How Much Higher Education Does the Nation Need?

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I know no safe depository of the ultimate powers of the society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion by education.


Laws for the liberal education of youth, especially for the lower classes of people, are so extremely wise and useful that to a humane and generous mind, no expense for this purpose would be thought extravagant. -John Adams

In this chapter we seek to provide a working answer to the question posed in its title. For the reasons explained initially in chapter one, we believe that the nation needs substantially more college-educated people than it is on track to produce given current trends and policies. In this chapter, first, we assess the difference between societal need for educated people and market demand for them, concluding that, while projected market demand is a logical lower bound estimate of societal needs, needs can emerge and/or be newly articulated in the policymaking process that would not be projected using standard assumptions.\(^1\) We make the case that, over the relevant planning horizon, such needs for educated people are more likely to exceed trend-based projections than to undershoot them.

Indeed, we next explore the limits of precise “manpower forecasting” of demand and supply, which has not proved very successful in the past and seems unlikely to be any more accurate now given the rapidity of change—much of it change that cannot realistically be foreseen with precision far in advance—in economies and societies today.

\(^1\) For example, needs for medical researchers to tackle treatments for newly discovered diseases or increased needs for environmental technologists that might be stimulated by newly enacted legislation responding to emerging environmental crises. Such shifts are not strictly predictable by standard forecasting techniques but may be quite important to societal well-being.
Then, we delve into some of the key evidence and analytic issues on both the demand and supply sides of this need-for-higher-education question a bit more, paying particular attention to the relevant economic frameworks and evidence, especially trends in labor market demand for educated people as reflected in their market earnings. In our view, the evidence and arguments point clearly toward the need for and benefits of strong, steady gains in the output of degreed graduates but with due attention to market signals that could conceivably show a given growth pace to be too fast. In fact though we think that the risks are mostly in the other direction, i.e., that market signals will–save perhaps for occasional periods of cyclical economic downturn–generally show that we could profitably invest more in higher education than the resources we can comfortably muster. This will eventually lead us, later in the book, to make suggestions for altering priorities via both direct persuasion and, more powerfully, through the incentives and institutional arrangements that set or influence them.

NEED AND DEMAND

Labor market demands–reflected in job openings and earnings trends–provide convenient and theoretically accepted benchmark indicators of societal needs for those with particular credentials and skills at a given point in time. If job openings are plentiful, unemployment low, job search times short and salaries rising in relation to those of others in the labor market, then demand for holders of a particular credential, say a bachelor’s degree in computer science, is strong relative to the current supply. The general implication is that these indicators signal, through the operation of markets based upon individual and collective choices, society’s need for an increased supply of such degree-holders. If good labor market information is available and absent impediments to students enrolling and completing appropriate study programs (such as capacity constraints), the supply side of the market should respond to the positive signals by producing more of the graduates who are in demand. If such impediments are present then public policies should be enacted to remove them, assuming the demand is not judged evanescent.
On the other hand if the indicators suggest that demand is weak in a field, say, perhaps in some social service professions or for PhDs in the humanities where salaries are relatively low and some degree recipients are unable to find ostensibly relevant employment, the general implication from economic theory is that no increased supply is needed by society, or even that fewer new graduates might be appropriate. But here the theory may fall short because its normative assumption is that the current level of market demand is the “right” level for society. The market reflects the traditional patterns in the demand for social workers and humanities scholars but, since most of such demand in these instances is supported by public funds in one form or another, the society could and perhaps should decide that it would be better off with more of the services provided by such professionals. Since this is ultimately a philosophical and political (in the best sense) argument, some would be able to make a plausible case that societal needs for more social workers are great and that agency employment and salaries should reflect this. If such policies were enacted, need and demand would presumably come into harmony but, short of that, societal needs could be said by reasonable people to exceed market demands. Many would make such claims today in fields such as math and science teaching (where salaries are too low to elicit sufficient supplies in a competitive market for such skills) and the provision of some human services to the needy.

The emergence of the fast-moving, technology-driven, knowledge economy and society suggests another dynamic is increasingly at work today and will be in the future. The evidence suggests that in circumstances where the supply of well-educated people exceeds market demand for them in traditional types of employment slots for a time, the educated find creative ways to employ themselves that often turn out to be productive for the society and economy in the long run. Thus, in a recession or after an episode of corporate downsizing, some of those with college degrees or more may well become self-employed as consultants or entrepreneurs (Brown, Hamilton and Medoff, 1990; Collins, 2004; Hopkins, 2004). Although it certainly involves some dislocations, discomfort and often reduced earnings, this is one potentially viable way that educated people wait out

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2 Note also that the degree holders could find work in other fields that they did not expect to enter but in which they are productive and well rewarded, suggesting simply that “relevant” employment may often be too narrowly conceived.

3 This pattern is sometimes referred to as, “Supply creates its own demand.”
slack periods in the economy. More generally, the educated have advantages over others in finding decent-paying “piecwork” in consulting and similar arrangements and are generally more successful as entrepreneurs (Van Praag and Cramer, 2001). Given the increased pattern of white collar layoffs related to corporate restructuring (Osterman, 1999) and the multitude of niche markets constantly being created today by technological changes, marketing efforts and the global reach of information and communications technology, such opportunities will almost certainly grow in the future for those who are well prepared to take advantage of them. The better-educated are, in general, the better prepared.

Moreover, since the educated are more likely to seek additional education and to benefit readily from it (Livingstone, 1999), other educated people who are laid off are likely to seek to alter their skill sets to better match the employment market by seeking additional training or education in fields in greater relative demand. Failing either of these approaches, we know that more educated workers tend to be more willing to move geographically for better job opportunities which also helps to reduce imbalances. Finally, were excess supply to last for a lengthy period, there is good evidence that students would adjust their enrollment patterns to reduce production of the “unwanted” degrees (Freeman, 1971). Economic theory and evidence clearly show that labor market imbalances, both “surpluses” and “shortages” of workers in relation to jobs that presumably call for their qualifications, are short-lived as long as market forces are allowed to work to clear them.

There is a theoretical downside, however, to plentiful supplies of advanced degree holders relative to traditional sources of demand. With plentiful supplies of, say, college degree-holders available for employment in jobs formerly employing high school graduates, some employers may opt for the college-degreed individuals even if the degree is not “needed” for the job while displacing the unfortunates whose educational credentials are no longer competitive. Some would call this “credential inflation” and its prevalence has been documented in conditions of a slack economy (Collins, 1979; Thurow, 1980). If the higher level of education were indeed superfluous this would represent a waste of society’s resources. Yet, one wonders why employers would make such choices—probably at the cost to them of somewhat higher wages at least in the
longer run—if they found the additional credentials to be of no value in the workplace. Rather, they are probably paying for the *signal* that advanced educational credentials provide about applicants’ motivation and/or abilities and are pleased to have the opportunity to take advantage of this information.

Most studies show that college graduates’ earnings trajectories are steeper over time than those with less education working in the same job (Cohn and Geske, 1990), which suggests that, unless employers are profligate or unobservant enough to reward employees without regard to their productivity over time, they are responding (mostly) rationally when they favor the more educated in hiring. Again, apparent excess supply of the well educated tends to create new sources of demand for them and it seems illogical to conclude that this is unproductive if employers do not find it so.\(^4\) Of course, displaced workers with now-uncompetitive credentials are disadvantaged and may need assistance, but it seems that more education is part of the solution here too.

**EVIDENCE ABOUT RECENT TRENDS IN RETURNS TO INVESTMENTS IN HIGHER EDUCATION**

The evidence now makes it abundantly clear that what economists call the *rate of return* to higher education has been growing in recent years. This is suggested first by the fact that the annual earnings advantage for bachelor’s degree graduates aged 25-34 compared to high school graduates in the same age range has climbed from 34 percent for women and 19 percent for men in 1980 to 71 percent for women and 67 percent for men in 2006 (U.S. National Center for Education Statistics, 2008).\(^5\) Furthermore, those with

\(^4\) It is possible that whatever benefits additional education brings in such cases are not sufficient to offset the costs of providing this level of education. But, we think this should not be assessed statically, as is usually done, but rather only after the long run effects of having more educated workers in jobs that did not formerly require their credentials can be evaluated. In general, the historical evidence from the U.S. economy’s successful use of increasingly educated labor over time to innovate and enhance productivity suggests strongly that the payoffs exceed the costs (Denison, 1985; Marshall and Tucker, 1992).

\(^5\) The discussion in this section focuses on trends in the *private* rate of return to investment in higher education: that which accrues to individuals through their labor market earnings and other benefits to them. Later in the chapter we broaden the
master’s degrees earn about 19 percent more than graduates with only a bachelor’s and those with a graduate-level professional degree earn 85 percent more than those with a bachelor’s degree. According to standard economic theory, earnings from work generally represent a good approximation of the relative value to the economy of the skills, or *human capital*, embodied in persons with these different levels of education (Cohn and Geske, 1990). And, of course, students and parents are well aware of the association between college degree attainment and other aspects of desirable careers, such as job-related benefits, satisfaction and social status, as well as with aspects not directly related to employment such as longer life, better health, better child-rearing outcomes, and generally lower rates of social dysfunction (Baum, 2007). Indeed, public opinion evidence makes clear that the majority of respondents in the general public believe higher education is a necessary investment for most young people today (Immerwahr and Johnson, 2007).

Econometric studies that take into account the effects of other variables likely to be correlated with both education and earnings (or, occasionally, other outcomes) indicate that as much as 90 percent of the difference in earnings between those with more compared to less education is likely accounted for by education alone (Card, 2001, cited in Psacharopoulos and Patrinos, 2004). Economists have also concluded that, once costs are fully taken into account, investments in *human capital* via higher education are generally good economic investments with a rate of return at least comparable to that for physical capital investments such as in industrial machines, public infrastructure and the like. Pschacaropoulos and Patrinos (2004) updated a series of earlier studies and reviews of the economic literature on returns to investment in education. They estimate private returns to higher education investment across 98 countries at around 19% annually and “social” returns, which take into account public costs but generally not societal benefits other than earnings and taxes paid, at around 11% (114). Estimates for OECD countries are lower but still strong—11.6% for private returns and 8.5% for social returns. The latest perspective to take account of public or *social* benefits that also accrue to higher education investments.
study reported for the U.S. showed returns to investment in higher education of 12% (Psacharopoulos, 1994, cited in Psacharopoulos and Patrinos, 2004, 125). Also for the U.S., Psacharopoulos and Patrinos cite a number studies using identical twins to identify the unique effect of education on earnings, net of many family background and even genetic factors. These consistently find earnings gains of around 10% for an additional year of schooling (116). Finally, these authors report a positive trend over time in earnings returns from an additional year of schooling in the U.S. across studies using a comparable methodology—from 7.5% in 1976 (Kling, 1999) to 10.0% for the 1991-95 period (Psacharopoulos, 2000).

As outlined in chapter one, the current era—the knowledge society era with its sharply increased dependence on pervasive information and communications technology that changes rapidly and allows smart firms to respond rapidly to changes in tastes and markets and where globalization makes environmental challenges more ominous and intercultural understanding more important—is almost certainly one where advanced education will continue to grow in importance and therefore in economic and social return.

Growing “Wage Premiums” for Education and Growing Inequality

Figures 2-1 and 2-2 depict the trends over the past several decades in average, inflation-adjusted incomes for males and females with different levels of education. Clearly, as the economy has restructured in response to new technology and global competition, college graduates, particularly female college graduates, have been doing considerably better than those with less education in spite of general increases in numbers of the former in the labor force mix. Most striking are the relative gains in real incomes of those with graduate and professional degrees (law, medicine, etc.) to which the bachelor’s degree provides the gateway. The stronger link between education and

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6 The data used in this study are dated though, covering the year 1987.
7 These are not, strictly speaking, return-on-investment studies but rather estimate the earnings effect of an additional year of schooling.
8 America’s competitor nations clearly perceive the value of increasing the level of education in their populations. Recall the large recent gains in the collegiate attainment rates of many OECD nations referred to in the previous chapter and depicted in Wagner (2006).
income has much to do with the growing inequality of incomes in the U.S. (and elsewhere). In addition to lower growth rates for all income groups except the top 5 percent, the increasing gap between growth rates in real incomes among those in the upper parts of the income distribution and those in the lower parts, a gap that was not evident in the postwar period up to 1973, the date usually associated with the onset in earnest of economic restructuring. In addition, the very sluggish recent income growth rates of those in the lower income groups are apparent, groups that are heavily populated by individuals without college degrees. 

Unfortunately, educational attainment has been increasing much more rapidly at the upper end of the income distribution than at the middle and lower ends (Figure 2-4). According to these estimates by Thomas Mortenson, the gain in the bachelor’s degree attainment rate by age 24 between 1977-79 and 2003-05 has been nearly 40 percentage points for the top income quartile but just 4 points for the bottom quartile, with the second and third quartiles gaining 5.7 points and 9.9 points, respectively (2006, 3). Also, Figure 2-5 shows that there are large and growing differences in rates of completion of four or more years of college by ethnic group. As of 2006, 34.3% of non-Hispanic whites aged 25 to 29 had four or more years of college as against 18.6% of blacks and just 9.5% of Hispanics (Mortenson, 2007, 13). Attainment rates for young blacks have been increasing since around 1990, although less steeply than those of whites, while rates for Hispanics have changed little for 25 years.

A newly published study of economic mobility by the Brookings Institution finds that education has been strongly related to such mobility as measured by comparing incomes and relative standing in income of adults at around age 40 in the period 1995-2002 to that of their parents at about the same age in 1967-1971 (Haskins, 2008, 3-5, 9). One factor is that differences in individual earnings by education level tend to be magnified in family incomes by the tendency of family members to have similar educational backgrounds. Economists call this affinity among spouses “ assortative mating.”

Of course, differences in education are not the only factor at work here. Other analysts have pointed to the role of declining unionization, the decreasing real value of the minimum wage, increased immigration of less-skilled workers, and less progressive taxation as additional influences (Mishel and Rothstein, 2007).

These changes are calculated as 3-year averages to smooth out single year fluctuations. The values in Figure 2-4 are single year figures.

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citing data from Panel Study of Income Dynamics). For children whose parents were in any of the five income quintiles in the earlier period, the chances of moving up (or staying at the top) were much greater for those attaining a college degree than for those who did not. Of particular note, without a college degree 45% of those starting in the bottom quintile of (parental) family income remained there at age 40 but only 16% of those with a college degree were so mired (ibid, 5). Indeed, 41% of those starting at the bottom but attaining a college degree had made it into one of the top two income quintiles at age 40 but only 14% of their cohorts without a college degree had done so. For those from the second lowest parental family income cohort, 47% of those with a college degree had reached one of the top two income cohorts at age 40 compared to just 23% of those without a degree (ibid.).

It is, of course, hardly surprising that higher education is a key factor in achieving the American dream of intergenerational social and economic mobility. This empirical data serves to highlight the problem of continued inequities in access to higher education opportunities. Figure 2-5 showed the gaps in college attainment by ethnic group. Figure 2-6 shows the differences in 2005 by parents’ income quintile. Baccalaureate attainment rates of adult children decrease steadily from 53% among children of those who began in the top income quintile down to 20% among those from the second lowest quintile to just 11% for those in the bottom quintile (ibid., 6). Clearly, a society with aspirations to social equity needs to work to sharply decrease these gaps. Equally importantly, if we are to produce more college educated people overall in an era when a sharply growing share of young people will come from minority ethnic groups and families of modest means, our public and educational policies must be designed to improve performance in preparing them for college and helping them succeed in it.

TRENDS IN JOBS CALLING FOR HIGH LEVELS OF EDUCATION

Recent decades have seen steady increases in the proportions of jobs held by individuals with college degrees. Table 2-1 provides data for the most recent period for which the Department of Labor’s Bureau of Labor Statistics has data for comparable occupational categories, 1999-2007. The largest growth in both number of jobs and
growth rate over this 8-year period (15%) was in the “professional and related occupations” category, which contains the largest proportion of baccalaureate and advanced degree-holders. The other category containing many college graduates, management, business and financial occupations, actually lost jobs overall for this period reflecting the downturn in the economy just after the turn of the century that affected business hiring. The years 2003-2007 show a considerable recovery, however, following substantial losses earlier. Note that service occupations, which employ a relatively low proportion of college graduates, grew almost as much and almost as fast (14.6%) as the professional occupations category. Both sales and construction occupations, with only modest but growing proportions of college educated workers, also grew faster than overall employment but their numerical gains in jobs were far less than occurred in the professional and services categories. Meanwhile, “production occupations” (i.e., manufacturing) lost a staggering 19.6% of its 1999 employment by 2007 and saw little bounceback once the 2000-03 downturn ended. There was below average growth in the other major categories requiring generally modest levels of education–office and administrative support occupations and installation and maintenance occupations each gained less than 5 percent–while farming, fishing and forestry jobs declined by more than 3 percent. These figures clearly reflect the disparate trends in the labor market tending to favor the well educated as well as service occupations requiring little formal education.

The Bureau of Labor Statistics not only studies past trends in the U.S. labor market, it also projects future trends. Projections of employment for the decade ahead are published biennially. The latest projections were published in late 2007 and cover the period from 2006 to 2016 (Franklin, 2007, 4). These projections are derived from underlying projections of growth in aggregate economic output\textsuperscript{12} and of particular industries and sectors on which estimates of the demand for labor in more than 700 detailed occupational categories in turn are based. Of course these projections are built on numerous informed assumptions about factors affecting various industries and largely on past relationships among variables, and they make no attempt to forecast cyclical peaks.

\textsuperscript{12} Aggregate economic growth is expected to slow somewhat to an annual rate of 2.8 percent, compared to 3.1 percent over 1996-2006 and 2.9 percent in the decade prior to that (Franklin, 2007, Table 1).
and valleys, so they may be well off the mark in any given future year. BLS has an ongoing program to better understand the economy and improve its methodology but some limitations in forecasting the future accurately are inevitable (Franklin, 2007).

Of particular relevance here, BLS also studies the mix of educational credentials held by incumbents in each occupational category. It classifies occupations by predominant educational credentials according to recent Census data. There are 11 categories ranging from “short term on-the-job training” through “postsecondary vocational award” up to “doctoral degree” and “first professional degree” (Dohm and Shniper, 2007, 104). In the BLS projections of numbers with particular credentials that are expected to be employed in the future, shifts in the mix of occupations in the economy are carefully estimated but, importantly, shifts in the typical credentials held by employees within job categories are not taken into account.

According to the BLS’s latest data on trends in the occupational mix of jobs, those in “professional and related occupations” have been growing at or near the most rapid rate of any broad occupational category over recent decades and this is expected to continue in the decade from 2006-2016 (Dohm and Shniper, 2007, 88). This category is projected by BLS to add nearly 5 million jobs over the decade (+16.7 percent), which is close to one-third (32%), of the 15.6 million total net jobs the economy is expected to gain (Table 2-2). This category includes a large share of jobs typically occupied by workers with higher education credentials such as “health care practitioners and technical

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13 See Alpert and Auyer (2003) and Stekler and Thomas (2005) for assessments of the “accuracy” of the BLS employment projections, focusing mostly on the projections for the 1988-2000 period. The major conclusions from these and earlier such evaluations are that, while the BLS generally gets the general direction of employment changes right—the Spearman rank correlation coefficient between projected and actual growth for 338 occupations that could be compared over 1988-2000 was .43—there are substantial projection errors in many categories, averaging in the 20-25% range over many evaluations. The projections also tend to be conservative, underestimating job growth in more occupations than are overestimated and underestimating large changes on both the growth and decline sides. (This last is not surprising since impacts of dramatic technological and structural changes are inherently hard to predict.) Also pertinent here, the BLS 1988-2000 projections of growth in what was then called the “professional specialty” category (close to what is now called “professional and related occupations”) was underestimated by the largest absolute amount among the major occupational categories—by 2.29 million jobs, or 11.2% of the actual 2000 employment level (Alpert and Auyer, 2003, 13-14).
occupations,“ a category expected to gain 1.423 million jobs or nearly 20 percent;\(^\text{14}\) “education, training and library” occupations expected to gain 1.265 million jobs (14 percent); “computer and mathematical science” occupations (up 822,000 or 25 percent); and so on (see Table 2-3).

A second broad occupational category with a large share of jobs calling for college degrees and more that is expected to experience substantial growth over 2006-16 is “management, business and financial occupations,” which is expected to add nearly 1.6 million jobs (Table 2-2). Its 10.4 percent growth rate is identical to that expected for total employment but this is still the third highest growth rate among the ten “major occupational groups” into which the BLS divides all employment (those shown in Table 2-2). To be sure, “service occupations,” which contains a high proportion of low-paying jobs that do not call for extensive education, will also grow at the same 16.7 percent rate as “professional and related occupations” and is projected to add almost as many jobs (4.83 million), in part to serve the needs of aging “baby boomers.” Among the other broad categories, in general those with projected job losses (production occupations and farming, forestry and fishing occupations) and smaller numerical job gains tend to have low densities of college graduates while there tend to be higher densities of them in the office/administrative support and sales and related occupations categories where projected job gains are third and fifth largest among the broad categories.

Taking all the shifts in the occupational mix (the numbers of jobs in each category) that are projected and the current levels of education that dominate in each occupation, BLS forecasts the numbers of employed individuals at each level of education in 2016. These results are shown in Table 2-4. As can be seen, the largest percentage growth rates in employment (data column 6) are expected to be in those holding doctoral (+21.6 percent) and master’s degrees (+18.9 percent), closely followed by associate’s degrees (+18.7 percent) and then bachelor’s degrees (+16.5 percent), first professional degrees (+14.0 percent), and “postsecondary vocational awards” (+13.6 percent). All the other categories have projected growth rates below the 10.4 percent

\(^{14}\) The largest projected growth in a detailed occupational category among all BLS job categories is within this health practitioners group: registered nurses, a category that is expected to add 587,000 net new jobs, or 23 percent of its 2006 employment (89).
gain expected for employment as a whole. All the employed postsecondary degree-holders (associate’s degree and up) in aggregate are expected to increase by 15.8 percent compared to 8.2 percent—or not much more than half as much—for those with only work experience or on-the-job training as credentials, with postsecondary vocational awards in between at 13.6 percent.

It is important to note, however, that these differential growth rates do not imply that anything like “college for all” is on the near horizon in terms of the demands of the labor market. The total number of jobs in 2016 that will be held by people without any postsecondary credential is still expected to be far larger, at 114.288 million, than the number where a college degree (associate’s or higher) is the predominant credential, 42.959 million, and the absolute gain in the former classes of jobs will outstrip the latter by 8.651 million to 5.876 million. The bifurcated pattern in the labor market of course reflects the same underlying forces in the economy as the growing inequality identified above in earnings patterns by level of education.

In our view, the policy implication of these disparate patterns is not to try to engineer the education system to simply meet or follow the market, but rather to have its output (modestly) “lead the market,” which, as long as the rate of growth in the more educated is not too great, will likely serve to attract and even create more better-quality jobs within the economy. This is a fairly ambitious goal but, even short of it, the implication of stronger growth in jobs for and earnings returns to the more educated is surely to invest more, or facilitate more individual investment, in “human capital,” i.e., here college or graduate education, until the returns show signs of diminishing. Finally, since college attendance and degree attainment rates in relation to population have been quite sluggish in the most recent years, while nationwide the number of people in the traditional college age group is leveling off and more of them are from groups with lower

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15 Observe that the ratio of the gains in jobs for these two broad categories of credentials is far closer than the ratio of total jobs for each, reflecting the much more rapid rate at which the “college jobs” are growing.

16 This is the “equimarginal” returns implication of basic microeconomic investment theory.

historic attendance and completion rates, there seems to be little danger of overshooting
the mark (i.e., producing too many graduates) any time soon.\footnote{In its latest edition of its Projections of Education Statistics, the U.S. Department of
Education’s National Center for Education Statistics (Hussar and Bailey, 2007) foresees
(in its “middle alternative” projections) increases over the 12-year projection period from
2004-05 to 2016-17 in associate’s degree awards of 9% and bachelor’s degree awards of
26%. The projection for bachelor’s degree growth is several times the expected growth in
the young population over this period. The NCES enrollment projection methodology
takes into account the population size of each major race/ethnicity group and their
respective enrollment (participation) rates so should reflect the effects of the
demographic shift in the youth population toward previously underrepresented minority
groups (87-90). However, their approach does not take into account the expected shift
toward more lower-income youth (not to mention likely continued real price increases in
higher education) and thus their enrollment projections may well be biased upward.
Since the degree projections are based upon the enrollment projections, the effect carries
forward to these. Moreover, the NCES degree projection equations make no allowance
for the likely depressing effects on degree completion rates of having more students from
either underrepresented minorities or low-income groups (110-112) and thus are even
more likely to be upwardly biased, i.e., are likely to be higher than actual degrees
awarded, given past success rates of these students. Over the past nine projections’
series, according to NCES, the mean absolute percentage errors in their projections of
associate’s degrees have been 14.8% and of bachelor’s degrees 11.2% at 10 years from
the baseline (110).}

Moreover, many labor market analysts think that the BLS’s projections of gains in
the level of educational credentials sought by employers (observed as the credentials held
by workers) are too conservative. Prominent among these is economist Anthony
Carnevale, director of the Global Institute on Education and the Economy at Georgetown
University and formerly a senior Congressional staffer and vice president at the
Educational Testing Service. His main analytic point is that the BLS methodology for
estimating the future distribution of educational credentials among workers ignores long-
standing upward trends in these credentials within job categories, as BLS considers only
the effects of shifts in the occupational mix. Table 2-5, from Carnevale (2008), compares
BLS projections for the period 2002-12 with projections he and Jeffrey Strohl derived
from a “…projection of postsecondary upskilling [based] 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” (27). In
short, these analysts have extrapolated recent past trends in the proportion of college graduates in jobs into the future.

On this basis Carnevale projects relatively large additional employment for bachelor’s (2.9 million, or 42% more shown in column 6 than in column 3) and graduate degree holders (7.75 million, or 221% more) over and above the gains BLS projected for 2012. At the same time, the upskilling trend leads to reduced need for associate’s degree-holders and those with “some college” relative to the BLS projections, though Carnevale’s projected numbers for 2012 are still higher than the actual numbers of jobs held by people with these credentials in 2002. While these simple extrapolations may be too gross, the underlying point seems hard to argue against based on recent trends and what we know about contemporary economic change—that employment of the more educated will reflect some “upskilling” within job categories as well as shifts in the mix of job categories that tend in the same direction. Although some might say that some of this upskilling represents pure credential inflation, we have argued above that, as long as earnings growth rates for the more educated remain strong over time (and especially over individuals’ careers), the argument that increases in the credentials of job holders are unproductive is hard to sustain.

UNCERTAINTIES ABOUT THESE FORECASTS: THE UNCERTAIN POTENTIAL OF “OFFSHORING”

Forecasts about the future are always subject to error, especially those dependent upon assumptions about the nature and pace of technological change. Today, economic and technological change is more than ever a globalized phenomenon, thus projections are complicated by the growing interdependencies among economies all over the world and by the rapidity of diffusion of technological innovations. Of particular interest to our purposes in this chapter is the impact of the growing phenomenon of international outsourcing from the U.S.–“offshoring”–of jobs historically performed by college-educated workers here. The offshoring phenomenon has been felt in the U.S. for several decades in the manufacturing sector and for at least a decade in the services sector as

19 See note 13 on the historic range of error in BLS forecasts.
reduced transportation costs have facilitated the movement of manufacturing and then routine services functions (e.g., call centers or check processing) but has thus far had relatively little impact among highly educated workers (Blinder, 2006; Uhalde and Strohl, 2006). It seems clear, though, that with steady improvements in information and communication technologies that permit work products to be transferred digitally at minimal cost many medium and even relatively highly skilled categories of jobs may be vulnerable to such outsourcing (ibid.).

In its 2007 projections of the job market over the period 2006-2016, the Bureau of Labor Statistics sought to take account of the susceptibility of particular types of jobs to offshoring by assessing particular job characteristics thought to affect the likelihood that past relationships between U.S. economic activity and employment would be negatively affected. Thus its conclusions are taken into account in the data already presented. But, BLS analysts evidently made the adjustments judgmentally rather than by using a statistical algorithm (Franklin, 2007, 9; “Accounting for Offshoring…”). This is not surprising as the emergence of any significant offshoring of highly skilled jobs is quite recent and research on the phenomenon is in its infancy. Given the dependence of projections of its future pace on a host of hard to predict technological advances, competitive conditions and possible policy responses around the globe, it is quite difficult to forecast how many “college jobs” in the above categories may migrate abroad and how fast. One largely uncontrollable factor is that if developing economies, notably China and India, continue to grow at a rapid pace U.S.-based firms will inevitably offshore some jobs connected to these markets in order to better serve them as well as in response to pressures they may face from these governments. On the other hand, “…the spread of build-to-order and just-in-time strategies, such as lean retailing, are likely to keep many jobs in the U.S.” (Troppe and Carlson, 2006, 13).

“Early” studies estimated that the U.S. would lose about 3.4 million white-collar jobs overseas by 2015 (McCarthy 2002), a rate of about 300,000 jobs a year from their baseline. Bardhan and Kroll (2003) estimated that many more jobs, about 11% of the total in the U.S. economy, might be at risk of being offshored and a recent McKinsey

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20 Prominent examples are movement of many computer programming jobs and even the reading of radiology scans and legal work to India (Lakshimi, 2008).
study produced a similar figure (Farrell and Rosenfeld, 2006).\(^{21}\) Blinder (2006) offers a rough estimate of the possibilities: “… that the total number of current U.S. service-sector jobs that will be susceptible to offshoring in the electronic future is two to three times the total number of current manufacturing jobs (which is about 14 million)” (113).

Uhalde and Strohl (2006) used the U.S. Department of Labor’s O*Net database, which identifies the characteristics of occupations, to refine estimates of job susceptibility based on offshoring patterns to date in relation to a range of job characteristics (use of physical strength, need for proximity to the client, ability to perform the work electronically and transport it instantaneously, etc.). They estimate that about 8 million jobs are at “high risk” to be offshored eventually and another 16 million are at “medium risk.” Yet another 16 million jobs are considered to be at low risk but still potentially offshorable. They provide a selected list of the jobs in each of these categories as shown below.

**Vulnerability of Selected Jobs to Offshoring**

**High Risk**

- Computer programmers
- Software engineers
- Accountants and auditors
- Financial credit analysts

**Medium Risk**

- Management analysts
- Tax preparers
- Architects
- Civil engineers

\(^{21}\) Farrell and Rosenfeld say, “Contrary to popular opinion, only 11 percent of U.S. jobs could be feasibly offshored and only a small fraction of these actually will be” (123).
Low Risk

- Physicians, surgeons, and health care support
- Marketing and sales managers
- Real estate brokers and agents


On the other hand, a job category’s being at risk of offshoring does not mean that all of the jobs will move and the pace at which they may move is exceedingly hard to forecast. Not only is the current level and pace of increase in such migration modest but studies show that firms consider many factors other than labor cost advantages when they consider whether to move jobs or functions abroad. According to McKinsey, these “…include the location’s risk profile, the quality of its infrastructure, the size of the domestic market, non-labor costs, its business and living environment, and the availability of vendors” (Farrell and Rosenfeld, 2006, 128). McKinsey’s research shows that small companies, a large part of the U.S. economy, are much less likely to send work offshore because management tends to be less comfortable with the idea and does not want to bear the start-up and ongoing oversight costs that seem large relative to any potential cost savings for a small employer. Indeed, overall, McKinsey reports, “…our research finds that management resistance is the biggest factor holding back offshoring today, not government regulations” (ibid).

In sum, McKinsey estimates that “…U.S. companies will create 200,000 to 300,000 offshore jobs per year over the next 30 years” (ibid) and that, “The impact of offshoring on U.S. wages is imperceptible and its effects on employment are very small compared with normal job turnover in the economy (123),” conditions that they expect to persist for the foreseeable future. They also point out that, by helping U.S. companies to remain competitive, offshoring of some suitable jobs and production very likely leads to net gains in U.S. employment as firms invest a portion of cost savings in new technology

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22 That many of these factors—in addition to having many highly skilled workers—actually favor the United States, is suggested by the country’s strong performance in attracting investments by foreign companies, a measure on which it leads the world.
and market development. Many of these new jobs are in the higher skill categories, e.g., systems analysts and software engineers rather than programmers.\footnote{They note that overall U.S. employment in the computer and data-processing sector has grown far faster than overall employment and that, across the economy, both employment growth and wages are higher in tradable than non-tradable services (128-129).}

Finally, the McKinsey analysts recognize the fears and political contention that surround trade policies and call for much greater policy attention to helping those workers affected by trade-induced job loss (as well as other displaced workers) to obtain the education and training they need to find work in more promising lines.\footnote{The OECD reports that the re-employment rate of displaced workers in the U.S. economy is the highest in the world by almost a factor of two (cited in Farrell and Rosenfeld, 133). Yet, more clearly needs to be done to make transitions less painful and more likely to lead to new jobs with a promising future.} All of this once again suggests that higher education has a key role to play in preparing people to respond to the changes that accompany the contemporary global, knowledge-based economy.\footnote{The well educated have advantages in the face of job loss—they are not only generally more employable but also more able to profit from additional education or training.} As Blinder (2006) and others assure, flexible labor markets will adjust to shifting global competitive pressures and opportunities but, if these adjustments are to be made acceptable to those who must bear their costs, we must do much more to help them make the transitions and investments necessary to take advantage of the opportunities created.

**SKEPTICAL VIEWS ON THE PACE OF CHANGE IN DEMAND FOR HIGHER EDUCATION**

As suggested earlier, some analysts in this field question the more expansive views of the growth in demand for higher education. Prominent among these are former Labor Department official Paul Barton (2008), analysts based at the Washington-based Economic Policy Institute—see especially Handel (2005) and Mishel and Rothstein (2007)—and academic scholars Norton Grubb and Marvin Lazerson (2004). While none believes that there will not be some legitimate growth in demand for higher education that the nation should meet, they question the future foreseen by analysts such as...
Carnevale, Uhalde and Strohl, and the New Commission on the Skills of the American Workforce and tend to see the BLS projections—which we have critiqued as likely to be conservative—as closer to the true mark.  Using primarily the BLS’s data over past periods they suggest that recent trends do not suggest more than a modest rate of “upskilling” of jobs at most, indeed they tend to feel that the BLS data on employment by education masks some overqualification for the jobs that exist.  Mishel and Rothstein note the dip in real earnings of college degree holders from about 1999-2003 (see Figure 2-1) and conclude that this portends a possible glut.  They believe that any newly available public resources would be better spent on human capital investments mostly outside the college realm (with the exception of measures to improve equity in financial aid to students), worker protections, subsidized health insurance, better social services for the needy, and greater macroeconomic stimulus.

Grubb and Lazerson echo some of these ideas in their recommendations (2004, chapter 8) but focus particularly on the need to improve the links between schooling and work at an earlier point in the educational system, to enhance the quality and equity of K-12 schooling, and to find appropriate pathways to decent careers for students who are not much interested in college.  Crucially, they want to improve the clarity of career ladders and “crosswalks” so that youths who choose vocational pathways at the outset have well-understood and subsidized opportunities to enhance their human capital once in the labor market—even to attain a college degree—and to be rewarded for doing so.  As is suggested by the title of their book, Beyond College for All, they are as skeptical as the other analysts about the need for any more college-educated individuals than a continuation of the recent modest upward trends would produce.

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26 Refer to Table 2-3, derived from the BLS’s Dohm and Shniper (2007, Table 5), which projects gains in employment over 2006-2016 in jobs where bachelor’s degrees are the most common level of education at a rate of about 1.5% per year.  Growth in jobs where associate’s or master’s degrees are the most common educational credential are projected by BLS to grow at a slightly faster pace, approximately 1.7% per year.

27 Note, however, that income trends for well-educated males turned upward again once the 2000-2003 downturn ended and, after a much shallower dip, the same was true for females (Figure 2-2).
CONCLUSION

As already stated, we are well aware of the hazards of efforts to forecast with great precision the future labor market’s demand for people of varying levels of education. We are also sympathetic to the notion that the future prosperity of the nation and equitable distribution of its fruits depends upon much more than higher education policies. In particular, broad-ranging steps that begin early to improve students’ preparation for college are clearly crucial and Grubb and Lazerson’s carefully nuanced ideas for creating a more seamless system spanning K-12 education, postsecondary education (including but not limited to traditional college education) and work in a knowledge-intensive society seem to us to be on the right track. But here our primary focus is on getting some handle on the amount of college education capacity and output the nation needs so that we can consider how to plan for it. We believe that, barring large unforeseen shocks, the weight of the evidence indicates that the economy could and would profitably absorb more college graduates than the BLS forecasts call for, primarily because these projections do not take account of the long-standing and probably escalating pattern whereby educational credentials tend to increase within job categories (i.e., not just because of shifts in the job mix in favor of categories employing more educated people which is all that BLS considers). If college degree output gains were to stay slightly ahead of conventionally-defined labor market demand growth, historical patterns suggest the excess would not only be profitably absorbed but likely would stimulate further “endogenous growth” through greater innovation and the like.

In point of fact though, we think the greater challenge may be simply to keep up with historical patterns of growth in degree output, which is surely a minimal target if the nation is to remain internationally competitive. Overshooting the mark significantly relative to labor market demand seems improbable given that so many more of the young population will come from lower-income circumstances as inequality continues to widen and as the hue of the youth cohort shifts increasingly from predominantly white toward the shades of more and more people of color. These populations have, with the exception of some Asian subgroups, not fared nearly as well in K-12 preparation or in college enrollment and completion as have the traditional majority population. It will thus
require either greater resources per student or a great deal more ingenuity and efficiency to produce the regular gains in college graduates that we have taken for granted in the past (without degrading quality). In light of the grave difficulties facing public finances generally and the pattern of stagnation in state support for higher education that the past several decades have witnessed—combined with increases in student charges that work against access and completion for those of modest wealth—the challenge is great indeed. In the rest of this book we consider how it can be met in practical and politically feasible terms. The next chapter begins this task by explaining the financing structure of American higher education including both its salient recent history and key emerging trends.
REFERENCES


23


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<table>
<thead>
<tr>
<th>Major occupational groups 11-0000 through 13-0000 in the 2000 Standard Occupational Classification</th>
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<tr>
<td>2006 National Employment Matrix code and title</td>
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<td>2000</td>
</tr>
<tr>
<td>30-0000 44 Occupations</td>
</tr>
<tr>
<td>31-3900 Service Occupations</td>
</tr>
<tr>
<td>41-0000 Sales and related occupations</td>
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<tr>
<td>47-0000 Construction and extraction occupations</td>
</tr>
<tr>
<td>49-0000 Installation, maintenance, and repair occupations</td>
</tr>
<tr>
<td>53-0000 Transportation and material moving occupations</td>
</tr>
<tr>
<td>45-0000 Farming, fishing, and forestry occupations</td>
</tr>
<tr>
<td>11-1300 Management, business, and financial occupations</td>
</tr>
<tr>
<td>51-0000 Production occupations</td>
</tr>
</tbody>
</table>

| 22,449 | 23,022 | 23,096 | 23,674 | 24,489 | 25,060 | 25,703 | 26,145 | 27,526 |
| 12,938 | 13,017 | 13,418 | 13,534 | 13,730 | 13,814 | 13,913 | 14,015 | 14,015 |
| 5,999 | 6,129 | 6,259 | 6,085 | 6,303 | 6,491 | 6,681 | 6,708 | 6,708 |
| 5,160 | 5,318 | 5,219 | 5,226 | 5,247 | 5,305 | 5,362 | 5,390 | 5,390 |
| 9,539 | 9,593 | 9,345 | 9,415 | 9,527 | 9,654 | 9,628 | 9,628 | 9,628 |
| 463 | 461 | 453 | 451 | 462 | 445 | 443 | 450 | 450 |
| 12,423 | 12,402 | 11,889 | 11,865 | 11,575 | 11,139 | 11,179 | 12,019 | 12,019 |
| 12,923 | 12,940 | 11,270 | 10,727 | 10,488 | 10,154 | 10,249 | 10,368 | 10,368 |

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<td>808</td>
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<td>250</td>
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<td>90</td>
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<tr>
<td>15</td>
</tr>
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<td>-406</td>
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<td>-2475</td>
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<tr>
<td></td>
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<td>2016</td>
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<td>00-0000 Total, All Occupations</td>
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<td>9,079</td>
<td>5.5</td>
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<td>6,433</td>
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<td>1,039</td>
<td>1,010</td>
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1 Major occupational groups 11-0000 through 13-0000 in the 2000 Standard Occupational Classification
2 Major occupational groups 15-0000 through 29-0000 in the 2000 Standard Occupational Classification
3 Major occupational groups 31-0000 through 39-0000 in the 2000 Standard Occupational Classification

Source: Dohm & Shniper (2007) Table 1. p. 88
<table>
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<th>Professional and related occupations with largest growth</th>
<th>Numeric change (thousands)</th>
<th>Percent change</th>
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<td>Computer and mathematical science</td>
<td>822</td>
<td>24.8</td>
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<tr>
<td>Community and social services</td>
<td>541</td>
<td>22.7</td>
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<td>Arts, design, entertainment, sports, and media</td>
<td>305</td>
<td>11.4</td>
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<tr>
<td>Architecture and engineering</td>
<td>268</td>
<td>10.4</td>
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<tr>
<td>Life, physical, and social science</td>
<td>203</td>
<td>14.4</td>
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<tr>
<td>Legal</td>
<td>145</td>
<td>11.8</td>
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Source: Dohm & Shniper (2007) p. 89
<table>
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<tr>
<th>Most significant source of education and training</th>
<th>Employment</th>
<th>Change, 2006-2016</th>
<th>Total job openings due to growth and net replacement needs, 2006-2016¹</th>
<th>May 2006 median annual wages²</th>
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<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
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<td>Percent</td>
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<tr>
<td>Total, all occupations</td>
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<td>100.0</td>
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<td>First professional degree</td>
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<td>1.3</td>
<td>2,247</td>
<td>1.4</td>
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<td>Doctoral degree</td>
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<td>1.3</td>
<td>2,462</td>
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<td>Master's degree</td>
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<td>1.4</td>
<td>2,575</td>
<td>1.5</td>
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<td>Bachelor's or higher degree, plus work experience</td>
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<td>4.3</td>
<td>7,117</td>
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<td>12.3</td>
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<td>Long term on the job training</td>
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<td>52,339</td>
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<td>56,951</td>
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¹ Total job openings represent the sum of employment increases and net replacements. If employment change is negative, job openings due to growth are
² For wage and salary workers, from the Occupational Employment Statistics survey

Source: Dohrn & Shniper (2007) Table 5, p. 103
## Differences between official projections of jobs in 2012 and projections assuming historical rates of upskilling in educational credentials

<table>
<thead>
<tr>
<th></th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
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<tr>
<td>Actual jobs and education levels in 2002</td>
<td></td>
<td></td>
<td></td>
<td><strong>Official projection of jobs in 2021 holding educational attainment constant by occupation</strong></td>
<td><strong>Difference between 2002 actual jobs and 2012 official projection</strong></td>
<td><strong>Projections of job increases or decreases to 2012 based on historical increases in postsecondary education requirements</strong></td>
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<td>Less-than-high-school jobs</td>
<td>16,482,666</td>
<td>18,069,367</td>
<td>1,586,701</td>
<td>12,068,287</td>
<td>(4,414,379)</td>
<td>(6,001,080)</td>
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<td>44,698,388</td>
<td>51,612,592</td>
<td>6,914,204</td>
<td>50,256,976</td>
<td>5,558,579</td>
<td>(1,355,616)</td>
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<td>Jobs that require some college</td>
<td>27,559,941</td>
<td>30,187,249</td>
<td>2,627,308</td>
<td>28,930,825</td>
<td>1,370,884</td>
<td>(1,256,424)</td>
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<td>Associate’s degree</td>
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<td>4,584,536</td>
<td>15,044,029</td>
<td>2,716,431</td>
<td>(1,868,105)</td>
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<td>Bachelor’s degree</td>
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<td>15,255,880</td>
<td>2,416,857</td>
<td>22,979,341</td>
<td>10,170,318</td>
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<td>Total civilian jobs</td>
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<td>165,302,000</td>
<td>25,018,774</td>
<td>165,483,000</td>
<td>252,000,615</td>
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</tbody>
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Carnevale (2008) p. 27
Figure 2-1: Median income in constant 2006 dollars for males 25 years and older, 1958 to 2006

Source: Calculated from the U.S. Census Bureau (2007).
Figure 2-2: Median income in constant 2006 dollars for females 25 years and older, 1963 to 2006

Source: Calculated from the U.S. Census Bureau (2007).
Figure 2-3: Mean income in 2005 CPI-U-RS adjusted dollars received by each fifth and top 5 percent of families, all races: 1966 to 2005

Figure 2-4: Estimated baccalaureate degree attainment by age 24 by family income quartile: 1970 to 2005

Source: Mortenson (December 2006)
Figure 2-5: Percent of individuals 25 to 29 years of age who have completed college, by race and Hispanic origin: selected years 1940 to 2007.
Figure 2-6: Percent of children with a college degree by parents' family income quintile, 2005

- All adult children: 29%
- Top: 53%
- Fourth: 38%
- Middle: 25%
- Second: 20%
- Bottom: 11%

Source: Haskins (2008) p. 96