College For All?
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We acknowledge that not everyone needs to go to college. But everyone needs a postsecondary education. Indeed we have seen ample evidence that access to postsecondary education and training is increasingly vital to an individual's economic security.
—Commission on the Future of Higher Education (2006)

Despite the commission's careful distinction between "postsecondary education and training" and a college education, what we have here, from the conservative side of the aisle, is a fresh national commitment to "college for all," a populist promise to put a bookish chicken in every pot. The belief in "college for all" and its awkward country cousin "postsecondary education and training for all" is here to stay, because it is animated by a uniquely American mix of cultural and political biases that go deeper than political divisions. Public support for "college for all" unifies the aspiring middle class with those who have already arrived but have a fear of falling and a dread of downward mobility for their children.

The American belief in "college for all" arises from deep in our individualistic cultural bias. We welcome an increasing reliance on college as the arbiter of individual career opportunity since, in theory at least, using education to mediate opportunity allows us to expand merit-based success without surrendering individual responsibility. After all, we each have to do our own homework to make the grades and ace the tests that get us into college and in line for the good jobs.

The use of postsecondary education as the gateway to opportunity also complements our other key preferences for an open economy and a limited government. Education, as opposed to job-specific training, is supposed to develop the general metacognitive abilities necessary to keep up with the changing skill requirements of the contemporary workplace, and it thereby provides the economic self-reliance necessary to ward off public dependency and an expanding welfare state.

"College for all" also works as a public narrative, in part because high-school vocational alternatives are widely regarded as second best by the general public, if not by the elites. Even though polls show that most Americans agree that everyone doesn't need to go to college, most of them support alternatives to college for other people's children, but they want college for their own. Ultimately, of course, there are no "other people's children."

The Shifting Economy

But there's more to "college for all" than cultural bias, political positioning, and middle-class angst. The motto also resonates with our recent experience in the economy.

The historical increase in the workplace demand for postsecondary education is obvious in any analysis of the official government data. In 1973, only 28 percent of prime-age workers had any postsecondary education. Today, 59 percent have attended some type of postsecondary institution.

Postsecondary requirements are increasing partly because jobs that require postsecondary education are concentrated in the growth industries. Our increasing reliance on postsecondary education as the arbiter of opportunity is a direct result of the rise of the post-industrial service economy. Most new jobs that require postsecondary preparation are in offices, education, health care, and the high-tech sector—the signature occupations and industries in the "knowledge economy."

The share of white-collar office jobs, for instance, has risen from 30 to 40 percent of all jobs since 1973. In 1973, only 38 percent of office workers had some kind of postsecondary education. Today, 69 percent of them do, while 37 percent have at least a bachelor's degree, making offices one of the most highly educated workplaces in the country.

The health-care and education sectors also continue to grow, as developing and maintaining human capital becomes more important. Since the 1970s, education and health-care jobs have increased from 10 to almost 20 percent of all jobs. The share of these jobs requiring at least some college has increased from fewer than half in the '70s to more than three-quarters today, with more than 52 percent requiring baccalaureate or graduate degrees.

Meanwhile, the share of technology jobs, the core infrastructure in the post-industrial economy, has doubled from roughly 4 to 8 percent of all jobs. In 1973, 63 percent of technology workers had at least some college; now 86 percent do—and more than one-half have at least a bachelor's degree.

At the same time, the share and number of factory workers with high school or less is shrinking, as a result of productivity growth. These jobs have declined from more than 30 percent of all jobs to less than 17 percent. But even so, the share of manufacturing workers who are college educated is rising, as manufacturing goes high-tech and as the value added comes not so much from making things as from designing, financing, and selling them. In 1973, only 12 percent of workers in manufacturing had any college. That proportion has now increased to more than 36 percent.

Natural-resource jobs—including farming, fishing, forestry, and mining—are also in decline, even as their share of workers with college training keeps increasing. These jobs accounted for about 5 percent of all jobs in 1959 but have declined by more than two-thirds and now only account for about 1.5 percent of all jobs. In 1973, two-thirds of these workers were high-school dropouts, but now workers with at least some college hold 31 percent of those jobs.

Low-wage services jobs are a mixed bag of career and transitional jobs. Their share of the total has not grown since Ike was president in the 1950s, at 28 million workers or about one-fifth of the available work opportunities. Many of these employees are young, some are in school, some are in transition to something better, and some are older workers moving towards retirement.

The Wage Premium for College Graduates

The wage premium for college graduates relative to high-school graduates is the most significant signal that the economy is demanding more-educated workers. During the 1960s and 1970s, the combination of a dramatic increase in the number of baby-boom workers with at least some college and "stagflation" caused the postsecondary wage premium to decline: By 1979, prime-age workers with at least some college only earned about 43 percent more than high-school graduates. But after the 1980 recession, the restructuring of the economy from an industrial to post-industrial knowledge economy accelerated dramatically. As a result, the wage premium for workers with postsecondary education skyrocketed throughout the 1980s and 1990s, reaching 73 percent by 1999. The wage advantage of advanced degree-holders over high-school graduates was even higher, topping out at 124 percent.

And these wage advantages held up and improved in spite of a huge increase in the supply of college-educated workers. Since the 1970s, the share of workers with at least some college tripled, and just since the 1990s, the proportion of employees with at least some college increased by 32 percent. Since the 1990s there have been about 18,350,000 net new workers with at least some college, including 10,000,000 with a baccalaureate degree or better. But their wage advantages over high-school-educated workers still almost doubled over the same period. This is remarkable. Usually, as we all learned in Economics 101, when the supply of anything increases, the price goes down.

FIGURE 1. REAL WAGES BY LEVEL OF EDUCATION

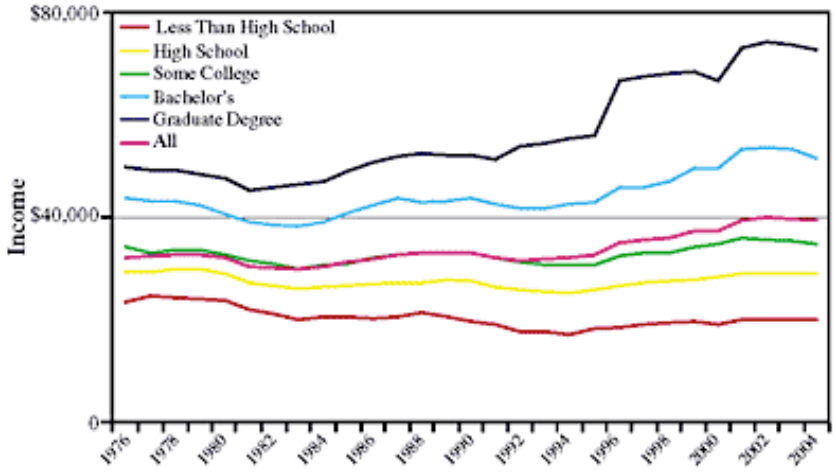


Figure 1 shows the trend in real wages since 1976 for those with less than high school, high school, some college, a baccalaureate degree, and graduate school.

Employers Need Learners

The increase in demand for postsecondary workers results in part from the fact that workers with the most education are likely to be the most effective learners in the high-performance work organizations typical of the new knowledge economy. Training can increase employee productivity by an additional three to 11 percent per annum, and college graduates are almost twice as likely as high-school graduates to receive that training.

The knowledge economy creates powerful synergies between postsecondary education, learning on the job, and technology. Workers with high school or less tend to be hired for jobs equipped with technology that substitutes for skill—for example, the cash register with the pictures of hamburgers and shakes in fast-food outlets. Highly educated workers tend to be hired for jobs that give access to flexible technology that complements their skills—for example, the personal computer. According to analysis by Princeton University economist Alan Krueger, workers with high-school educations who use information technology on the job increase their productivity by about 15 percent, but the productivity premium for college graduates who use information technology is nearly twice as high.

College as Workforce Development

College is also the key to good jobs because it's the only game in town. With no substantial apprenticeship system in the United States, postsecondary education has become our core workforce-development system. High-school vocational programs survive only at the margins of the college-prep curricula, and attempts to build alternatives to college have failed. Beginning in the Œ60s we tried a "second chance" education and job-training system but learned that it is the first chance at postsecondary education that really counts. The Clinton Administration's high-school-to-work apprenticeship programs never got any real traction and were eventually abandoned after they were snubbed by high-school students. U.S. Department of Labor funding for training programs has fallen from a hefty $27 billion (in 2004 dollars) at the end of the Carter Administration to a measly $3 billion under President Bush.

Postsecondary education has become our workforce-development system, in part because it has taken on a strong occupational and professional profile. Postsecondary degrees and curricula have co-evolved with

occupational demand. Nowadays, most college students sidestep the traditional majors in favor of postsecondary curricula with a stronger career focus.

Apparently, while vocational preparation is an unpopular alternative in high school, it's quite acceptable as long as we call it college. Of the 1,399,542 baccalaureate degrees conferred in 2004, 42,106 were conferred in the liberal arts and sciences, general studies, and humanities, including13,327 in math. But 307,149 were granted in business; 22,164 in parks, recreation, leisure, and fitness studies; 70,968 in communications; and 77,181 in the visual and performing arts. In addition, virtually all graduate and professional degrees come with an occupational or industry focus. We see the same pattern in the expansion in applied associate's degrees, certificates, certifications, and customized training. Of the 665,301 associate's degrees conferred in 2004, only about a third (227,650) were conferred in the liberal arts and sciences, general studies, and humanities, including only 801 in mathematics.

The Historical Picture

If anything, the official data understate the importance of postsecondary education and training, because they only offer snapshots of current demand and ignore the long revolution in human-capital development that has been characterized by a steady increase in the educational requirements for work. At any given time, most occupations have a variety of incumbents with different levels of education. But the clear trend is toward workers with greater postsecondary attainment, with higher wages going to those with the most postsecondary education or training.

In recent decades, the largest share (about 70 percent) of the increase in postsecondary requirements has come from "upskilling." For example, what we called foreman and manufacturing supervisor in the 1960s morphed into a variety of new occupations requiring postsecondary education, including the modern manufacturing engineer. A significant but smaller share (about 28 percent) has resulted from the expansion and diversification of occupations in which all or the majority of incumbents already had postsecondary education. What we called a medical doctor in the 1950s has evolved into a host of new medical occupations with a complex set of college-level skill requirements. Middle managers divided into a myriad of occupations in what are now called business services.

Counting Jobs

There are a variety of other reasons why a static reading of the official data tends to understate postsecondary demand:

- First, all jobs are not equal. Those that require postsecondary education are more likely to be career jobs, while those that require high school or less are more likely to be transitional jobs at the beginning or end of careers. There are many more brain surgeons who used to be dishwashers than there are dishwashers who used to be brain surgeons, but the statisticians tend to treat the two jobs equally.
- Second, the official data overstate non-college jobs by not controlling for age effects. By including workers between 16 and 30 years old, the official data include many youths who are working but have not completed their postsecondary education or training. Similarly, including workers over 55, especially men, adds jobs in which the workers may be transitioning from career jobs that required postsecondary learning into retirement.
- Third, the data on postsecondary education and occupational requirements exclude non-degreed postsecondary education and training. About 8 percent (12 million) of American workers get between one and five years of formal job training or apprenticeship. About 6 percent (roughly nine million workers) get postsecondary vocational certificates or test-based certifications rather than degrees.
- Fourth, jobs that require high school or less make up an artificially large share of job openings because they have much higher turnover than those that require postsecondary education and

training. There are more job openings for dishwashers than brain surgeons because dishwashing jobs turn over faster than brain-surgeon jobs.

If we correct current estimates of demand for workers by allowing for these factors, the importance of postsecondary education in career jobs becomes much more apparent than it appears initially in the static snapshots presented in official data. In 2002 the actual number of non-college jobs was 61 million or about 44 percent of all jobs, leaving 56 percent of jobs that required at least some college. But if we correct for the number of youths still in school, the 12 million workers who get one to five years of non-degree postsecondary training and apprenticeship, and the nine million workers who get certificates, the share of jobs that require at least some formal postsecondary education or training jumps to 74 percent.

To some extent, the understatement of the demand for postsecondary education results from classic bureaucratic fragmentation. The Department of Labor is interested in occupational data, and the Department of Education is interested in education data. The common interest in the relationships between the two falls between the cracks.

The U.S. Labor Department assigns current educational requirements to occupations by choosing the predominant educational credential among the incumbents. The rule in deciding the predominant educational qualification is to ignore groups of incumbents in the occupation who represent less than 20 percent of the total. For example, suppose Occupation X includes 19 percent with graduate degrees, 19 percent with bachelor's degrees, 21 percent with associate's degrees, 21 percent with some college but no degree, and 19 percent with high school or less. That occupation would be counted as not requiring a bachelor's degree, even though 38 percent of the incumbents have one and the highest earnings in the occupation accrue to those with baccalaureate or graduate education.

Another problem stems from the fact that the U.S. Bureau of Labor Statistics (BLS) projects occupational growth but holds education constant in its projections. Naturally, when education credentials are held constant, the projections don't grow very much. Consequently, growth in postsecondary requirements using official data reflects only occupational shifts and ignores increases in postsecondary requirements that occur within occupational categories.

Thus, if used without proper adjustments, the BLS methodology can lead to a gross underestimate of both current and future postsecondary-education requirements in the labor market. Unfortunately, these errors cascade down through official state and local data, because all states and local authorities use the BLS model and none of them, as far as I know, corrects for educational growth in occupational requirements. But if properly adjusted, the official data show robust growth in the demand for postsecondary education.

TABLE 1. DIFFERENCES BETWEEN OFFICIAL PROJECTIONS OF JOBS IN 2012 AND PROJECTIONS ASSUMING HISTORIC RATES OF UPSKILLING IN EDUCATIONAL CREDENTIALS

	Column 1 Actual Jobs and Education Levels in 2002	Column 2 Official Projection of Jobs in 2012 Holding Educational Attainment Constant by Occupation	Column 3 Difference Between 2002 Actual Jobs and 2012 Official Projections (Column 2 Minus Column 1)	Column 4 Projections of Job Increases or Decreases to 2012 Based on Historical Increases in Postsecondary Education Requirements	Column 5 Difference in Number of Jobs Between 2002 and Projected 2012 (Column 4 Minus Column 1)	Column 6 Difference Between Corrected and Official Projections (Column 4 Minus Column 2)
Less-than-high-school jobs	16,482,666	18,069,367	+1,586,701	12,068,287	- 4,414,379	- 6,001,080
Jobs that require high school	44,698,388	51,612,592	+6,914,204	50,256,976	+ 5,558,579	-1,355,616
Jobs that require some college	27,559,941	30,187,249	+2,627,308	28,930,825	+1,370,884	-1,256,424
Associate's degree	12,327,598	16,912,134	+4,584,536	15,044,029	+2,716,431	-1,868,105
Bachelor's degree	26,406,079	33,295,247	+6,889,168	36,204,861	+9,798,782	+2,909,614
Graduate degree	12,809,023	15,225,880	+2,416,857	22,979,341	+10,170,318	+7,753,461
Total civilian jobs	140,286,000	165,302,000	+25,018,774	165,483,000	+25,200,615	

Source: Author's Computations Using Bureau of Labor Statistics and Census Data

Columns 1 and 2 in Table 1 above show actual jobs in 2002 and the increase in jobs projected to 2012 using the official occupational projections released by the BLS, with column 3 showing the projected gain based on holding postsecondary requirements within occupations constant at the 2002 level. The data in columns 4 and 5 are derived from projections that Jeffrey Strohl and I did for the U.S. Senate, which incorporate an estimate of occupational "upskilling" in the projections model. We based our projection of postsecondary upskilling on a relatively simple and conservative regression model produced by an analysis of actual changes in postsecondary attainment by occupation and industry between 1992 and 2004.

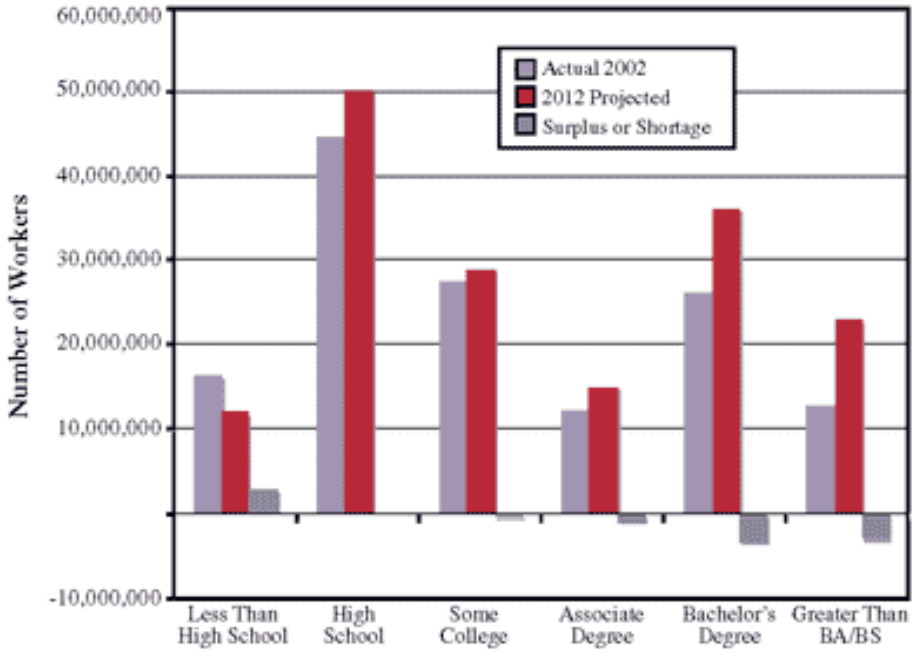
The effect of our projections with upskilling incorporated into the model is to ratchet postsecondary requirements substantially upward, increasing the share of jobs requiring postsecondary education to about 63 percent. Both sets of projections show an increase in postsecondary jobs. But the projections that account for postsecondary upskilling show a stronger increase, and the increases are weighted much more heavily toward baccalaureate and graduate degrees. Taking into account the upskilling that is likely to occur, labor-market projections suggest an increase of almost 20 million jobs that require bachelor's degrees or better (Column 4 minus Column 1). This projection suggests an increase in jobs requiring BA and graduate degrees that is more than twice the increase in the official projections that hold upskilling constant—a difference of 10,663,075 jobs (Column 5 minus Column 3).

Supply of Human Capital

Will we produce enough college-level workers to meet demand in the future? After developing these estimates of postsecondary demand that assume a continuation of the historical trend in postsecondary upskilling, Strohl and I also tried to get a sense of educational supply in order to see if shortages or surpluses would be likely to occur.

As you can see in Figure 2 below, we found likely surpluses of high-school dropouts relative to the jobs available. The supply and demand for high-school-educated workers looked relatively balanced. But we found increasing shortages of college-educated labor as we moved up the attainment hierarchy.

FIGURE 2. SHORTAGES AND SURPLUSES OF WORKERS BY EDUCATIONAL ATTAINMENT, 2002 AND 2012



Source: Anthony P. Carnevale and Jeffery Strohl. Authors' Analysis of Current Population Survey and Bureau of Labor Statistics Data

Will shortages of college-level workers actually occur? The only honest answer is: It all depends. Competition for postsecondary workers could increase wages enough to accelerate postsecondary enrollment and persistence, preventing shortages. Since 1979 we've added more than 30 million college-educated job seekers to the workforce, and postsecondary earnings keep going up.

Meanwhile, since the 1980's automation has eliminated jobs that only require high school and has increased demand for workers with postsecondary attainments, and it will continue to do the same in the future. To keep up with employers' demands for higher-skilled workers, we could move toward skill-based immigration, but Congress is unlikely to allow any substantial increases over the current 85,000 H-1B skill-based visas. We could delay retirement for baby boomers, but political opposition would be significant and the impact marginal. Delaying Social Security and Medicare, for example, would postpone retirement primarily among low-skill, low-wage workers who are dependent on public benefits.

A significant number of postsecondary jobs could be off-shored. Since 2000, almost 70 percent of off-shored jobs have required at least some college, which means that anywhere from six to 15 million jobs requiring postsecondary education are theoretically vulnerable. But at present only three million postsecondary workers outside the U.S. have enough English-speaking skill to take jobs away from American college graduates. Besides, in an economy that creates and destroys almost 10 million jobs a month and that will grow from 146 million jobs in 2007 to about 170 million in 2014, the off-shoring threat is less intimidating than it seems at first blush.

The threat of globalization to American jobs, especially college-level jobs, is overblown. The economic world is not flat. Workers with postsecondary degrees don't really compete head to head with college-educated workers overseas. Economic activity tends to have the same kind of rough and irregular topography as the physical world: It occurs in geographic clusters of infrastructure and financial and

human capital—usually with postsecondary education and university R&D resources close to the geographic core of each growth cluster.

This clustering phenomenon is very persistent locally, regionally, nationally, and globally, whether you map Starbucks or software production. American competitiveness derives from our world-class agglomerations of human capital, technological innovation, and complementary infrastructure—Silicon Valley and Hollywood, for example.

We may not always be the biggest economy, but we will probably be the richest over the foreseeable future. The United States became the world's biggest economy when we surpassed China in the latter half of the 19th century. Eventually China will probably take back the lead. But America includes most of the world's most powerful economic clusters, and global growth will create new markets for them. As long as we increase our human, financial, and technological capacity, we will benefit from that growth.

Currently, the six largest economies are the United States first, then Japan, the United Kingdom, Germany, France, and Italy. By 2050, most analysts agree that the new ranking in terms of overall gross domestic product is likely to be China, the United States, India, Japan, Russia, Brazil, the United Kingdom, Germany, France, and Italy. Ultimately the United States won't be the biggest economy, but it will still be the richest, with the highest demand for human capital (See Table 2).

TABLE 2. NATIONAL RANKINGS IN GROSS DOMESTIC PRODUCT AND GROSS DOMESTIC PRODUCT PER CAPITA 2007 AND 2050

National Ranking By Total GDP 2007	National Ranking By Total GDP 2050	Ranking GDP PER CAPITA 2050	Projected GDP PER CAPITA 2050
United States	China	United States	$84,000
Japan	United States	Japan	$67,000
United Kingdom	India	United Kingdom	$59,000
Germany	Japan	Germany	$51,000
France	Russia	France	$49,000
Italy	Brazil	Italy	$40,000
China	United Kingdom	Russia	$39,000
India	Germany	China	$32,000
Russia	France	Brazil	$26,592
Brazil	Italy	India	$17,000

Source: Author's Analysis of Data from the McKinsey Global Institute

Thus, even by 2050, the rankings in wealth per capita are likely to look pretty much the same as they do now.

Our panic over globalization is overstated for other reasons. The notion that our employers will continue to get their labor either offshore or through immigration ignores the fact that nations such as Brazil, Russia, India, and China will need a lot more postsecondary workers if they are going to expand their own economies.

In the United States, about seven million scientific and engineering personnel with a baccalaureate degree or better are needed to run different parts of our infrastructure—about two percent of our population. If it takes roughly two percent of a population to perform these functions at the U.S. level of development, then our 6.6 billon-person world needs about 150 million of them. It is currently about 100 million workers short. And that's just bachelor's-level technical personnel. What about school teachers, managers, and all the other postsecondary workers required to keep a modern society going? The nations of the

world are a long way from meeting the global demand for skilled labor, and the demands of American employers are just a drop in the bucket.

Over the foreseeable future in the United States, the demand for postsecondary workers will most likely stay high. But beneath the national aggregates, labor markets for college workers are likely to be a geographic, sectoral, and occupational crazy quilt of surpluses and shortages. The closest to a sure thing, however, is that the relentless revolution in global human-capital development virtually guarantees huge global shortages in postsecondary labor in the not-too-distant future, especially in nations like China, India, Russia, and Brazil.

Education or Training?

Many educators worry that with the economic value of education increasing, it may become too much like job training. They make an important point. The temptation to provide narrow vocational training rather than more general learning is strong in a market economy.

But there are reasons for optimism. If the growing attention to education and careers results in narrow occupational training, that would be bad economics. The economic value of general competencies exceeds and is growing faster than job-specific competencies. That is why managers and professionals make more than technicians, even in high-tech firms. While specific occupational skills have greater short-term economic value, more-general skills have greater long-term value. General competency leavens all subsequent learning and practical experience.

As the economic value of education increases, we will also need to remember that education, especially higher education, is about more than dollars and cents. It should do more than provide new technology and foot soldiers for the American economy. Educators in both secondary and postsecondary institutions have cultural and political missions to ensure that we have an educated citizenry that can continue to defend and promote our democratic ideals.

And of course education has intrinsic as well as extrinsic value. The urge to learn is innately human. A wealthier world will be able to afford more learning for its own sake, as well as require more learning for practical purposes. We need to aspire to a dual bottom line in American higher education, strike a pragmatic balance between education's growing economic role and its traditional cultural and political independence from economic forces.

My own bias is that we should worry less about how much postsecondary education and training we provide and more about who gets the education and who gets the training. Access to selective liberal education is still the surest pathway to the most lucrative and prestigious graduate degrees and professions, and the highest economic returns go to graduates with the richest mix of the most selective general and specific education. A liberal-arts degree topped off with a graduate or professional degree still brings the highest returns in earnings, especially when both degrees come from the most-selective postsecondary institutions. So we need to be concerned about the fact that such education consistently goes to the students with the richest parents.

But ultimately, the economic role of postsecondary education, especially its role in preparing American youths for work, remains crucial. We wouldn't be talking about "college for all" without it. The inescapable reality is that ours is a society based on work. Those who are not equipped with the knowledge and skills necessary to get and keep good jobs are denied full social inclusion and tend to drop out of the mainstream culture, polity, and economy. In the worst cases, they are drawn into cultures, political movements, and economic activities that are a threat to mainstream American life.

So if secondary and postsecondary educators cannot fulfill their mission to help expand the economy and help young people and adults to become successful workers, they will fail as well in their cultural and political missions to create good neighbors and good citizens. Increasing the pragmatic relevance of education should extend educators' ability to empower Americans to do work of the world, rather than to retreat from it.

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