's degree is expected to grow by fewer than 7 million. We are expected to create nearly three new college graduates for every new job requiring such an education. Currently, more than 20 million college graduates are underemployed—working in jobs requiring less education than they have, but that number will likely soar to nearly 30 million in the coming decade as a consequence of the number of graduates growing by 12 million more than the number of jobs.⁵²



Why Are Recent College Graduates Underemployed?

FIGURE 9
GROWTH IN THE NUMBER OF COLLEGE GRADUATES VS. JOBS REQUIRING A COLLEGE DEGREE,
2010 TO 2020



Source: U.S. Bureaus of the Census, Labor Statistics, and authors' calculations



Is The College Graduate Underemployment Problem A Recent Development?

It would at least be possible, mathematically, that the discussion above misstates things a bit—perhaps a significant portion of college graduates have always decided to take relatively less-skilled, lower-paying jobs for less stress, greater job security, better geographic area, etc.” There are college graduates who have extolled the virtues of blue collar jobs requiring less than a college degree, and even written books about it.⁵³ One of us knows a college graduate who recently gave up a good-paying, white-collar job to become an electrician. Perhaps we are making too big of a deal of the “labor market disconnect hypothesis.” It could be that college graduates actually want to do those relatively unskilled kinds of jobs, although if this is true, it still raises the issue of whether the taxpayers should heavily subsidize the costs associated with providing a degree that has little vocational relevance.

In order to test the hypothesis that underemployment is not a recent phenomenon, we used the 1970 Census of Population to look at occupations by educational attainment of the workers. There were a number of problems that posed challenges for matching the results to contemporary data, but we believe that our methods allow for an appropriate comparative analysis. For example, in 1970, the Census had a category for those with “four years or more” of college, rather than “bachelor’s degree or more.” We assumed, usually but not always accurately, that the two terms mean roughly the same thing. Also, the descriptions of some occupations changed a bit over time. A further complication is the fact that some data were available for only one gender in 1970, because some occupations still were largely single sex in nature in that era.

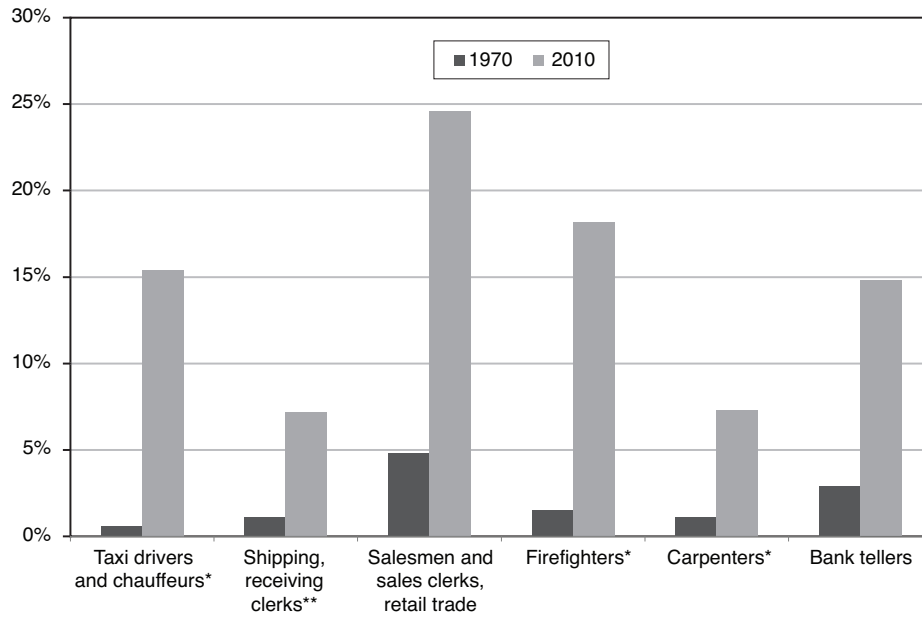
Those caveats aside, we took six occupations that have not changed dramatically in the skills required during the past 40 years or so—jobs like taxi drivers, sales clerks in retail trade, firefighters, and bank tellers. Figure 10 shows the percentage of occupants of those positions with four years or more of college in 1970, as well as those with bachelor’s degrees or more in 2010. Note in every case there was, at the very least, a quadrupling in the proportion of college trained workers. The phenomenon of the college-educated person holding a job requiring little formal education training appears on the basis of this type of evidence, at least for the occupations we examine, to have arisen mostly in the past four decades or so. It was rare for even three percent of jobs in fields requiring no postsecondary education in 1970 to be held by college graduates, whereas today there are a number of such occupations with 15 percent or more college graduates.

Taxi drivers and firefighters are prime examples of the phenomenon we are describing. Only one in every 100 taxi drivers in 1970 was a college graduate—today at least 15 are. In 1970, a fire department with 50 firefighters would typically have one college graduate (the chief?); today, a similarly sized department would have around nine such graduates. One in four sales clerks in retail trade have college degrees today, compared with fewer than one in 20 in 1970.

It is possible, by relying on the previous work of others to generalize this trend of rising underemployment of college graduates across the labor market. Daniel Hacker, using aggregated data from the Current Population Survey (CPS), has calculated that, while 10.8 percent of college graduates in the labor force in

Why Are Recent College Graduates Underemployed?

FIGURE 10
**PERCENTAGE OF EMPLOYEES IN SELECT OCCUPATIONS WITH A BACHELOR'S DEGREE OR MORE,
 1970 AND 2010**



Sources: U.S. Bureau of the Census, Labor Statistics, and authors' calculations

Notes: *1970 data only available for working males. **1970 Data only available for working females. The "salesmen and sales clerk, retail trade" definition in 1970 becomes "retail salespersons" in 2010; the "shipping, receiving clerk" classification of 1970 becomes "shipping, receiving, and traffic clerks" in 2010.

1967 were employed in jobs not requiring a degree, the proportion had risen to 17.5 percent by 1990.⁵⁴ Pryor and Schaffer, using less aggregated CPS data, also documented a rising trend in the employment of college graduates in high-school jobs from 1971 to 1995 (they also found that the underemployment trend over time is partly dependent upon the precise definition one uses to define a high-school job).⁵⁵ Further, as our previous research with our colleagues suggested, the underemployment of college graduates is higher today than it was twenty, thirty, or forty years ago.⁵⁶



Not All College Degrees Are Created Equal

In most of our analysis of college graduates and labor markets, we compare broad aggregates, such as “college graduates and high-school graduates.” Yet there are vast variations in labor-market performance within and among colleges and universities. Two forms of disaggregation of the data are particularly essential: by field of study (major) and by the institution awarding the degree or credential. Graduates in some occupations do vastly better than in others—with starting salaries of some majors being roughly double those for others. Moreover, the graduates of prestigious private and even high-quality flagship state universities typically have a better career trajectory (as measured by earnings) than do those attending mid- or lower-quality state schools, institutions from which only a minority of those entering the school even get a degree.

Table 4 presents the earnings of university and college students for 32 different major fields.⁵⁷ An examination of beginning salary shows that whereas social work majors start at under \$34,000 a year on average, for electrical engineers, the corresponding figure is over \$60,000. Mid-career (10 to 19 years after graduation) disparities are even larger. While electrical engineers and economists average over \$100,000 a year, those in social work average under \$42,000. We would note, however, that some humanities type majors actually do rather well; for example, the mid-career earnings of philosophy majors exceed those of business administration majors, and history majors do nearly as well.

Similarly, Figure 11 gives average mid-career earnings for 21 schools in three cluster, a sample comprised of seven elite private schools (Harvard, Columbia, Northwestern, Stanford, and Duke universities, and Williams and Pomona colleges), seven flagship state universities (Rutgers, Michigan, Virginia, California-Berkeley, Iowa, Colorado, and Georgia), and seven mid- or lower-tier state schools (San Jose State University, Boise State, University of Texas at San Antonio, Chicago State University, Slippery Rock State University, Kent State University, and the University of North Carolina at Charlotte). Again, significant differences exist among the schools, although the differences are muted somewhat by using the averages for the three clusters of institutions.⁵⁸ The bottom line, however, is clear: Majors studied and schools attended do matter in the labor market.



Why Are Recent College Graduates Underemployed?

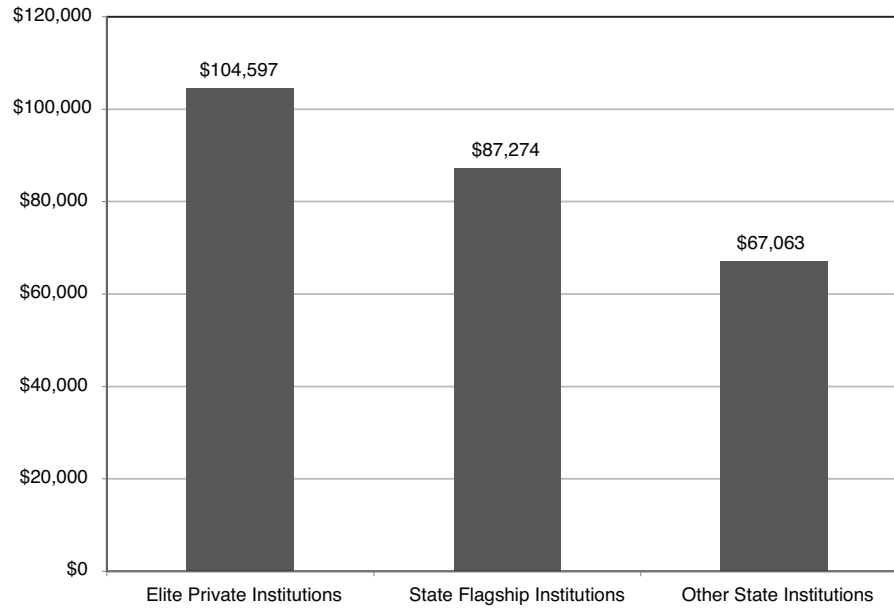
TABLE 4
STARTING AND MID-CAREER SALARIES, 32 COLLEGE MAJORS

Major	Average Starting Salary	Average Mid-Career Salary
Accounting	\$46,500	\$77,600
Anthropology	37,600	63,200
Art History	36,300	62,400
Biology	39,500	71,800
Business Administration	42,900	73,000
Chemistry	42,900	82,300
Communications	38,700	68,400
Computer Science	56,400	97,400
Drama	35,600	56,600
Economics	50,200	101,000
Education	36,200	54,100
Electrical Engineering	60,200	102,000
English	37,800	66,900
Finance	48,500	89,400
Geography	40,400	69,300
History	38,800	70,000
Hospitality and Tourism	37,000	54,300
Interior Design	35,700	59,900
International Relations	41,400	80,500
Journalism	36,300	65,300
Mathematics	47,000	93,600
Mechanical Engineering	58,900	98,300
Music	34,000	52,000
Nursing	54,900	69,000
Philosophy	40,000	76,700
Psychology	36,000	61,000
Radio and Television	34,000	67,000
Religious Studies	35,300	57,500
Social Work	33,400	41,600
Spanish	35,600	52,600
Statistics	48,600	94,500
Zoology	37,000	74,400

Source: Philip Coelho and Tung Liu, "The Returns to College Education," based on 2009 data from Payscale.com.



FIGURE 11
AVERAGE MID-CAREER SALARIES: THREE TYPES OF SCHOOLS



Sources: Coehlo and Liu, "Returns To College Education," PayScale.com, authors' calculations

Two Possible Scenarios: Falling College Enrollments or Master's in Janitorial Studies Degrees?

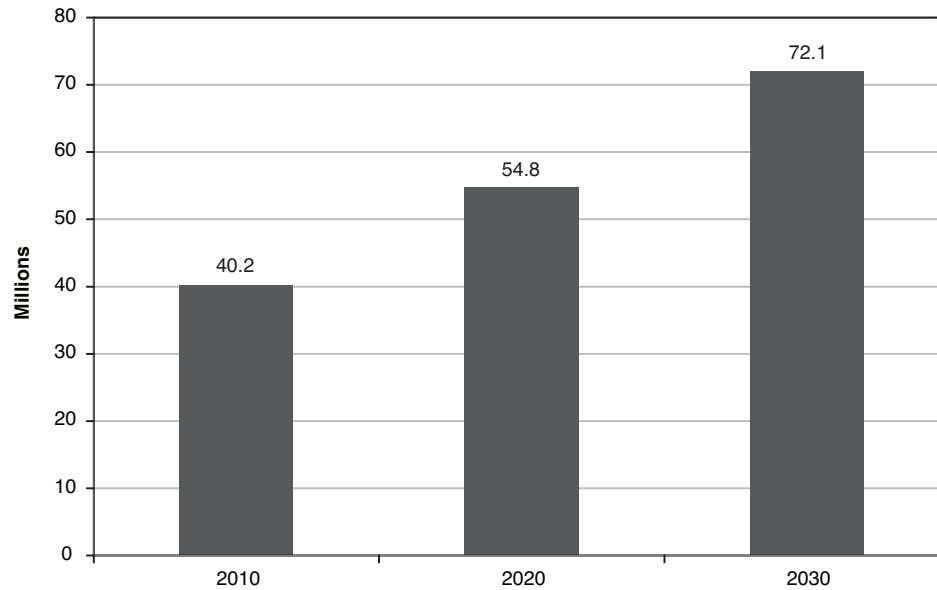
Human beings respond to changing circumstances. As the number of students facing relatively low-paying jobs and relative high student-loan debt grows, one possibility is more and more of them will simply say they cannot afford this, and college enrollments will start declining, or at least stop growing. When the value of an investment declines, people shun it and invest their resources elsewhere. Entrepreneurs, seeing that trend, may start offering lower-cost ways that people can certify employment competence. One possibility is low-cost degrees heavily utilizing online learning and incorporating a good deal of massive open online courses (MOOCs) available for minimal-to-no cost to the student. Organizations such as Udacity, Coursera, edX, StraighterLine, and the Saylor Foundation would see exponential enrollment growth in their courses, and ways would be devised, possibly despite accrediting agency opposition, to package these courses into degrees or some alternative form of certification. Another possibility is that someone—ACT, SAT, Underwriters Laboratories, some foundation or state government—might come up with a standardized American College Equivalence Test (ACET) that correlates well with the intellectual and knowledge attributes of actual college graduates, offering a non-degree way of demonstrating competency.

In the first scenario, the very high-quality, expensive selective admission schools would probably survive—most are well endowed, in any case. The former blanket use of a college degree *per se* as a screening device would become less frequent, but the quality of college would remain an important way of identifying superlative future workers. There would continue to be a frenzied attempt to get into the million or so slots available at the elite and quasi-elite private and public universities whose graduates are perceived to be a cut above the average college graduate attending a second- or third-tier institution. Indeed, some of those less-distinguished, less-endowed institutions might be forced to close down, as cash-strapped state legislatures and an even more financially strained federal government reduce subsidies.

There is another scenario, one that fits well with the actual historical experience of the last several decades. While people will become increasingly aware that a bachelor's degree is no longer a very assured ticket to success, more and more people will try to get a competitive edge in the labor market by obtaining master's or even doctoral degrees to demonstrate competence. We jokingly predict that colleges will offer a master's degree in Janitorial Studies within a decade or two and anyone seeking employment as a janitor will discover no one will hire unless proof of possession of such a degree is presented. If education correlates well with positive character and intellectual traits from the standpoint of employment, more education will enhance the probability that a student can become employed in a well-paid job. Just as a bachelor's degree gives current applicants for bartender jobs an edge over those with just a high-school diploma, so a master's degree holder will have an advantage over those with a mere bachelor's degree.

At the same time, the pursuit of the second scenario will be very expensive. Obviously, five or six years of college cost more than four. But from a broader societal perspective, it is also a costly scenario owing to future demographic trends. Our nation, along with most others in the industrialized world, faces a daunting problem arising from population aging. The proportion of Americans aged 65 or older (traditionally the age cohort that retires and exits the labor market) is growing rapidly, as Figure 12 shows. In

FIGURE 12
PROJECTED NUMBER OF AMERICANS OVER 65, 2010–2030



Source: U.S. Bureau of the Census

such a situation, Americans face a tremendous financial strain owing to the extremely high cost of providing for those individuals. We will change our behavior to meet that challenge—for example, more Americans in their late 60s or even early 70s will continue to work. But that also means the luxury of allowing younger Americans to delay their entry into the labor force to, say, 24 or 25, might need to be curtailed to give the relatively smaller proportion of Americans of working age a chance to maximize their work effort to sustain a larger number of older as well as younger Americans.



Conclusions: Underemployed and Overinvested

The mismatch between the educational requirements for various occupations and the amount of education obtained by workers is large and growing significantly over time. The problem can be viewed two ways. In one sense, we have an “underemployment” problem; College graduates are underemployed, performing jobs which require vastly less educational tools than they possess. The flip side of that, though, is that we have an “overinvestment” problem: We are churning out far more college graduates than required by labor-market imperatives. The supply of jobs requiring college degrees is growing more slowly than the supply of those holding such degrees. Hence, more and more college graduates are crowding out high-school graduates in such blue-collar, low-skilled jobs as taxi driver, firefighter, and retail sales clerks.⁵⁹ Credential inflation is pervasive. And, as Hernstein and Murray noted nearly two decades ago, one by-product of this phenomenon is a dumbing down of the college curriculum; as they put it “credentialism... is part of the problem, not the solution.”⁶⁰

That suggests the earnings advantage associated with a bachelor’s degree will change over time. By one way of looking at it, the college degree becomes less worthwhile financially: If one compares earnings of those with bachelor’s degrees with that of all workers (not merely high-school graduates), the day may come when the bachelor’s degree will pay less than that of all workers, as the proportion of workers with more than bachelor’s degrees comes close to approximating that of those with less than a four-year diploma. The college degree will be the new normal, and the credential inflation leading to more and more college-educated taxi drivers will continue to escalate. Yet this is not to say going to college is unnecessary: Indeed, it would be almost impossible to get a job without a degree. Vocational success would require even more education.

But at what cost? Can we afford to expend \$100,000 or more in resources giving kids a college degree, only to see them take taxi driver jobs for which the college education added hardly a scintilla of employment skill? Can we afford to lose the labor services of 18-to-22 year olds going to college for little employment advantages, persons who could start driving a taxi or working as a bank teller at 18 instead of 22? In an era where the worker-to-dependent ratio is rapidly falling, the underemployed college graduate is an expensive luxury we can ill afford as a nation. To be sure, given wide variations in earnings by college attended and by major, generalizations are dangerous, and maybe some forms of college training and some institutions deserve greater support than others. Besides, it is not as if reducing societal investment in higher education would *necessarily* adversely affect national output; as Paul Barton observes, despite the handwringing in the past about an emerging shortage of highly educated workers in the U.S., “since 1995, productivity has accelerated, with no demonstrable improvement in workforce skills or acceleration in job requirements during the period.”⁶¹

All of this calls into question the wisdom of the “college for all” movement. Does it make sense to become the world’s leader again in the proportion of young adults with college degrees? Is the goal of individuals like President Obama or groups like the Lumina Foundation to increase college degree attainment desirable? Should we look for new and cheaper ways to assure employee competency? Should we invest less in four-year degree programs and more in cheaper training, including high-school vocational



education that once was fashionable?⁶² Perhaps the federal government should reduce its involvement in the higher-education business, much like some states seem to be starting to do out of fiscal imperatives imposed by balanced-budget requirements that the federal government does not face. If fewer students could get Pell Grants or subsidized student loans, enrollments might very well fall, an outcome we perceive not to be a bad thing from a labor-market perspective.⁶³

That raises questions that go beyond higher education. As the number of years of education of workers rises in virtually all non-professional and technical jobs, is the reason ultimately that really it takes, say, 14 or 15 years of schooling to offer the same learning that previously was accomplished in 12 years? Is the deterioration in the quality of our primary and secondary education a contributing factor in the credential inflation obvious at the postsecondary level? That suggests there may be two major economic issues facing higher education. First, it is too costly, too inefficient, too shielded from the useful market forces of “creative destruction.” Second, because of massive overinvestment reflecting indifference to labor-market realities, we are vastly wasting scarce resources, both public and private.

To be sure, *if left alone*, market forces will likely solve the problem. Reading stories of underemployed college graduates with massive debt, more will start rejecting the mantra that everyone should go to college. Enrollments will fall, and in time the rate of return on college investments will increase again as the labor-market disconnect problem is reduced. There are already signs that is beginning to happen. The *Wall Street Journal* recently proclaimed, “demand for four-year college degrees is softening.”⁶⁴ Yet public policies such as massive federal loan subsidies often distort outcomes and prevent a stable and economically effective equilibrium position from being reached. As someone once joked, “when we see light at the end of the tunnel, the government adds more tunnel.”

A decade ago, while contemplating calls in Britain for increased public investment in education (rhetoric that is very similar, if not identical, to the rhetoric today in the United States), the British educator Alison Wolf perceptively opined,

Education is big because it is seen as the engine for economic growth, a sure-fire route to future prosperity and victory in a global competition... the belief in education for growth runs deep and wide beyond our political classes, replacing socialism as the great secular faith of our age.⁶⁵

Economists for generations have long accepted the law of diminishing returns—when one adds more and more resources, at some point the marginal contribution to output falls. The law applies to education as to almost everything in life. One manifestation of it in American university life is the underemployment of college graduates; we might be seriously overinvested in higher education. This study adds to that concern, and further suggests the common assumption that increased investment in higher education promotes economic growth is highly questionable.

Notes

1. President Barack Obama, “Address to Joint Sessions of Congress,” February 24, 2009, available at: http://www.whitehouse.gov/the_press_office/Remarks-of-President-Barack-Obama-Address-to-Joint-Session-of-Congress/.

2. Arthur Hauptman, “Increasing Higher Education Attainment in the United States: Challenges and Opportunities,” in *Getting to Graduation: The Complete Agenda in Higher Education*, eds. Andrew P. Kelly and Mark Schneider (The Baltimore: Johns Hopkins University Press, 2012), 27.

3. Lumina Foundation, “The Big Goal,” available at: http://www.luminafoundation.org/goal_2025.html. The Lumina goal is to “increase the proportion of American with high-quality degrees and credentials to over 60 percent by the year 2025.” Perhaps tellingly, Lumina released a story in March 2012, expressing uncertainty that that goal is realistic. See Lumina Foundation, “New report finds modest gains in America’s college attainment rates.” http://www.luminafoundation.org/newsroom/news_releases/2012-03-26.html. Similarly, the Gates Foundation has set goals for educational attainment and credentialing growth with the statement “We seek to ensure that all students graduate from high school ready for college and career and prepared to complete a postsecondary degree or certificate with value in the workplace.” See Bill and Melinda Gates Foundation, “United States Education,” available at <http://www.gatesfoundation.org/united-states/Pages/education-strategy.aspx>.

4. Hauptman, p. 27. The publication to which Hauptman refers is: Richard Kazis, Joel Vargas, and Nancy Hoffman, eds., *Double the Numbers* (Cambridge: Harvard Education Press, 2004).

5. Ben Bernanke, Class Day Commencement Address, Harvard University, June 4, 2008. Bernanke states, “In the long term, however, the best way by far to improve economic opportunity and to reduce inequality is to increase the educational attainment and skills of American workers.”

6. Anthony P. Carnevale, Nicole Smith, and Jeff Strohl, *Help Wanted: Projections of Jobs and Education Requirement Through 2018*, (Washington, D.C.: Georgetown University Center on Education and the Workforce, June 2010). Carnevale and colleagues at Georgetown University’s Center on Education and the Workforce argue that the economy will require many millions of new college graduates during the next decade to remain competitive. See, for example, Anthony P. Carnevale, Tamara Jayasundera, and Ban Cheah, *The College Advantage: Weathering the Economic Storm*, (Washington, D.C.: Georgetown Public Policy Institute, September 2012) and Anthony P. Carnevale and Stephen J. Rose, *The Undereducated American*, (Washington, D.C.: Georgetown University Center on Education and the Workforce, June, 2011).

7. See, for example, Sandy Baum, Jennifer Ma, and Kathleen Payea, *Education Pays 2010: The Benefits of Higher Education for Individuals and Society*, (Washington D.C.: The College Board, 2010). See also, Bureau of Labor Statistics, *Education Pays*, available at <http://www.bls.gov/opub/working/page6a.htm>.

8. Pew Economic Mobility Project, “How Much Protection Does a College Degree Afford? The Impact of the Recession on Recent College Graduates,” January 2013, accessed at <http://www.pewstates.org/research/reports/how-much-protection-does-a-college-degree-afford-85899440520>.

9. For an archive of the research conducted by Andrew Sum and colleagues at Northeastern University’s Center for Labor Market Studies (some of which deal with the issue of “malemployment” of college graduates), see http://iris.lib.neu.edu/clms_pub/.

10. Hope Yen, “One in Two New Graduates are Jobless or Underemployed,” Associated Press, April 24, 2012, available at: http://www.msnbc.msn.com/id/47141463/ns/business-stocks_and_economy/#.UOcQkOT7KkB.



Why Are Recent College Graduates Underemployed?

11. Two examples include: Richard K. Vedder, *Going Broke By Degree: Why College Costs So Much*. Washington D.C.: AEI Press, 2004, and his *Twelve Inconvenient Truths about American Higher Education* (Washington, D.C.: Center for College Affordability and Productivity, 2012), available at: <http://centerforcollegeaffordability.org/research/studies/12-inconvenient-truths>.

12. Richard Vedder, et al., *From Wall Street to Wal-Mart: Why College Graduates Are Not Getting Good Jobs*, (Washington, D.C.: Center for College Affordability and Productivity, December 2010), available at: <http://centerforcollegeaffordability.org/research/studies/from-wall-street-to-wal-mart>.

13. See, for example, George Leef, *The Overselling of Education*, (Raleigh, NC: The John William Pope Center for Higher Education Policy, September 2006), available at: http://www.johnlocke.org/acrobat/pope_articles/the_overselling_of_higher_education_report.pdf.

14. Miller Center for Public Policy, *Debate: Education and the Economy*, Debate, Vedder, Sum, Spellings and Lomax (Charlottesville, VA: Miller Center National Debates, 2010), Public Broadcasting Service, available at: http://fora.tv/2010/02/26/Debate_Education_and_the_Economy.

15. Alison Wolf, *Does Education Matter: Myths About Education and Economic Growth*, (London, Penguin Books, 2002), 244.

16. See Richard B. Freeman, *The Overeducated American*, (New York, NY: Academic Press, Inc. 1976). See also Frederic L. Pryor and David L. Schaffer, *Who's Not Working and Why: Employment Cognitive Skills, Wages and the Changing U.S. Labor Market* (Cambridge: Cambridge University Press, 1999).

17. Richard K. Vedder, *Over-Invested and Over-Priced: American Higher Education Today* (Washington, D.C.: Center for College Affordability and Productivity, 2007), available at: http://www.centerforcollegeaffordability.org/uploads/Over_Invested_Final.pdf.

18. That is the same argument made by Pryor and Schaffer in *Who's Not Working and Why*. As Pryor and Schaffer put it, in the modern labor market, there is “a cascading displacement effect, whereby workers with higher education displace workers with less education,” p. 12.

19. According to Baum, Ma, and Payea in *Education Pays 2010*, in 2008, the bachelor's degree recipient with earnings at the 25th percentile for all bachelor's degree recipients still had earnings greater than the median for those persons who attended some college but never received a degree. In other words, more than 75 percent of all college graduates with bachelor's degrees had greater earnings than half of all college dropouts.

20. The data are based on Current Population Survey data reported annually by the Bureau of the Census. See <http://www.census.gov/hhes/www/income/data/historical/people.html> for data, especially tables 16 through 32.

21. Pryor and Schaffer, *Who's Not Working and Why*, p. 13.

22. *Ibid.*, p. 41.

23. Neeta P. Fogg and Paul E. Harrington, “Rising Mal-Employment and the Great Recession: The Growing Disconnection between Recent College Graduates and the College Labor Market,” *Continuing Higher Education Review* 75 (Fall 2011), 75. While some of the increase can be attributed to the 2007-09 recession (which hit labor markets particularly hard), Fogg and Harrington point out that one-half of the increase in malemployment of college graduates from 2000 to 2010 occurred between 2000 and 2007, before the onset of the recession.

24. See John Hattie and H.W. Marsh, “The Relationship Between Research and Teaching: A Meta-Analysis,” *Review of Educational Research* 66, No. 4(1996):507. Hattie and Marsh conclude that their “meta-analysis of 58 studies demonstrates that the relationship [between research and teaching] is zero.”

25. The characterization of labor as “human capital” was popularized by Theodore Schultz. See his “Investment in Human Capital,” *American Economic Review* 51 (March 1961), 1-17, or his “Capital Formation by Education,” *Journal of Political Economy* 68 (December 1960), 571-583. The first major and still standard comprehensive treatment of the topic

is found in Gary Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education* (New York: Columbia University Press for the National Bureau of Economic Research, 1964).

26. That work, largely conducted by Jordon Templeton under the direction of Richard Vedder, has not been published in part because of lingering concerns over issues of methodology, and thus the comments here are mentioned to be suggestive rather than authoritative. Certainly the very substantial earnings differential by age even after controlling for educational attainment suggests the “learning by doing” on-the-job component is very important.

27. That is not to say that most individual employers directly make payments to employees that exceed 60 percent of revenues or costs. Some of the inputs into the production process are purchased from other providers who, in turn, incur personnel costs.

28. *Griggs v. Duke Power Co.* 401 U.S. 424 (1971).

29. Bryan O’Keefe and Richard Vedder, *Griggs v. Duke Power: Implications for College Credentialing*, (jointly produced by the John W. Pope Center for Higher Education Policy and the Center for College Affordability and Productivity, October 2008).

30. While definitive IQ data by educational attainment are not routinely collected, the positive association between intelligence and educational attainment is well accepted, and is discussed in the magisterial work by Richard J. Herrnstein and Charles Murray, *The Bell Curve: Intelligence and Class Structure in American Life* (New York: Free Press, 1994). In his *Real Education: Four Simple Truths for Bringing America’s Schools Back to Reality* (Washington, D.C.: AEI Press, 2008), Murray asserts that (p. 69) “For many years, the consensus intellectual benchmark for dealing with college-level material was an IQ of around 115.” Relevant to this study, Murray also asserts (p.110) that an IQ of 120 “is a good ballpark figure for the academic ability needed to stand out in the jobs that are held by the people who run this country.” Admissions tests like the SAT are highly correlated with IQ.

31. Charles Murray, sometimes with associates, has spent decades arguing that innate intelligence is a very important factor in explaining differences in productivity and incomes. The seminal work, of course, is his book with Richard J. Herrnstein, *The Bell Curve*, but see also his *Real Education*.

32. Catherine Rampell, “Degree Inflation? Jobs That Newly Require B.A.’s,” *New York Times*, December 4, 2012, available at: <http://www.economix.blogs.nytimes.com/2012/12/04/degree-inflation-jobs-that-require-b-a-s/>.

33. The seminal paper on education as a signaling device is Michael Spence, “Job Market Signaling,” *Quarterly Journal of Economics*, 87 (August 1973), 355-74. See also the paper adopted from his Nobel Prize lecture on the topic, “Signaling in Retrospect: The Informational Structure of Markets,” *American Economic Review* 92 (June 2002), 434-59. Spence drew insights based on the newly emerging interest in the economics of information, most clearly elucidated by George Stigler in his “The Economics of Information,” *Journal of Political Economy*, 69 (June 1961), 213-225. An important pioneer in examining the empirical wage-education relationship is Jacob Mincer. See his *Schooling, Experience and Earnings* (New York: Columbia University Press for the National Bureau of Research, 1974).

34. The book, tentatively titled *The Case Against Education*, appears to draw heavily on the distinction between “signaling” associated with education as opposed to the pure learning dimensions (based on reading preliminary drafts of parts of the book and discussion with the author).

35. Jean-Baptiste Say was a French economist who lived from 1767 to 1832. Many considered him to be a rather superficial popularizer of Adam Smith’s work; see, for example, Joseph A. Schumpeter’s authoritative *History of Economic Analysis* (New York: Oxford University Press, 1954), pp. 471-72. Yet his exposition of his law of markets rekindled an increase in “supply side” economics that has been an important development of the past 40 years. Two works of note by Say admirers include Thomas Sowell, *Say’s Law: An Historical Analysis* (Princeton, NJ: Princeton University Press, 1972) and W.H. Hutt, *A Rehabilitation of Say’s Law* (Athens, OH: Ohio University Press, 1975).

36. That is based on Census data and is discussed in greater detail below (see, for example, Figure 3).





Why Are Recent College Graduates Underemployed?

37. For example, according to the latest projections published by the U.S. Department of Education, the annualized compound rate of growth in college students aged 18-to-24 years old is expected to be only 0.85% between 2010 and 2021 (well below the annual compound growth rate of 3.09% for the period 1996-2010). See William J. Hussar and Tabitha M. Bailey, *Projections of Education Statistics to 2021* (NCES 2013-008), U.S. Department of Education, National Center for Educational Statistics (Washington, D.C.: U.S. Government Printing Office, January 2013), available at: <http://nces.ed.gov/pubs2013/2013008.pdf>.

38. *US News and World Report* “Best Colleges” 1988 and 2013. 2013 ranking available at: <http://colleges.usnews.rankingsandreviews.com/best-colleges>.

39. *Forbes* “America’s Best Colleges 2012,” available at <http://www.forbes.com/top-colleges/list/>. Full disclosure: the Center for College Affordability and Productivity compiles the rankings used by *Forbes*.

40. On Richard Vedder on “country clubization” and on the socialization dimension of higher education generally, see June Kronholtz, “Colleges Get Building Fever,” *Wall Street Journal*, May 18, 2005 available at <http://online.wsj.com/article/0,,SB11163809450873656400.html> or Sam Dillon, “Share of College Spending for Recreation is Rising,” *New York Times*, July 9, 2010, available at: <http://nytimes.com/2010/07/10/education/10education.html>.

41. We have been told, for example, that High Point University in North Carolina has valet service for students, ice cream trucks around campus for “free” snacks, and a hot tub for students to occasionally enjoy. See Renee Montagne, “High Point University Boosts Its ‘Wow’ Factor,” *Morning Edition*, NPR, July 2, 2008, available at: <http://www.npr.org/templates/story/story.php?storyId=92126524>.

42. All information contained in that paragraph is from “Measures of Education and Training,” *Bureau of Labor Statistics: Employment Projections*, May 4, 2012, available at: http://www.bls.gov/emp/ep_education_tech.htm.

43. See Anthony Carnevale, “College Is Still Worth It,” *Inside Higher Ed*, Jan. 14, 2011. For an explanation of why the description used by Carnevale is incorrect, see Richard Vedder, “For Many, College Isn’t Worth It,” *Inside Higher Ed*, Jan. 20, 2011.

44. Paul E. Harrington and Andrew M. Sum, “College Labor Shortages in 2012?” *The New England Journal of Higher Education*, November 8, 2010, available at: <http://www.nebhe.org/thejournal/college-labor-shortages-in-2012/>.

45. Paul E. Barton, “How Many College Graduates Does the U.S. Labor Force Really Need?” *Change*, January/February 2008, available at: <http://www.changemag.org/Archives/Back%20Issues/January-February%202008/abstract-how-many-graduates.html>. (Emphasis in original). In fact, Barton keenly observes that even using the BLS data on its face (as we do) leads to “[o]verestimates of the educational requirements of the future workforce” because it is “based on changes in average employment... in an occupation, rather than job openings... in that occupation.” Because job turnover is often higher in occupations requiring less education, in the future U.S. job needs for those occupations with lower educational requirements may actually be higher than we state.

46. For example, Fogg and Harrington estimate that the overall rate of malemployment (a term which they define precisely) for college graduates in 2010 was 28.2 percent. The rate of mal-employment, they found, varies with the age cohort of college graduates; the rate of mal-employment for college graduates aged 20-24 was 39.1 percent while the corresponding rate for college graduates aged 55-64 was 29.6 percent. See Fogg and Harrington, p. 57.

47. That is precisely the same phenomenon that Pryor and Schaffer observed more than a decade ago when they wrote, “Jobs for less-educated workers have increased faster than the population with the corresponding educational credentials while, simultaneously, jobs for more-educated workers have increased slower than the more-educated population.” Pryor and Schaffer, *Who’s Not Working and Why*, 3.

48. BLS News Release 12-0548, *Occupational Employment and Wages-May 2011*, issued March 27, 2012.

49. Hussar and Bailey, *Projections of Education Statistics to 2021* (NCES 2013-008), Table 33.

50. *Ibid.*



51. Hauptman, p. 36.
52. The growth in the number of truly underemployed will likely be less than the number of college graduates not working in jobs for which a bachelor's degree or more is traditionally expected because some graduates voluntarily chose not to work.
53. Matthew B. Crawford, *Shop Class as Soulcraft: An Inquiry Into The Value Of Work*, (New York: The Penguin Press, 2009).
54. Daniel Hacker, "Reconciling Conflicting Data on Jobs for College Graduates," *Monthly Labor Review*, July 1992, 3-12.
55. Pryor and Schaffer, *Who's Not Working and Why*, p. 62.
56. Vedder, et al., *From Wall Street to Wal-Mart*.
57. The data were compiled by PayScale.com, and are reported (with a larger number of majors) in Philip R.P. Coelho and Tung Liu, "The Returns to College Education," Department of Economics, Ball State University, August 14, 2012.
58. We are not unique in noting those earnings disparities. Perhaps the most cited modern study is Stacy Dale and Alan B. Krueger, "Estimating the Returns to College Selectivity Over the Career Using Administrative Earnings Data," *Quarterly Journal of Economics* 117 (November 2002), 1491-1522. They have also written a paper updating the earlier findings. The paper, with the same title as the earlier one, is Working Paper 1267 of the Industrial Relations Section, Department of Economics, Princeton University, 2011.
59. See Pryor and Schaffer, *Who's Not Working and Why* for a more complete description of the trend up until the mid-1990s.
60. Hernstein and Murray, *The Bell Curve*, p. 445.
61. Barton, "How Many College Graduates Does the U.S. Labor Force Really Need?"
62. Although apprenticeships and other postsecondary options are often lost in the debates over proper public policy in education, to some extent, these options are receiving increased attention. For discussion of apprenticeships, see Diane Auer Jones, "Apprenticeships as an Alternative Route to Skills and Credentials," in *Getting to Graduation: The Complete Agenda in Higher Education*, eds. Andrew P. Kelly and Mark Schneider (The Baltimore: Johns Hopkins University Press, 2012).
63. Arthur Hauptman and Cathy Krop make a similar point with respect to federal student loans (though they look only at enrollment of private colleges and universities). See Hauptman and Krop, *Federal Student Aid and Tuition Growth: Examining the Relationship*, (New York: Council for Aid to Education, 1998), 11-12.
64. Michael Corkery, "Colleges Lose Pricing Power," *Wall Street Journal*, January 9, 2013, accessed at http://online.wsj.com/article/SB10001424127887324442304578231922159602676.html?mod=wsj_hpp_LEFTTopStories , accessed on January 12, 2013. Another story making a similar point is Kevin Kiley, "Priced Out," *Inside Higher Education*, January 11, 2013, accessed at <http://www.insidehighered.com/news/2013/01/13/moodys-report-shows-diminished-pricing-power-college> .
65. Alison Wolf, *Does Education Matter*, p. x.