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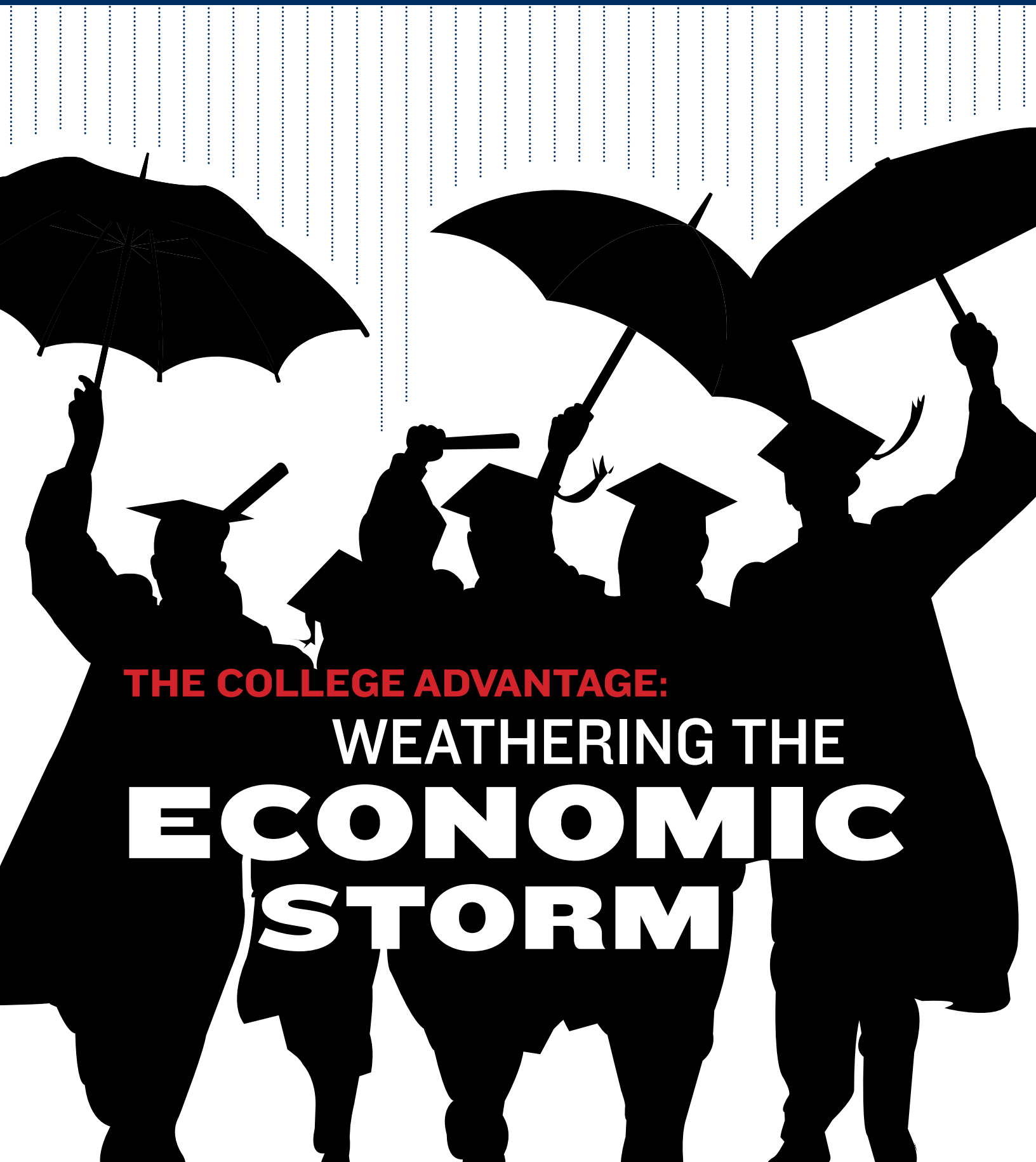

THE COLLEGE ADVANTAGE: WEATHERING THE ECONOMIC STORM

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ACKNOWLEDGEMENTS

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We undertook this report to help advance the discussion and understanding of the effect of education on employment in the Great Recession and recovery. We believe the role education has had in job losses and job gains in the recession and recovery has not received its due emphasis because media attention has focused on how men and women have been affected differently during the stormy economic period.

Many have contributed their thoughts and feedback to the research, methodological decisions, content, and design of this report. That said, all errors, omissions, and views remain the responsibility of the authors.

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TABLE OF CONTENTS

INTRODUCTION

The rising cost of college education and high unemployment levels among recent college graduates are raising the question "Is college worth its cost?" in the minds of many Americans. A recent study published by the Associated Press found that one out of every two recent college graduates is jobless or underemployed, suggesting maybe college isn't worth the money.[1] Yet, job losses in the recession and job gains in the early recovery tell a very different story.

The marked global economic decline that began in December 2007, termed the Great Recession, severely damaged the economic progress of the United States. Employment gains of a decade were lost, sending January 2010 employment down to August 1999 levels.[2, 3]

The Great Recession was the longest recession since World War II and recovery from it has been slow. By early 2012, only about half, 47 percent, of the jobs lost during the recession had been regained. Job creation is still insufficient to move the unemployment rate below 8 percent.

The recession hit those with less schooling disproportionately hard—nearly four out of five jobs lost were held by those with no formal education beyond high school. At the other end of the spectrum, workers who had completed a four-year college degree or higher were largely protected against job losses during the recession and some had job gains. The job recovery has only increased the divide between the less-educated and more-educated.

The recession hit those with less schooling disproportionately hard.

More than half of the employment increases have gone to workers with a Bachelor's degree or better, the rest of the gains to those with some college education or an Associate's degree. Even in the recovery, workers with only a high school diploma or less have continued to lose jobs.

The media have coined the terms "man-cession" and "man-covery," highlighting the differences in job losses and gains of men and women over the recession and recovery. But the differences between men and women are not as marked as those attributable to education. Men lost more and gained more, whereas less-educated individuals lost more in the recession and continue to lose jobs in the recovery. Men lost more jobs than women during the recession partly because men were in low-education jobs. They gained more jobs during the recovery by becoming more educated and by moving into occupations and industries (traditionally dominated by women) that demand high skills.

[1] http://www.cleveland.com/business/index.ssf/2012/04/half_of_recent_college_grads_u.html; http://news.yahoo.com/1-2-graduates-jobless-underemployed-140300522.html.

[2] These estimates are based on data from the total nonfarm payroll employment data available from the Current Employment Statistics, Bureau of Labor Statistics.

[3] The academic definition of the recession set by the Business Cycle Dating Committee of the National Bureau of Economic Research describes the recession as the 18-month period from December 2007 to June 2009. Since the economy did not begin adding jobs until January 2010, this paper uses the broader definition of the word "recession" as a period of reduced economic activity and, therefore, defines the recession as the period from December 2007 to January 2010.

THE GREAT RECESSION: FOCUS ON MEN OBSCURES JOB LOSSES BY LESS-EDUCATED

The recent recession affected workers very differently, depending on their level of educational attainment. Those with more education fared better than the less educated, while those with a Bachelor's degree or better even saw job gains. These patterns have continued during the recovery: Since January 2010, when the recovery began, job gains have been limited to those with more education.

LESS-EDUCATED WORKERS LOST NEARLY FOUR OUT OF FIVE JOBS DURING THE RECESSION.

The trends in job losses for the three education groups—those with a high school diploma or less, those with some college or an Associate's degree, and those with a Bachelor's degree or better—are shown in Figure 1. Job losses were concentrated among the less educated in the workforce. With 78 percent of the job losses, those with no education beyond high school were more than three times as likely to lose their jobs as those with some college education or an Associate's degree. Employment for those with a Bachelor's degree actually rose during the recession though not as much as it might have without the recession (Engemann and Wall, 2010).[4]

According to the Current Population Survey (CPS), 7.2 million jobs were lost in the 26 months beginning in December 2007 through January 2010.[5] Even if the National Bureau of Economic Research describes the recession as beginning in December 2007 and lasting until June 2009, the job market did not turn the corner until early 2010. Jobs are a lagging indicator because employers wait until the economy has improved before they start hiring again.

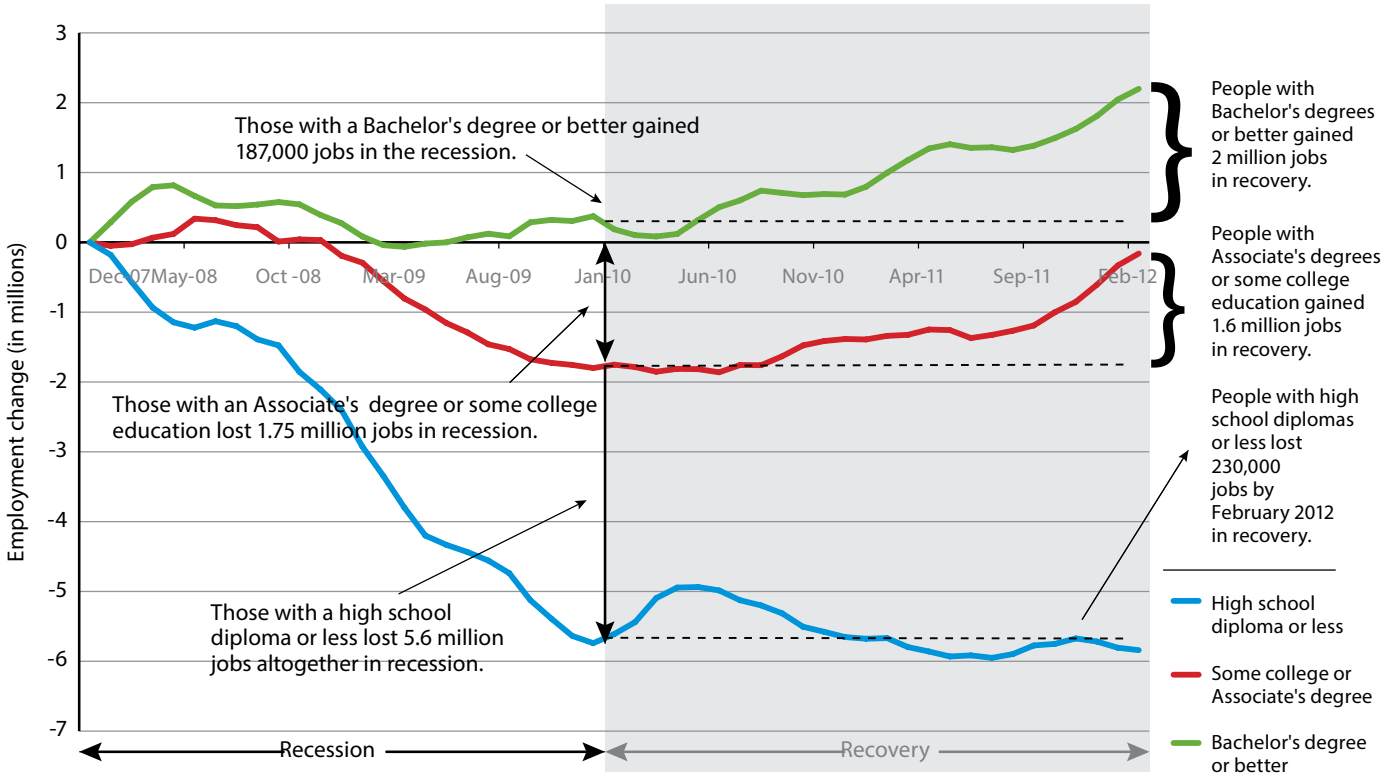
COLLEGE-LED RECOVERY

The economy so far has gained 3.4 million jobs since the recovery began. Despite the gains, the economy still remains 3 percentage points short of its prerecession employment. All of the post-recession recovery in the job market has gone to workers with education beyond high school, with greater job gains made by those with Bachelor's degrees or better (see Figure 1 and Table 1). Since job growth resumed in early 2010, employment by those with a Bachelor's degree or better has increased by 2 million, while employment by those with an Associate's degree or some college experience has increased by 1.6 million. Those with some college education or an Associate's degree have recovered nearly 91 percent of jobs lost during the recession, but are still short of their prerecession employment levels (see Table 1). In contrast,

[4] As can be seen from Figure 1, those with a Bachelor's degree or better gained about 800,000 jobs in the first few months of the recession and then lost all those gains and more (64,000 jobs) by May 2009. Since then, their employment level has been on a general upward trend. From the beginning of the recession to January 2010 (the point determined as a turn in the job market), total employment of workers with a Bachelor's degree or better increased by 187,000.

[5] The data for the paper come from the Current Population Survey (CPS), a monthly survey of households by the U.S. Census Bureau for the Bureau of Labor Statistics. However, a total of 8.7 million jobs was lost according to the Current Employment Statistics (CES) data—the official source used by the Bureau of Labor Statistics in its monthly jobs report—over the same period (December 2007–January 2010). These differences in job losses are because of differences in the two surveys—the Labor Department's establishment survey and the Current Population Survey. The establishment survey does not include self-employment and agricultural employment, but counts multiple-job holders more than once. Further, the month-to-month changes in the CPS are much more volatile than the employment measures from the establishment survey. Overall, both sources tell the same story: large job losses.

FIGURE 1: Workers with a high school diploma or less bore the brunt of the recession's job losses. Job gains in the recovery are confined to those with education beyond high school.



Source: Authors' estimate of the Current Population Survey data (2007–2012.) Employment includes all workers aged 18 and older.
Note: The monthly employment numbers are seasonally adjusted using the U.S. Census Bureau X-12 procedure and smoothed using four-month moving averages. The graph represents the total employment losses by education since the beginning of the recession in December 2007 to January 2010 and employment gains in recovery from January 2010 to February 2012.

TABLE 1: Job gains by individuals with Bachelor's degrees or better made up for over a third of losses by those with high school diplomas.

Educational Attainment	Job Change			Percent Job Change (%)		
	Recession*	Recovery**	Net Change***	Recession*	Recovery**	Net Change***
High school or less	-5,611,000	-230,000	-5,841,000	-10%	0%	-10%
Some college/Associate's degree	-1,752,000	1,592,000	-160,000	-4%	4%	0%
Bachelor's degree or better	187,000	2,012,000	2,199,000	0%	4%	5%
All	-7,176,000	3,374,000	-3,802,000	-5%	2%	-3%

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

* *Recession – The period from December 2007 to January 2010.*
** *Recovery – The period from January 2010 to February 2012.*
*** *Net Change – The period from December 2007 to February 2012.*

people with a Bachelor's degree or better have experienced a net increase of 2.2 million jobs over their prerecession levels.

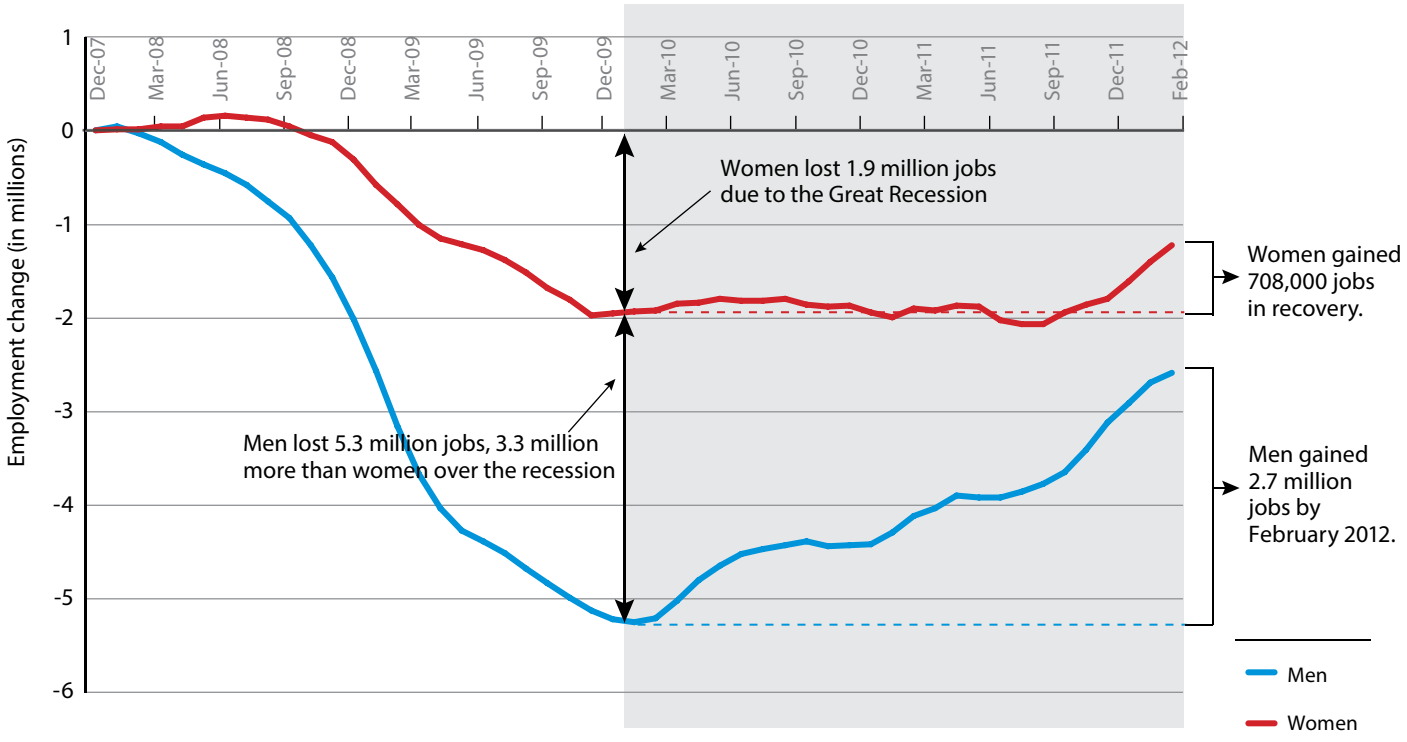
Those with only a high school diploma or less continue to experience job losses, though in much smaller numbers (see Table 1). In part this is due to the financial bubble that created a corresponding bubble in housing and construction jobs. When the housing market recovers, the construction industry will create some demand for workers with a high school diploma or less. Yet, it is hard to expect any substantial job gains in the near future for job seekers with no postsecondary schooling.

The demand for educated workers is much greater than the education distribution of the general employment would suggest. At the start of the recession, 39 percent of jobholders had only a high school diploma or less. Employment of those with a high school diploma or less declined further in the recovery as job gains were by those with education beyond high school. As a result, the share of jobholders with a high school diploma or less fell by 3 percentage points to 36 percent (by February 2012).

MEN LOST MORE JOBS IN RECESSION AND GAINED MORE IN RECOVERY.

Men lost nearly three times as many jobs as women in the recession, as depicted in Figure 2. By January 2010, a total of 7.2 million people had lost jobs and 5.25 million of them were men. Women also lost more than 1.9 million jobs. In all, men lost 3.3 million more jobs than women. But, as discussed later in more detail, among men and women, the greatest job losses were by the less educated. The number of job losses decreased with additional years of education and the most

FIGURE 2: Men lost three out of every four jobs over the recession. Almost four out of five jobs gained in the post-recession went to men.



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.
Note: The monthly employment numbers are seasonally adjusted using the U.S. Census Bureau X-12 procedure and smoothed using four-month moving averages. The graph represents the total employment losses by sex since the beginning of the recession in December 2007 to January 2010 and employment gains in recovery from January 2010 to February 2012.

TABLE 2: Despite the large gains by men in the recovery, men are further away from their prerecession employment than women.

Sex	Job Change			Percent Job Change (%)		
	Recession*	Recovery**	Net Change***	Recession*	Recovery**	Net Change***
Men	-5,250,000	2,666,000	-2,584,000	-7%	4%	-3%
Women	-1,926,000	708,000	-1,218,000	-3%	1%	-2%
All	-7,176,000	3,374,000	-3,802,000	-5%	2%	-3%

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

* *Recession – The period from December 2007 to January 2010.*
** *Recovery – The period from January 2010 to February 2012.*
*** *Net Change – The period from December 2007 to February 2012.*

educated workers gained jobs in the recession. In the recovery, men have regained some lost ground. Four out of every five jobs added to the economy (or 79 percent) have gone to men, leading mainstream media to coin the term "man-covery." But, because men lost more jobs than women, men are still further from their prerecession employment levels than women. To reach their prerecession employment levels, men need 2.6 million more jobs while women need 1.2 million jobs (see Table 2). Women continued to see small job losses through mid-2011 in the recovery; most of their job gains came in the second half of 2011. Again, among both men and women, the better educated gained jobs while the less educated continued to experience job losses.

BUT WOMEN LOST MORE IN THIS RECESSION THAN PRIOR RECESSIONS.

Men have lost more jobs than women during every recession (Figure 3), thus job losses for men in an economic downturn should not come as a surprise. But this recession's impact on women's employment was much greater than in previous recessions. Losses to women in prior recessions were in the form of slowdowns in their rate of job growth,

Those with a high school diploma or less need 5.8 million more jobs to reach their prerecession employment level, while workers with a Bachelor's degree or better have 2.2 million jobs over their prerecession level.

but in this recession women suffered actual job losses. According to Engemann and Wall (2010), "compared to previous recessions, men have actually borne a smaller proportion [of job losses] during this one."[6]

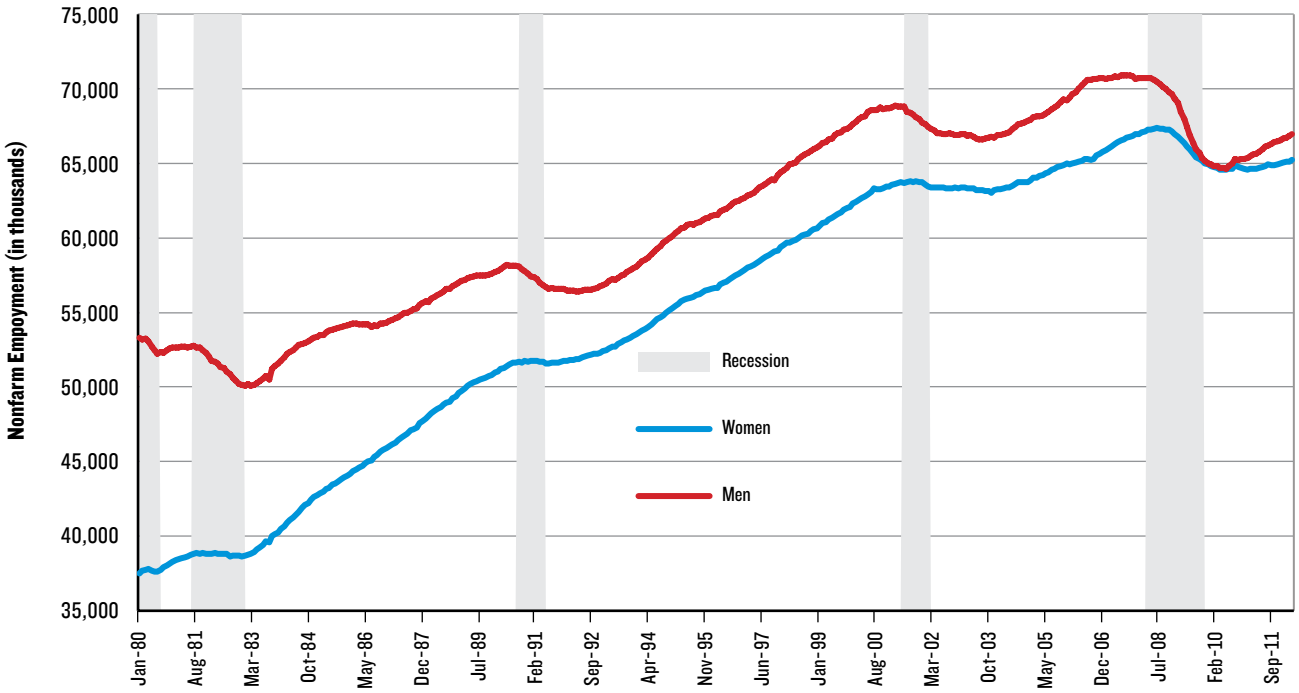
GREATER LOSSES BY LESS EDUCATED OF BOTH SEXES

Among men and women, as shown in Figure 4, less-educated workers experienced the vast majority of job losses. Women with a high school diploma or less lost 2 million jobs during the recession while men with the same level of education lost 3.6 million jobs. In comparison, women with a Bachelor's degree or better actually gained 381,000 jobs over the recession and men with a Bachelor's degree or better lost fewer than 200,000.

Job gains for both sexes in the recovery were primarily by those with at least some postsecondary education. Women with a Bachelor's degree or bet-

[6] Engemann, Kristie and H. Wall (2010), "The Effects of Recessions Across Demographic Groups," Federal Reserve Bank of St. Louis Review, January/February 2010, 92(1), pp. 1–26.

FIGURE 3: Men have lost jobs during every recession, but women lost more in the last recession than any prior recession.



Source: Authors' estimate of total nonfarm payroll employment using the Current Employment Statistics, Bureau of Labor Statistics. The gray shaded areas indicate recessions as reported by the National Bureau of Economic Research.

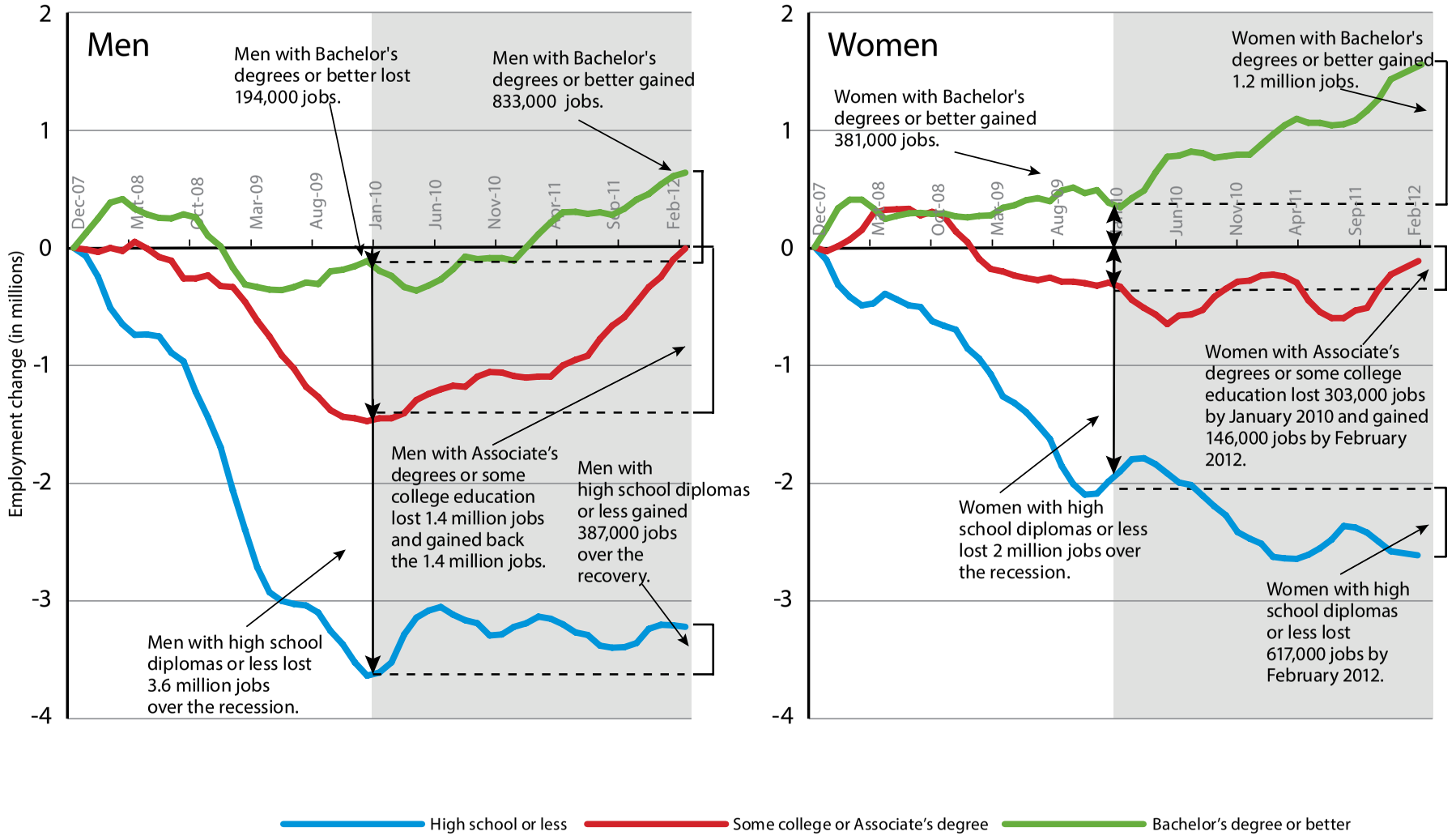
Forty percent of employed men stopped their schooling with a high school diploma or even before, compared with only 32 percent of women.

ter added 1.2 million jobs and men with the same educational attainment gained more than 833,000 jobs. Women with a high school diploma or less continued to lose jobs in the recovery, raising their total loss since the beginning of the recession to 2.6 million. Men with a high school diploma or less gained back nearly 400,000 jobs in the recovery but, with a loss of 3.6 million jobs during the recession, they still had a net loss of 3.2 million jobs.

Men lost nearly three times as many jobs as women, in part, because men exit schooling before women.[7] Forty percent of employed men stopped their schooling with a high school diploma or even before, compared with only 32 percent of women. There are 8.5 million more men than women in the workforce who only have a high school diploma or less.[8] Women workers often are attractive to employers, not only because they tend to be more educated, but because employers are able to hire them at lower wages than those paid to men with the same level of education.[9] At every education level, women earn on average three quarters of what men earn.

[7] The same argument is made by Engemann and Wall (2010).
[8] Relatedly, 45 percent of all men in the 25 and older population have a high school diploma or less, whereas 43 percent of women in the same population have that level of education.
[9] The gender wage gap remains one of the most stark inequalities women face in the workplace. A substantial gender wage gap remains even after controlling for level of education, occupational and industry choice, and age (Blau and Kahn, 2007).

FIGURE 4: Education level determined employment changes and opportunities for both men and women.

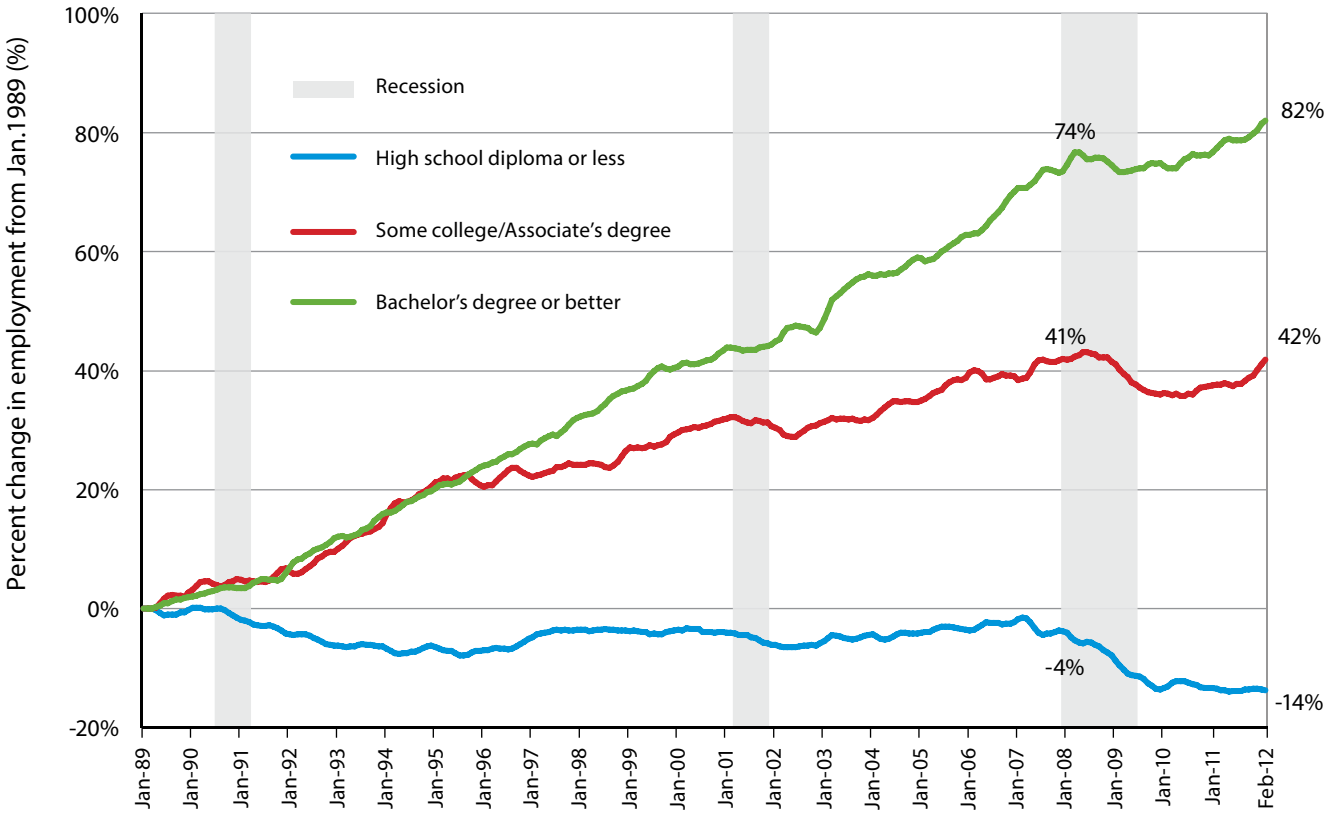


Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. The monthly employment numbers are seasonally adjusted using the U.S. Census Bureau X-12 procedure and smoothed using four-month moving averages.
Note: The graph represents the total employment change by education since the beginning of the recession in December 2007.

TRENDS BEGAN BEFORE THE GREAT RECESSION

Increases in the employment of workers with at least some college experience and decreases in the number of jobs available for workers with only a high school diploma or less as their highest educational attainment are trends that have developed over several decades. From 1989 to February 2012, total employment in the United States grew by nearly 23 percent, from 114 million to 140 million.[10] Despite the increase in total employment in that period, the number of workers with a high school diploma or less slowly declined (see Figure 5). The number of workers with a high school diploma or less at the beginning of the recession in December 2007 was already 4 percent below its 1989 employment level. Today, the number of

FIGURE 5: Employment growth in the past two decades has been entirely through increases in the number of workers with some postsecondary education, while employment for those with a high school diploma or less has declined.



Source: Authors' estimate using Current Population Survey data (1989–2012). Employment includes all workers aged 18 and older. The monthly employment numbers are seasonally adjusted using the U.S. Census Bureau X-12 procedure and are smoothed using four-month moving averages. The areas shaded in gray indicate periods of recessions as reported by the National Bureau of Economic Research.

[10] Authors' estimate using Current Population Survey (CPS) data.

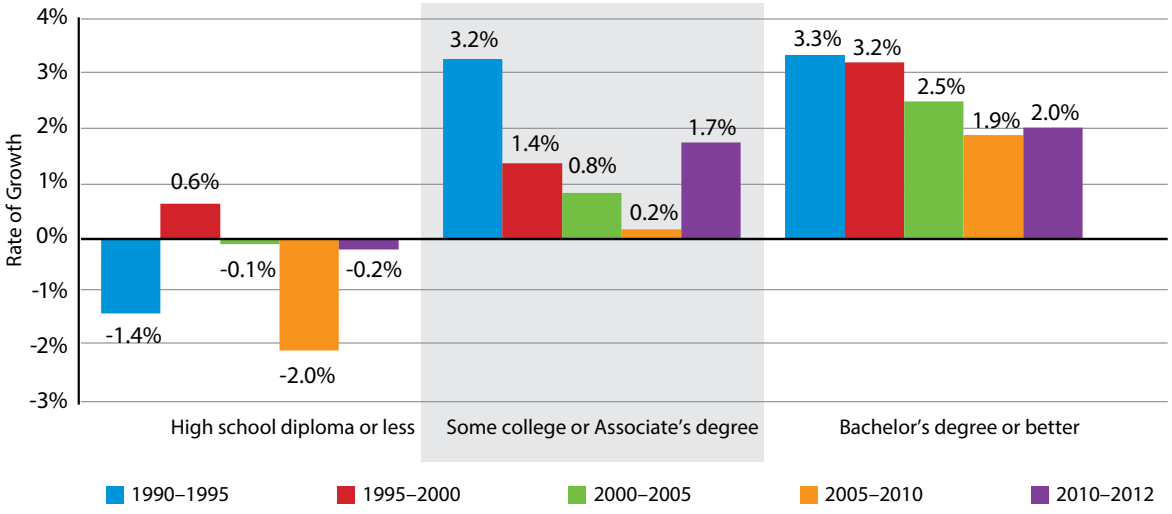
workers with a high school diploma or less is 14 percent (or 8 million) below its 1989 level. In other words, employment growth since 1989 has been driven entirely by workers with education beyond high school. The number of workers with some college or an Associate's degree has increased by 12 million or 42 percent from its 1989 level. The number of workers with a Bachelor's degree or better has nearly doubled (an 82 percent increase) from 26 million in 1989 to 48 million today.

The shift in the workforce from less-educated to more-educated has been a slow and steady process brought about by technological development and increased global competition that led to automation of the workplace and offshoring. Labor-saving technological development and, to a lesser extent, offshoring have increased the demand for skilled labor. In this report, this long-term gradual increase in the demand for skilled workers is referred to as "upskilling" in the U.S. labor market.[11]

This trend in the labor market suggests that much of the hiring of those with a high school diploma or less has been for replacement jobs that become available when workers retire or otherwise permanently leave the workforce and that job destruction has occurred faster than job creation. The workforce of those with a high school diploma or less has declined from 58.5 million to 50.5 million over the past three decades. In such an environment, the best alternative for the less educated to increase employability is to seek more schooling.

Jobs requiring an Associate's degree or some college grew at an average rate of 3 percent per

FIGURE 6: Employment of workers with a Bachelor's degree or better grew at a 2 percent to 3 percent rate over the past two decades.
Average annual growth rate of employment by education in five-year intervals



Source: Authors' estimate using Current Population Survey data (1990–2012). Employment includes all workers aged 18 and older.
Note: The monthly employment numbers are seasonally adjusted using the U.S. Census Bureau X-12 procedure and are smoothed using four-month moving averages.

[11] A result of technological change, especially over the past three decades, has been substantial change in the nature of the work carried out in a large array of occupations (Autor, Levy, & Murnane, 2003). Much of this was due to the introduction of computers, which made some occupations or tasks obsolete and new occupations were introduced or others were required to take on additional tasks like word-processing or financial analysis. Initially, employers provided on-the-job training and education to fill the skill gaps. Over time, those new skills became the standard and the employers demanded them as they looked for replacements or to fill new positions. Thus, the responsibility of getting the necessary skills was transferred to the individual or the education system. This paper refers to this long-term change in the skill requirements of the workers/occupations as "upskilling." The term "upskilling" is also used to refer to improving the skills of workers through training, most of the time employer-provided training, so that workers will be better at their jobs.

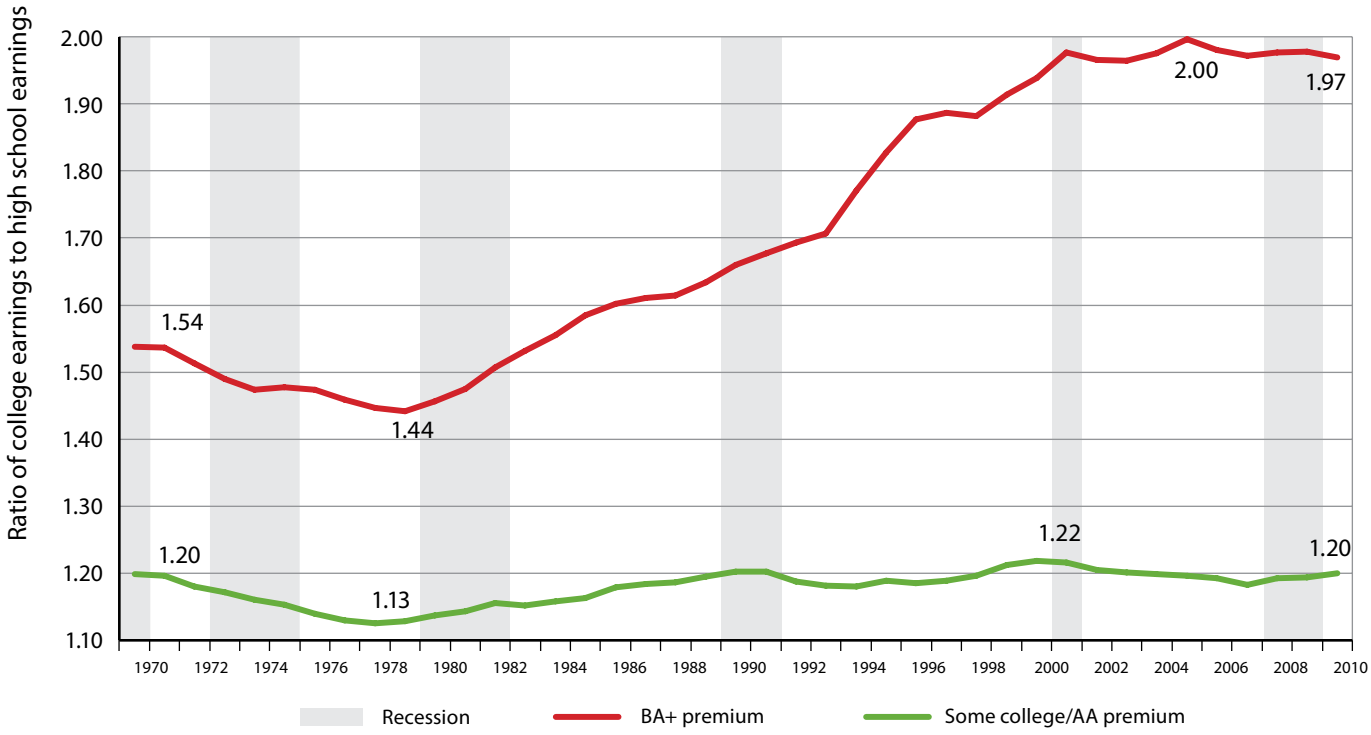
annum in the early 90s, but have slowed considerably since then (see Figure 6). Their employment grew at a rate of only 1 percent or less since the mid-90s. However, the employment growth rate of those with an Associate's degree or some college has been nearly 2 percent over the past two years. Employment of workers with a Bachelor's degree or better has increased at a steady average annual growth rate of 2 percent to 3 percent over the past two decades, as shown in Figure 6.

THE COLLEGE EARNINGS PREMIUM HAS REMAINED HIGH AND STABLE OVER THE RECESSION.

The average earnings of a Bachelor's degree-holder remains nearly twice as much as those of a worker with only a high school diploma.

Despite their substantial growth in employment over the past two decades, the supply of workers with a Bachelor's degree or better has not kept up with the rising demand in the labor market, leading to increases in the Bachelor's wage premium (BA wage premium). This has been illustrated clearly by economists, including Autor (2011) and Goldin and Katz (2008). The BA wage premium—the ratio of the earnings of workers with at least a four-year college degree relative to earnings of high school-educated workers—is still high, as shown in Figure 7. The premium has risen steadily from a low of 1.44 in 1980 to a peak of nearly two-times that of median high school earnings in 2005. The BA wage premium has edged down a little since then to 1.97, as earnings of college graduates have stagnated over the recession and recovery.

FIGURE 7: Earnings of four-year college-educated workers remain nearly twice those of high school-educated workers.



Source: Authors' estimate using Current Population Survey data (1970–2011).
Note: The estimates are the three-month moving averages of mean earnings of full-time, full-year wage and salary workers ages 25 to 54. The four-year college earnings premium is the mean earnings of workers with Bachelor's degrees or better relative to the mean earnings of workers with only a high school diploma. The AA premium is the earnings of workers with Associate's degrees or some college relative to mean earnings of their high school only counterparts. The areas shaded in gray indicate periods of recession as reported by the National Bureau of Economic Research.
BA+ premium: wage premium for workers with Bachelor's degrees or better over workers with high school diplomas or less
Some college/AA premium: wage premium for workers with Associate's degrees or some college over workers with high school diplomas or less

Yet, today, the average earnings of a Bachelor's degree-holder remain nearly twice as much as those of a worker with only a high school diploma.

There has been very little change in the wage premium for workers with an Associate's degree or some college relative to wages of those with only a high school diploma. The annual wages of those with an Associate's degree or some college remained at around 20 percent above the wages of those with only a high school diploma between 1970 and 2010.

According to the 2011 Georgetown University Center on Education and the Workforce (CEW) report, *The College Payoff*, workers with Bachelor's degrees earned 84 percent more over a lifetime than high school graduates in 2009 (Carnevale, Rose and Cheah, 2011). Two decades ago, the lifetime premium was only 75 percent. Despite the large wage premium, men have failed to pursue higher education, a startling nonresponse. In 1980, only 19 percent of women in the labor force had a Bachelor's degree or better compared to 25 percent of men.[12] Three decades later, 36 percent of women in the labor force have a Bachelor's degree or better, but only 33 percent of men have the same level of education.

For decades, there has been a concentration of men in less-skilled, manual occupations including manufacturing, construction, transportation, and utilities. Women, on the other hand, have taken up non-manual service occupations such as healthcare, teaching, and retail trade. These service occupations are less likely to be transferred overseas or carried out by machines and are more likely to demand a higher level of education. At the same time, it has been apparent that the semi-skilled office jobs and the less-skilled, middle-paying manufacturing industry jobs that fueled the expansion of the economy only a half a century ago are disappearing. Those jobs are being taken away by labor-saving technologies or sent off shore. The manufacturing sector shed 5.5 million jobs from 1980 to 2007, while jobs in two high-growth, high-skilled, women-dominated sectors, healthcare and education, increased by 11.6 million.[13]

The Great Recession sped up the loss of less-skilled, manual jobs, and because men dominate these occupations, they were hit hardest. But men's failure to pursue higher education provides another explanation for this recent "man-cession."

[12] Young, Anne M. (1983), "Recent trends in higher education and labor force activity," Bureau of Labor Statistics; http://www.bls.gov/opub/mlr/1983/02/rpt2full.pdf.

[13] Peck, Don. (September 2011). Can the Middle Class Be Saved? *The Atlantic* (http://www.theatlantic.com/magazine/archive/2011/09/can-the-middle-class-be-saved/8600/)

THE GREAT RECESSION: INDUSTRY DIFFERENCES

More than two-thirds of the job losses during the Great Recession were in construction and manufacturing. Table 3 shows the construction industry lost 2.5 million jobs by January 2010, which amounts to more than a fifth of its workforce, while manufacturing lost 2.7 million jobs or one out of every six workers. Wholesale and retail trade lost a million more jobs. Losses in the financial sector, transportation and utilities, and professional and business services combined accounted for 2 million jobs. Altogether, job losses totaled 8.7 million. Industries that held up well during the recession included public administration, educational services, and healthcare. They added nearly 1.5 million jobs, reducing net job losses over the recession to 7.2 million.[14]

Despite large gains, total employment in manufacturing remains far below the level at the start of the recession.

Except for a slowdown in its rate of losses, the construction industry has not seen much of a recovery in the past two years. Today, net job losses in construction since December 2007 stand at 2.6 million (see Figure 8). The manufacturing sector bounced back remarkably well; it has reported the highest job gains in the recovery, adding over a million jobs. Despite large gains, total employment in manufacturing remains far below the level at the start of the recession. However, professional and business services, personal services, and natural resources not only have recouped their losses but also have moved beyond their December 2007 employment levels.

The only two industries to record net job gains both in recession and recovery are healthcare services and leisure and hospitality services. These two industries had the highest net job gains; combined they added 1.5 million jobs over the recession and recovery. Despite a considerable slowdown in the rate of growth of employment in the recovery, healthcare services added nearly a million jobs over the past five years (see Figures 8 and 9).

There were a few industries that experienced job losses during the recovery, including two of the supposedly "recession-proof" industries that made job gains through the recession. The industries were public administration, educational services (public and private combined), construction, and information services.

Even though public administration and educational services held strong over the recession, these "recession-resistant" industries experienced job losses in the early recovery because of severe cuts in public budgets. About 170,000 jobs in public administration and 160,000 jobs in educational services were lost in the past two years. Any job

[14]These job losses are estimated using the Current Population Survey, a monthly survey of households conducted by the U.S. Census Bureau for the Bureau of Labor Statistics.

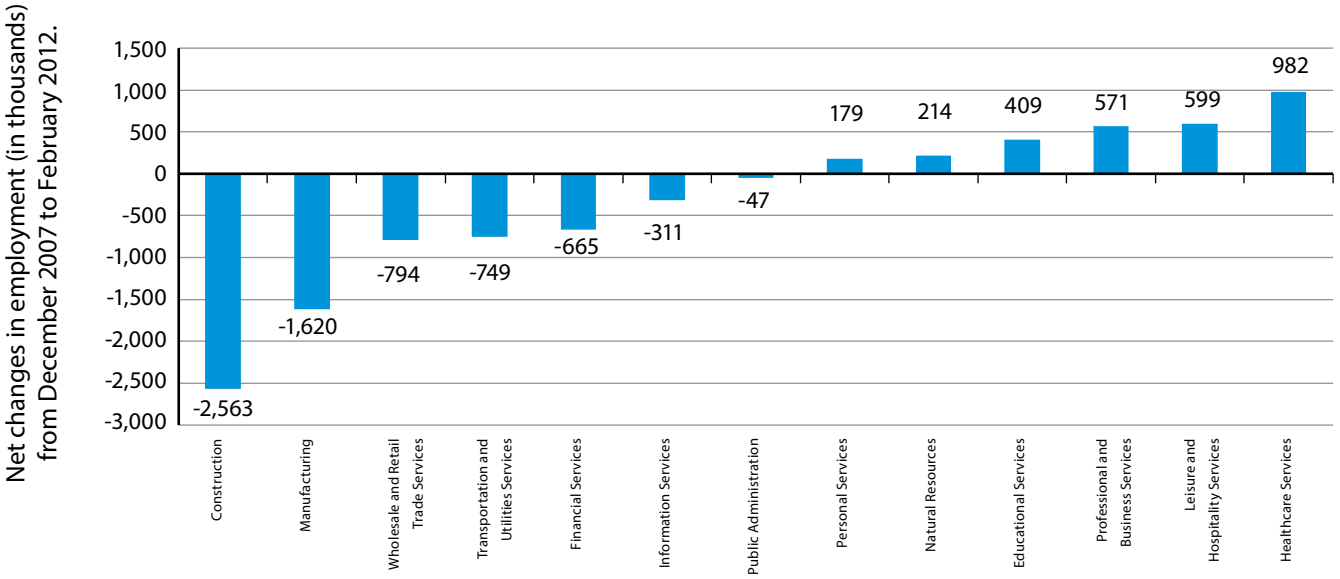
TABLE 3: More than two-thirds of the job losses in the recession were in construction and manufacturing.

Major Industry Sector	Job Change in Recession (Dec. 07–Jan. 10)		Job Change in Recovery (Jan. 10–Feb. 12)		Net Job Change Recession and Recovery (Dec. 07–Feb. 12)	
	In thousands	% Change	In thousands	% Change	In thousands	% Change
Manufacturing	-2,745	-17%	1,125	8%	-1,615	-10%
Construction	-2,451	-21%	-112	-1%	-2,563	-22%
Wholesale and Retail Trade Services	-1,135	-6%	366	2%	-811	-4%
Transportation and Utilities Services	-855	-11%	106	2%	-749	-9%
Financial Services	-782	-8%	117	1%	-665	-6%
Professional and Business Services	-412	-3%	983	6%	571	4%
Information Services	-261	-8%	-50	-2%	-311	-9%
Personal Services	-85	-1%	263	4%	179	3%
Natural Resources	-18	-1%	232	8%	214	8%
Leisure and Hospitality Services	75	1%	523	4%	599	5%
Public Administration	122	2%	-169	-2%	-47	-1%
Educational Services	569	5%	-160	-1%	409	3%
Healthcare Services	799	5%	138	1%	987	6%
Total	**-7,176**	**-5%**	**3,362**	**2%**	**-3,802**	**-3%**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. Percent change in both recession and recovery are from the December 2007 employment level.

FIGURE 8: Some industries—such as professional and business services and personal services—have recovered all job losses from the recession, while losses in the construction and information industries continued to widen.

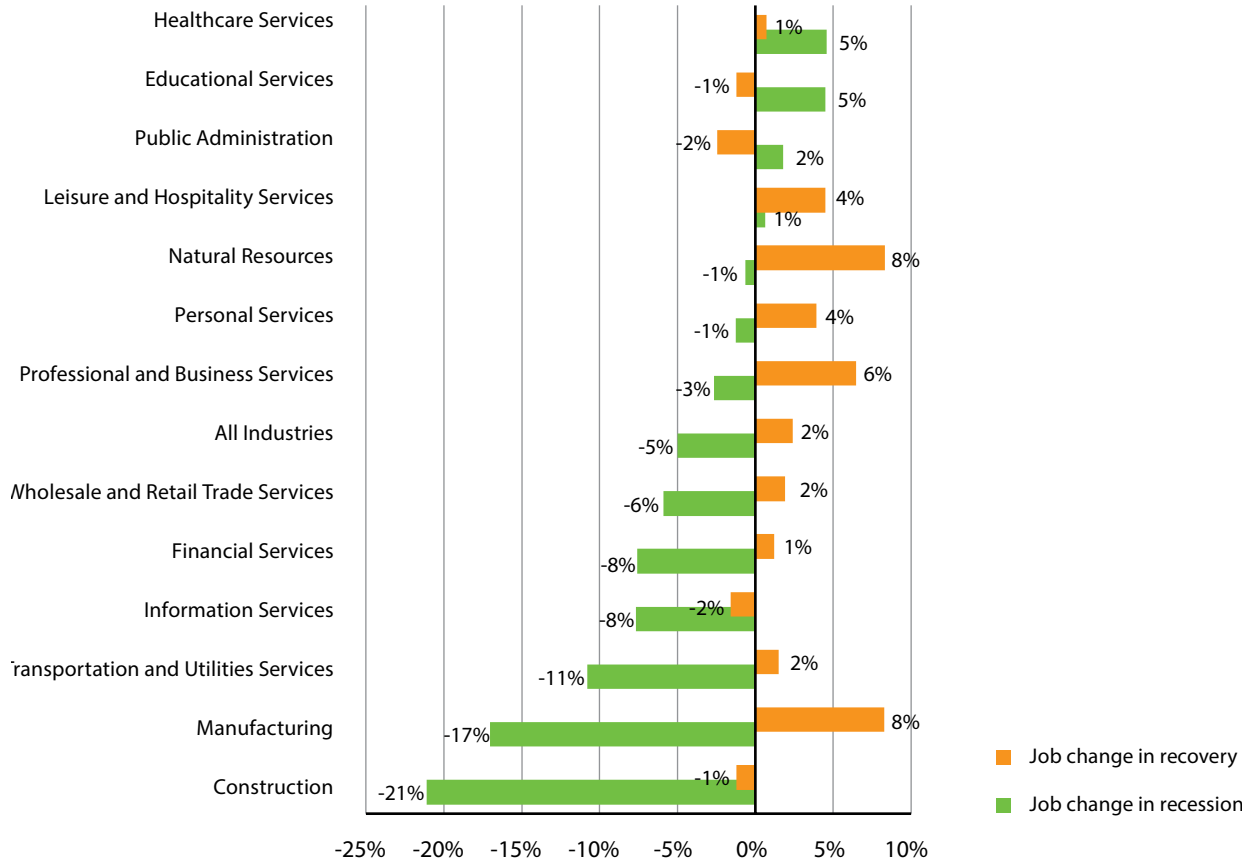
Net job change in recession and recovery



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. Percent change in both recession and recovery are from the December 2007 employment level.

FIGURE 9: Construction and information industries have had net job losses in both the recession and recovery; healthcare and leisure and hospitality had net job gains in both time periods.

Percent change in jobs over the recession and recovery



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. Percent change in both recession and recovery are from the December 2007 employment level. The graph represents the employment change over the recession since the beginning of the recession in December 2007 to January 2010 and employment change in recovery from January 2010 to February 2012.

gains made through the recession were wiped out by the budget cuts. Most of the job cuts in educational services were in public schools, making government the sector with the largest job losses in the recovery. According to the monthly Bureau of Labor Statistics' Establishment Survey, almost 90 percent of cuts in government employment came from state and local governments. The majority of job losses in the federal government were in the U.S. Postal Service and most of those workers were women. Two-thirds of those who lost jobs in the public sector (federal, state, and local) were women.

EMPLOYERS FAVORED THE MORE EDUCATED IN MOST INDUSTRIES DURING RECESSION.

As shown in Figure 1, workers with only a high school diploma or fewer years of schooling lost 5.6 million jobs due to the Great Recession while workers with a four-year college degree or more had job gains. Similarly, the large differences in job losses over the recession by educational level within industries suggest that employers have spared the educated, as shown in Table 4.

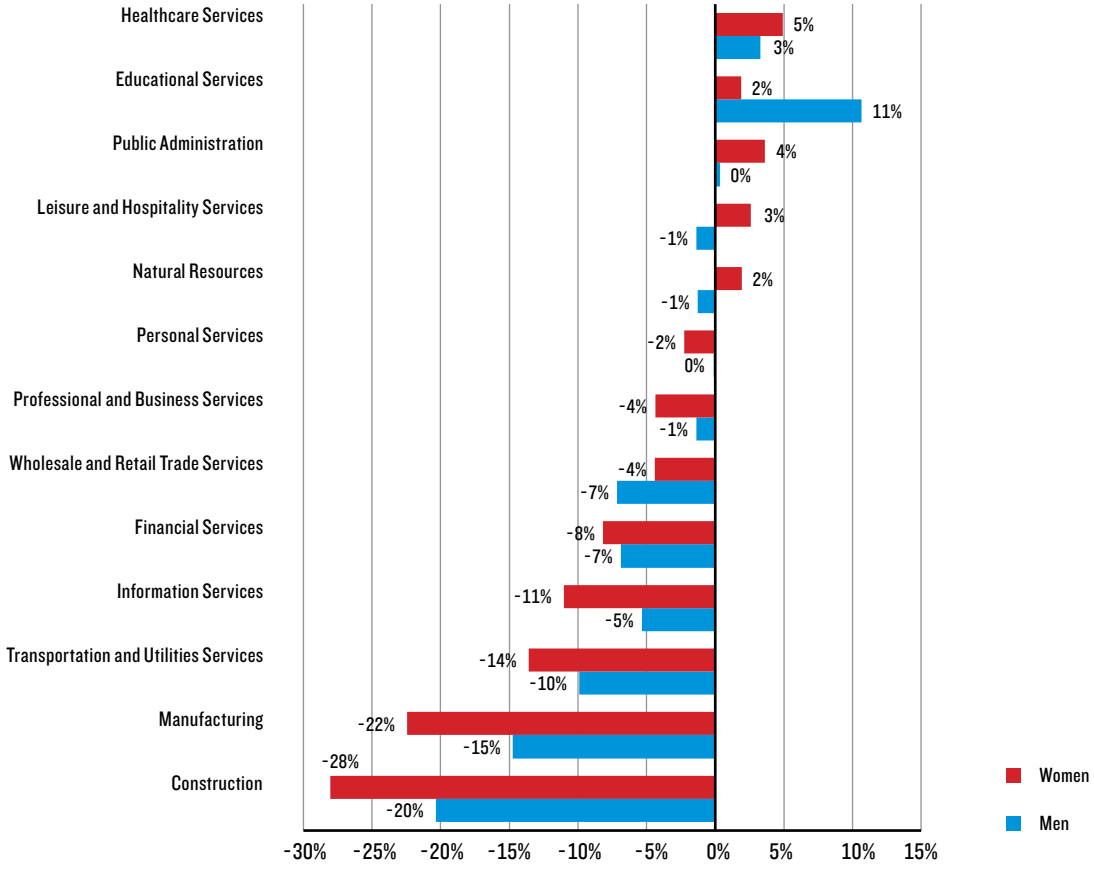
TABLE 4: The recession was harder on the less educated in every industry, except healthcare and public administration.
Percent job change over the recession by industry and education.

Major Industry Sector	% Job Change in Recession	% Change by Education			% Change by Sex	
		HS diploma or less	Some college/ AA degree	BA degree or better	Men	Women
Construction	-21%	-24%	-20%	-4%	-20%	-28%
Manufacturing	-17%	-19%	-19%	-9%	-14%	-22%
Transportation and Utilities Services	-11%	-12%	-12%	-6%	-10%	-14%
Information Services	-8%	-17%	-10%	-1%	-5%	-11%
Financial Services	-8%	-15%	-9%	-2%	-7%	-8%
Wholesale and Retail Trade Services	-6%	-8%	-5%	-1%	-7%	-4%
Professional and Business Services	-3%	-4%	-3%	-2%	-1%	-4%
Personal Services	-1%	-6%	5%	1%	0%	-2%
Natural Resources	-1%	-5%	4%	10%	-1%	2%
Leisure and Hospitality Services	1%	-4%	3%	9%	-1%	3%
Public Administration	2%	3%	-1%	3%	0%	4%
Healthcare Services	4%	4%	7%	2%	3%	5%
Educational Services (Public and Private)	5%	-3%	6%	6%	11%	2%
Total	**-5%**	**-10%**	**-4%**	**0%**	**-7%**	**-3%**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. The percentage change is as a share of total employment in December 2007. A negative sign indicates a negative change (job losses). Recession: December 2007 - January 2010.

In almost all industries, with the exception of healthcare services and public administration, better-educated workers were less likely to experience unemployment. Some even experienced job gains in a few industries like educational services, natural resources, and leisure and hospitality. Construction employment dropped only 4 percent for those with a Bachelor's degree or better, compared with 24 percent for those with a high school diploma or less. Within manufacturing, the difference is not as great but still evident; employment dropped 9 percent for those with a Bachelor's degree or better and 19 percent for those with a high school diploma or less. Within every industry except public administration and healthcare services, employment change over the recession was worse for those with a high school diploma or less.

FIGURE 10: The percentage of job losses for women were greater than for men in most industries during the recession.



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. The percentage change is as a share of total employment in December 2007. A negative sign indicates a negative change (job losses).

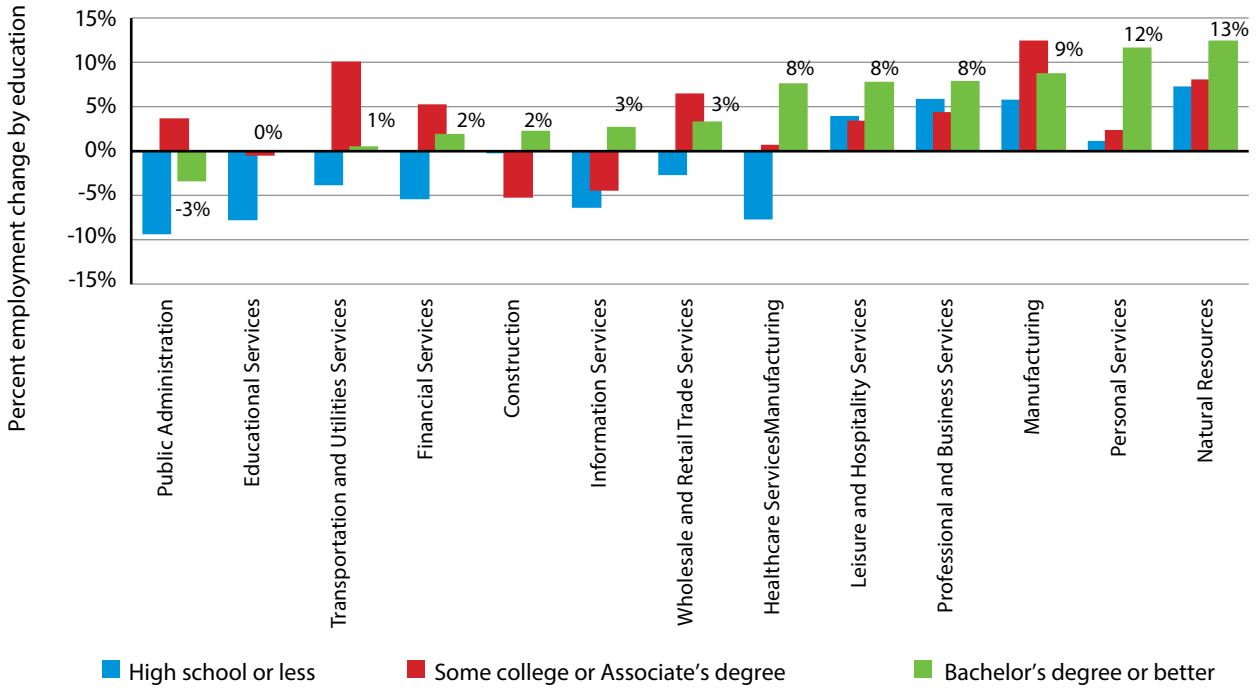
MEN LOST MORE JOBS, BUT WOMEN LOST A LARGER SHARE OF THEIR JOBS IN MOST INDUSTRIES.

Women lost a greater share of jobs than men within most industries (see Figure 10). The only exceptions were wholesale and retail trade, natural resources, and leisure and hospitality industries. Twenty-eight percent of women in construction lost their jobs, while only 20 percent of men did. In manufacturing, women lost 22 percent of their jobs while men lost 14 percent. Thus, the recession hurt women more than men, based on the percentage of jobs lost in each industry. As evident from Table 4, differences in job losses by education were greater than any losses by sex in every industry that had job losses.

NEW JOBS IN NEARLY ALL INDUSTRIES ARE DEMANDING MORE EDUCATION.

Figure 1 (on page 5) showed that job gains during the recovery did not narrow the education effect of the recession. This is also true within industries; increased demand for more education is evident in all industries except public administration (as shown in Figure 11). Leisure and hospitality employment increased 8 percent for those with a Bachelor's degree or better compared with a 6 percent increase for those with a high school diploma or less. Personal services employment increased by 12 percent for those with a Bachelor's degree or better compared with a 1 percent increase for those with a high school diploma or less. New jobs are demanding more education than before. Ap-

FIGURE 11: Demand for more education continues in the early recovery.



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. The percentage change is as a share of their employment in each industry in January 2010. A negative sign indicates a negative change (or job losses).

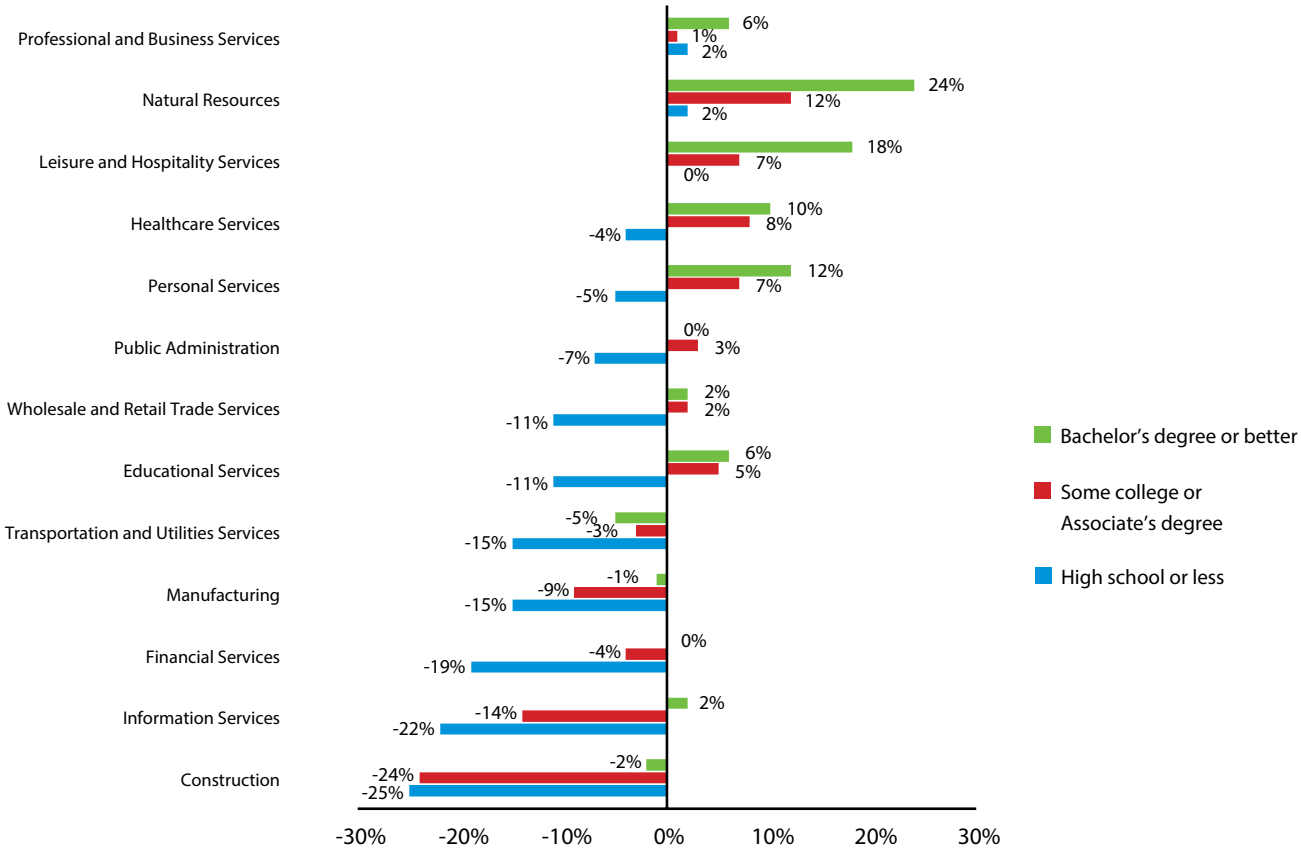
pendix Table A2 provides a detailed breakdown of employment change by industry and education in the post-recession recovery.

Traditionally, manufacturing has been a major employer of those with a high school diploma or less. The smallest employment increase during the recovery in the manufacturing industry was for workers with a high school diploma or less (6 percent). By contrast, over the past two years, there has been a 13 percent jump in the employment of those with some college education but less than a four-year college degree. In the same two years, employment of those with a Bachelor's degree or better increased by 9 percent. Not surprisingly, the combined effect of the recession and the recovery in manufacturing shows that the more educated fared better (Table 5). Manufacturing lost 15 percent of its high school or less workforce, whereas workers with a Bachelor's degree or better only lost 1 percent of jobs in manufacturing. Much of the recovery in manufacturing is in durable goods manufacturing. Fabricated metal products, machinery, transportation equipment, and motor vehicles and parts manufacturing were the biggest gainers. In nondurable goods manufacturing, job gains were made in manufacturing of plastics and rubber products, chemicals, and petroleum and coal products. Much of the losses in nondurable manufacturing was concentrated in printing-related activities and apparel manufacturing. Women mostly lost jobs in nondurable manufacturing in the recovery.

Another industry with a high concentration of less-educated workers is construction. Even as total job losses in construction continue into the recovery, the employment of workers with Bachelor's degree or better has increased by 2 percent (Figure 12). The construction industry sustained the highest losses since the beginning of the recession, losing a quarter of its high school diploma or less workforce and also nearly a quarter of its Associate's degree or some college workforce.

FIGURE 12: Both, recession and recovery, have been harder on the less educated.

Percent change in jobs over the recession and recovery



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older. The percentage change is as a share of total employment in December 2007. A negative sign indicates a negative change (job losses).

Postsecondary intensive industries, on the other hand, fared the best overall. Healthcare services gained a net of 1.2 million college jobs since the start of the recession, including 675,000 jobs for those with a Bachelor's degree or better and more than 500,000 jobs for those with some college or an Associate's degree. Educational services gained 634,000 jobs for workers with postsecondary schooling, in spite of having sustained the second highest losses during the first two years of the recovery, as states slashed education funding to deal with their budget deficits. State budget shortfalls also affected public administration, which sustained the highest losses of any industry during the past two years. Yet, since the end of 2007, public administration still gained 64,000 jobs for workers with postsecondary education. All gains came from jobs for people with some college or an Associate's degree, and the industry lost 6,000 jobs for those with a Bachelor's degree or better. Professional and business services lost 250,000 jobs for workers with postsecondary schooling during the recession, but gained over 730,000 jobs for workers with college degrees (Associate's and Bachelor's) during the recovery, for a net gain of more than 482,000 such jobs.

Job opportunities grew fastest in the natural resources industry for all education levels. Yet the pace of growth was quite different for each educational attainment level, and those differences demonstrate the advantage of college education. While the employment for individuals with a Bachelor's degree or better in the natural resources industry grew by 24 percent over the past four years, the employment for those with some college or an Associate's degree grew only half as fast, by 12 percent, and employment for those with a high school diploma or less grew by just 2 percent.

TABLE 5: Even in less-skilled, blue-collar industries—that were most devastated since the recession, such as construction and manufacturing —college-educated workers did better.

Major Industry Sector	Net Change Dec. 2007-Feb. 2012 (in thousands)			Percent Change Dec. 2007-Feb. 2012 (%)		
	High school or less	Some college/ AA degree	BA degree or better	High school or less	Some college/ AA degree	BA degree or better
Construction	-1,803	-734	-25	-25%	-24%	-2%
Educational Services	-225	126	508	-11%	5%	6%
Financial Services	-510	-135	-21	-19%	-4%	0 %
Healthcare Services	-202	514	675	-4%	8%	10%
Information Services	-194	-145	28	-22%	-14%	2%
Leisure and Hospitality Services	18	249	333	0%	7%	18%
Manufacturing	-1,187	-376	-53	-15%	-9%	-1%
Personal Services	-160	148	190	-5%	7%	12%
Natural Resources	38	80	97	2%	12%	24%
Professional and Business Services	89	29	452	2%	1%	6%
Public Administration	-111	70	-6	-7%	3%	0%
Transportation and Utilities Services	-582	-89	-78	-15%	-3%	-5%
Wholesale and Retail Trade Services	-1,012	102	99	-11%	2%	2%
Total	**-5,841**	**-160**	**2,199**	**-10%**	**0%**	**5%**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

TABLE 6: Men lost more jobs, but women lost a higher share of their employment or had slower growth in jobs than men in 10 out of 13 industry sectors.

Major Industry Sector	Net Change Dec. 2007-Feb. 2012 (in thousands)		Percent Change Dec. 2007-Feb. 2012 (%)	
	Men	Women	Men	Women
Construction	-2,292	-271	-22%	-24%
Manufacturing	-948	-667	-8%	-14%
Wholesale and Retail Trade Services	-375	-435	-3%	-5%
Transportation and Utilities Services	-520	-228	-9%	-12%
Financial Services	-165	-500	-4%	-9%
Information Services	-179	-131	-9%	-9%
Public Administration	-54	8	-1%	0%
Personal Services	135	44	4%	1%
Natural Resources	101	114	5%	20%
Educational Services	295	114	8%	1%
Professional and Business Services	517	53	6%	1%
Leisure and Hospitality Services	543	55	10%	1%
Healthcare Services	360	627	10%	4%
Total	**-2,584**	**-1,218**	**-3%**	**-2%**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

TABLE 7: Increasing numbers of men are joining previously women-dominated industries such as healthcare, financial services, and retail trade in the post-recession recovery.

Major Industry Sector	Employment in December 2007		Employment in February 2012	
	% Men	% Women	% Men	% Women
Construction	91%	9%	91%	9%
Educational Services	30%	70%	31%	69%
Financial Services	45%	55%	47%	53%
Healthcare Services	21%	79%	22%	78%
Information Services	59%	41%	59%	41%
Leisure and Hospitality Services	49%	51%	51%	49%
Manufacturing	70%	30%	71%	29%
Personal Services	47%	53%	48%	52%
Natural Resources	80%	20%	78%	22%
Professional and Business Services	58%	42%	59%	41%
Public Administration	55%	45%	55%	45%
Transportation and Utilities Services	76%	24%	77%	23%
Wholesale and Retail Trade Services	55%	45%	55%	45%
Total	**54%**	**46%**	**53%**	**47%**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

Overall, men lost 2.6 million jobs, 3 percent of their employment since the recession began (see Table 6). Women lost 1.2 million jobs, 2 percent of their employment over the recession and early recovery. Men lost the most jobs in the industries hit the worst by the recession, but women saw a higher share of their workforce wiped out. In construction men lost 2.3 million jobs, compared to 271,000 jobs lost by women in that industry. Yet that loss represented a 24 percent decrease in women's construction jobs, compared with a 22 percent decrease for men. In manufacturing, men lost 948,000 jobs, while women lost 667,000. In percentage terms, however, men lost 8 percent of their 2007 employment in manufacturing, whereas women lost 14 percent. Similarly in transportation and utilities services men lost 520,000 jobs and women lost 228,000. Nonetheless women lost a higher share, 12 percent of their transportation and utilities services workforce, compared with 9 percent for men.

Job gains for men in the recovery have been faster than for women. Overall, women gained jobs at a slower pace than men in 10 out of 13 major industry sectors, with the exceptions of information services, public administration, and natural resources. Table 7 presents the share of men and women within each industry at the beginning of the recession and today. As can be seen from Table 7, women gained in some industries and lost in others. Yet, four out of five people hired in the recovery were men. The weak recovery for women is predominantly explained by greater job losses in majority-women industries such as public administration, leisure and hospitality, and healthcare services. Both men and women lost jobs in public administration during the recovery, but men experienced fewer losses than women (see Appendix Table A2). The overwhelming number of job losses for women in the recovery was in the public sector. Since September 2011, there have been signs

that job losses for women have stabilized and that employment of women is starting to rise.

MEN WITH MORE EDUCATION ARE MAKING INROADS INTO FORMERLY WOMEN-DOMINATED INDUSTRIES.

One interesting trend in the labor market as the recovery proceeds is that men are making inroads into formerly women-dominated industries such as healthcare services and financial services. The large job losses by men during the recession may have encouraged them to explore opportunities in industries and occupations that they mostly ignored before as "women's jobs."

In 2007, only 21 percent of workers in the healthcare services industry were men. Recent job gains show men accounted for the majority of additions in healthcare and this led to the male share in healthcare going up by 1 percentage point to 22 percent (see Table 7).[16] In addition, job growth in healthcare was exclusively through gains among workers with postsecondary education, as the field continued to shed workers with a high school diploma or less (see Appendix Tables A4 and A7).

The financial industry, where women accounted for almost 55 percent of employment at the beginning of the recession, added only men in the recovery. As a result, the share of women in the industry is now down to 53 percent. Finance and insurance, credit intermediation and related activities, insurance carriers and related activities, and commercial banking made up most of the job gains, while jobs in sectors like rental and leasing services, and real estate and rental and leasing accounted for most of the losses.

Similarly, men have been hired for a larger percentage of new jobs in leisure and hospitality and wholesale and retail industries than ever before. A majority of the men added in these industries have some postsecondary education (see Appendix Tables A4 and A7).

There were 49 percent men and 51 percent women in the leisure and hospitality industry before the recession. Here, only men had net job gains in the recovery as women experienced marginal losses. This led to a reversal in the shares of men and women in the industry with the current share of men being 51 percent.

In wholesale and retail trade, men made up 55 percent of employment before the recession. Although the share has not changed, only men gained jobs in the recovery. And men hired into those jobs have had at least some college education (see Appendix Table A7).

The overwhelming number of job losses for women in the recovery was in the public sector.

Because men lost more jobs during the recession than women, it could be expected that men would be re-hired at higher rates in the recovery. Using the same rationale, the large number of jobs lost by workers with high school or less education, might lead to expectations that workers with a high school diploma or less also would be hired in large numbers as the recovery proceeds. Yet, the exact opposite is occurring—a growing number of better-educated workers have been hired for the new jobs while workers with a high school diploma or less continue to see job losses. This suggests that the jobs for workers with a high school diploma or less that were lost in the recession are gone and not coming back.

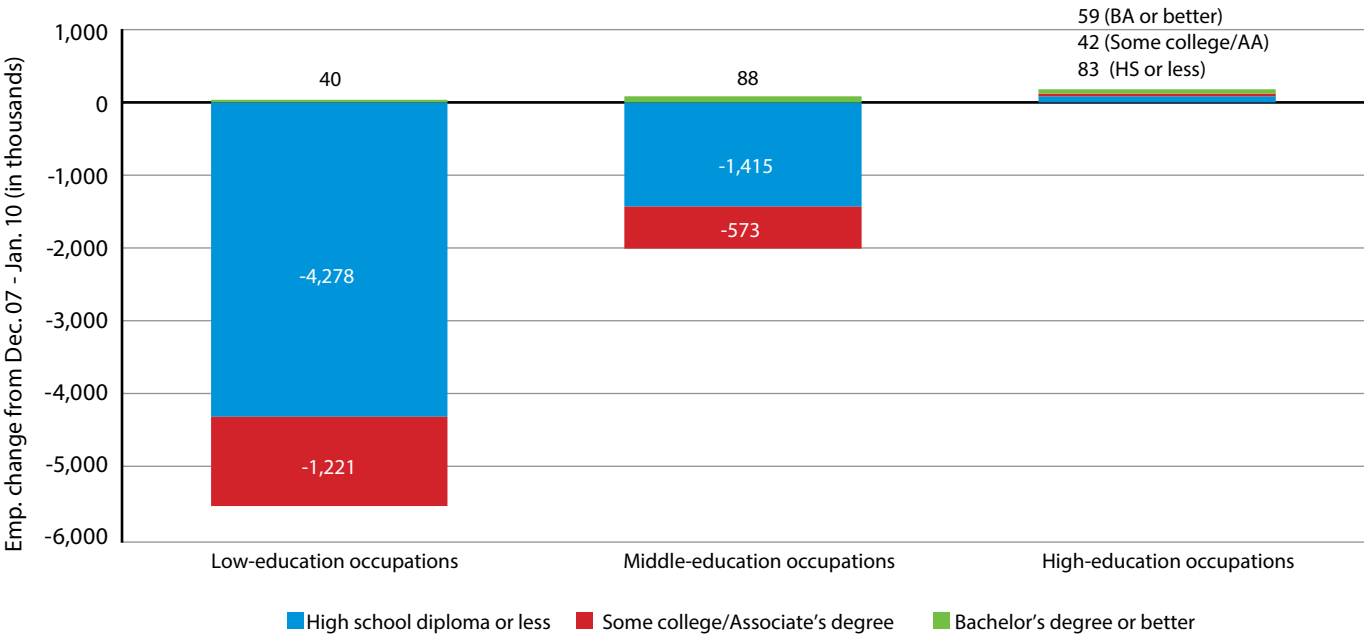
[16] The establishment survey data provide a slightly different breakdown by sex; only 41 percent of the job gains in the healthcare sector in the recovery went to men. However, this also suggests a 20 percent increase in men's participation in the healthcare sector (still, four out of every five employees in the healthcare sector are women).

THE GREAT RECESSION: OCCUPATIONAL DIFFERENCES

GREATER JOB LOSSES AMONG LOW-EDUCATION OCCUPATIONS DURING THE RECESSION

Low-education occupations (occupations in which 50 percent of workers have had no schooling beyond high school) have experience the greatest job losses in the recession.[17] Low-education occupations accounted for 5.5 million, or three-fourths, of all job losses. Yet, even in low-education occupations, educational attainment played an important role. As depicted in Figure 13, individuals with a high school diploma or less had held nearly four out of five jobs (or 4.3 million jobs) lost in low-education occupations. Those in low-education occupations who had some college education or an Associate's degree lost 1.2 million jobs. Those with a Bachelor's degree or better in low-education occupations gained more than 40,000 jobs.

FIGURE 13: Low education occupations saw greater job losses in the recession and most of them were held by the less-educated.



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

[17] Low-education occupations are installation, maintenance, and repair occupations, production occupations, food preparation and serving related occupations, transportation and material moving occupations, construction and extraction occupations, building and ground cleaning and maintenance occupations, and farming, fishing, and forestry occupations. These occupations had less than 10 percent of employees with a Bachelor's degree or better in December 2007, as shown in Appendix Table A9. High-education occupations are those with 50 percent or more of their workers with a Bachelor's degree or better. Middle-education occupations are occupations that are neither low-education nor high-education occupations.

TABLE 8: Construction and production occupations lost the most jobs over the recession, while healthcare professionals and education occupations gained jobs.

	Major Occupations	Job Change from Dec. 2007–Jan. 2010 (in thousands)			
		HS or less	Some college/AA	BA or better	Total
High Education	Management occupations	-43	-29	-277	-349
	Architecture and engineering occupations	-27	-138	-65	-229
	Business and financial operations occupations	52	-150	8	-91
	Computer and mathematical science occupations	-9	26	-50	-33
	Social science	9	-10	19	19
	Arts, design, entertainment, sports, and media occupations	13	-15	25	23
	Life, physical science occupations	12	-14	27	25
	Legal occupations	-28	24	43	39
	Community and social services occupations	10	74	-1	83
	Healthcare professional and technical occupations	131	205	31	367
	Education, training, and library occupations	-38	69	299	330
Middle Education	Office and administrative support occupations	-1,154	-627	66	-1,715
	Sales and related occupations	-396	-392	-188	-976
	Protective service occupations	63	53	93	210
	Healthcare support occupations	24	214	46	284
	Personal care and service occupations	48	179	71	297
Low Education	Construction and extraction occupations	-1,560	-532	-56	-2,148
	Production occupations	-1,393	-403	-123	-1,919
	Transportation and material moving occupations	-575	-215	5	-786
	Installation, maintenance, and repair occupations	-404	-239	77	-566
	Building and grounds cleaning and maintenance occupations	-127	33	28	-66
	Farming, fishing, and forestry occupations	-47	-6	16	-36
	Food preparation and serving related occupations	-172	140	94	62
	All occupations	**-5,611**	**-1,752**	**187**	**-7,176**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

Large losses in construction and extraction occupations and production occupations, driven by the housing market crash and the closing of manufacturing plants, led the decline of jobs in this occupational tier over the recession (see Table 8).

Middle-education occupations (those in which 50 percent to 75 percent of workers have at least some postsecondary experience) lost nearly 2 million jobs, and nearly three-fourths of them were lost by workers with high school diploma or less. The biggest job losses in middle-education occupations were in office and administrative support occupa-

TABLE 9: Low-education occupations had larger net gains in the recovery, while a few of the high-education occupations reported net job losses.

	Major Occupations	Job Change from Jan. 2010–Feb. 2012 (in thousands)			
		HS or less	Some college/AA	BA or better	Total
High Education	Management occupations	-35	64	494	523
	Business and financial operations occupations	-93	118	470	496
	Computer and mathematical science occupations	7	-9	199	197
	Arts, design, entertainment, sports, and media occupations	-23	-57	124	44
	Architecture and engineering occupations	19	-5	-2	12
	Life, physical science occupations	2	13	-11	4
	Healthcare professional and technical occupations	-125	-80	174	-31
	Legal occupations	36	-7	-83	-54
	Education, training, and library occupations	21	-14	-89	-83
	Community and social services occupations	4	-50	-58	-104
	Social science	-17	-13	-91	-122
Middle Education	Sales and related occupations	-193	395	265	468
	Personal care and service occupations	10	22	93	124
	Healthcare support occupations	-107	68	90	51
	Protective service occupations	-74	14	12	-48
	Office and administrative support occupations	-502	153	240	-109
Low Education	Production occupations	525	224	167	916
	Food preparation and serving related occupations	258	136	-40	354
	Transportation and material moving occupations	-203	409	64	270
	Building and grounds cleaning and maintenance occupations	38	138	46	222
	Installation, maintenance, and repair occupations	172	92	-99	164
	Farming, fishing, and forestry occupations	37	22	-4	55
	Construction and extraction occupations	15	-38	51	28
	All occupations	**-230**	**1,592**	**2,012**	**3,374**

Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

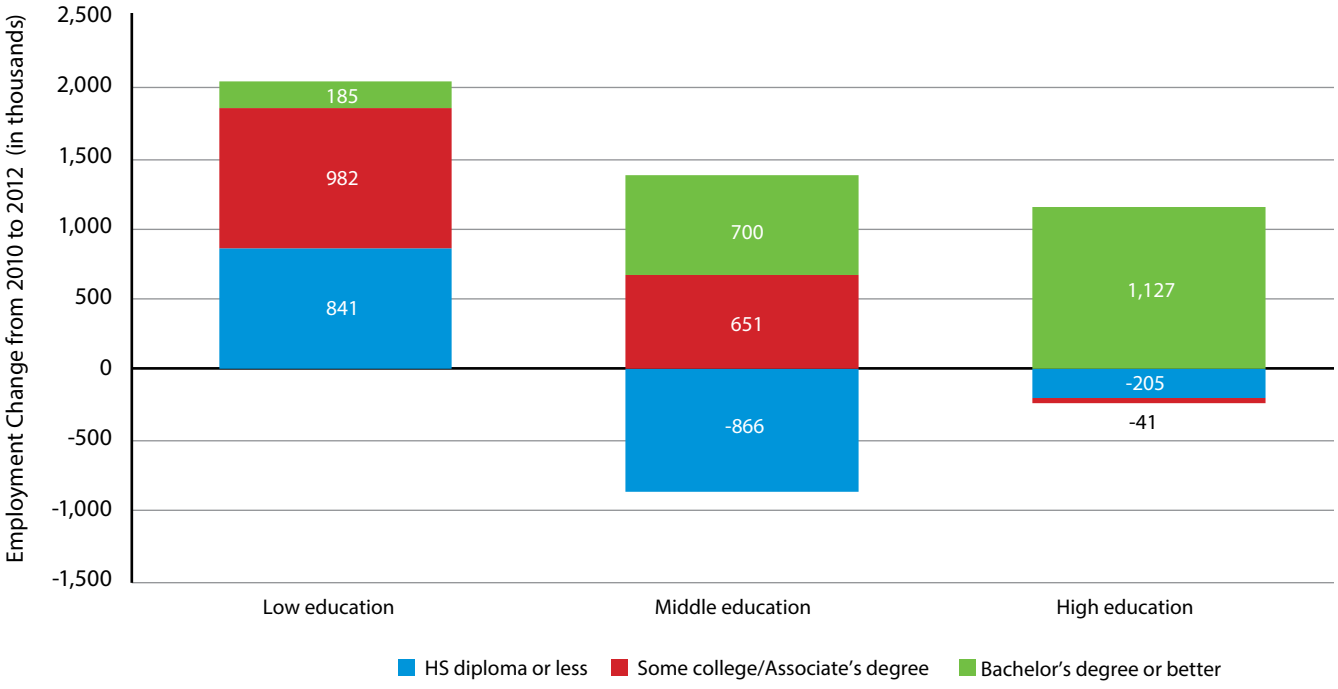
tions and sales and related occupations (see Table 8). Protective service occupations, personal service occupations, and healthcare support occupations experienced net job gains in the recession.

High-education occupations (those with 50 percent or more of their workers with a Bachelor's degree or better) experienced net gains of nearly 200,000 jobs during the recession, and 64 percent of the jobs went to people with at least some post-secondary education. Most of the job gains were in healthcare professional and technical occupations and in education, training and library occupations (see Table 8). Yet, not all high-education occupations experienced job gains; management occupations, architecture and engineering occupations, and business and financial operations occupations reported net losses during the recession as these were the occupations related to the financial crisis and the housing market crisis of the Great Recession.

THE GREATEST GAINS IN THE RECOVERY ARE IN LOW-EDUCATION FOLLOWED BY HIGH-EDUCATION OCCUPATIONS.

Although different occupations have had different employment changes during the recovery—some had losses early and then recovered, others had early gains followed by losses—most occupations reported net job gains between January 2010 and February 2012. But there were a few that had net losses (see Table 9). Production occupations, sales and related occupations, and management occupations have experienced the highest gains at each occupational tier, with each gaining nearly 500,000 or more jobs. Most occupations with net losses were high-education jobs. Social science occupations, community and social services occupations, education, training, and library occupations, and office and administrative support occupations had net losses of nearly 100,000 or more jobs each (Table 9).

FIGURE 14: Low-, middle-, and high-education occupations are all hiring more educated workers in the current economic recovery than before the recession.



Source: Authors' estimate using Current Population Survey data (2007–2012). Employment includes all workers aged 18 and older.

Low-education occupations have regained more than 2 million jobs in the recovery, accounting for about 60 percent of all net job gains, largely because manufacturing has started to bounce back and production occupations along with it (see Figure 14). Yet low-education occupations are still experiencing a deficit of more than 3 million jobs compared to employment at the beginning of the recession. In terms of educational attainment, those who were hired for the new jobs in low-education occupations are better educated than the workers who lost the jobs in those occupations, indicating that even low-education occupations are more likely to hire those with at least some post-secondary experience. Half of the job gains in the recovery in the low-education occupations went to individuals with some college or an Associate's degree. Eighty-six percent of the jobs formerly held by workers with some college or an Associate's degree in low-education occupations have been regained during the recovery.
But only 20 percent of the jobs in low-education occupations that were lost in the recession and held by workers with high school diplomas or less have been regained.

Half of the job gains in the recovery in low-education occupations went to individuals with some college or an Associate's degree.

Overall, middle-education occupations have regained less than a third of the jobs lost during the recession, or about a half million jobs. But that number can be deceiving: The middle-education occupations actually have added 1.4 million jobs that have been filled with workers with at least some postsecondary education. That is more than twice the number of jobs that workers with that level of educational attainment in the middle-education occupations lost during the recession. But their gains were eroded by the continued loss of jobs held by workers with a high school diploma or less—866,000 more such jobs were lost between January 2010 and February 2012.

High-education occupations gained nearly 900,000 jobs in the recovery; a gain of more than four times the number of job gains during the recession. Cuts in social programs and education by state and local governments faced with budget shortfalls are to blame for most of the job losses for professionals in social sciences, community and social services, and education, training and library fields, all of which are in high-education occupations. The job gains among workers with a Bachelor's degree or better are in management occupations, business and financial operations occupations, computer and mathematical occupations, and healthcare professional and technical occupations. Workers with a Bachelor's degree or better gained 1.1 million jobs in these high-education occupations during the early recovery. Employees with a high school diploma or less or some college or an Associate's degree together lost a total of 250,000 high-education

occupation jobs in the recovery (205,000 jobs were lost for those with a high school diploma or less, 41,000 jobs were lost for those with some college or an Associate's degree), reducing the net number of high-education occupation jobs gained. Thus, even high-education occupations are demanding more education in the recovery.

Evidence of increased hiring of more educated workers in low- and middle-education occupations raises a valid concern about whether the workers need more education to perform the tasks or whether workers are being "underemployed" in a slack labor market. This concern is addressed in detail in the Center on Education and the Workforce report, *The Undereducated American*. It shows, using full-time, full-year workers, that at each occupational tier, those with Bachelor's degrees earn 37 percent to 45 percent more than those with only a high school diploma. The median earnings of workers with a Bachelor's degree in low-education jobs are 37 percent more than for workers with only high school diplomas. In middle-education jobs, median earnings for those with Bachelor's degrees are 43 percent higher than for less well-educated workers. The analysis found a Bachelor's degree wage premium in jobs at all education levels. The simple fact that employers are willing to pay more for educated workers suggests that they see added benefit in such workers.

The simple fact that employers are willing to pay more for educated workers suggests that they see added benefit in such workers.

SEEKING SHELTER IN COLLEGE FROM THE GREAT RECESSION

During a weak labor market, when jobs are scarce and wages are stagnant, workers often seek to improve their training and leverage that for better employment. Delaying entry into the labor market by enrolling in postsecondary education is also a way to seek shelter until the labor market improves. Increased postsecondary enrollment tends to occur during recessions. Because of the devastating job losses during the recent recession, the increase in postsecondary enrollment was especially high.

Men seem to have understood that, as the job market continues to create more jobs that require postsecondary schooling, failure to achieve a higher education can hurt them.

An increase in postsecondary enrollment was observed in all recessions since 1980, as demonstrated in Figure 15. But the enrollment growth rate in the Great Recession was much more than in the previous recessions. The postsecondary enrollment growth rate peaked at 7 percent in 2009 compared with a high of 4.6 percent in 1980 and 4.3 percent in 2002.[18]

The U.S. Department of Education every year releases 10-year projections for college enrollment. According to the 2005 report, the projected enrollment for 2010 was 18.7 million. As depicted in Figure 16, actual enrollment in 2010 was 21 million, a 12 percent increase from what was projected in 2005. The college enrollment was projected to grow steadily to account for population growth and any general enrollment trends that existed before. Thus, the enrollment increase over and above what was projected is most likely due to the declining economic situation and the slack labor market during the recession.

GREATER INCREASE IN ENROLLMENT OF MEN IN HIGHER EDUCATION

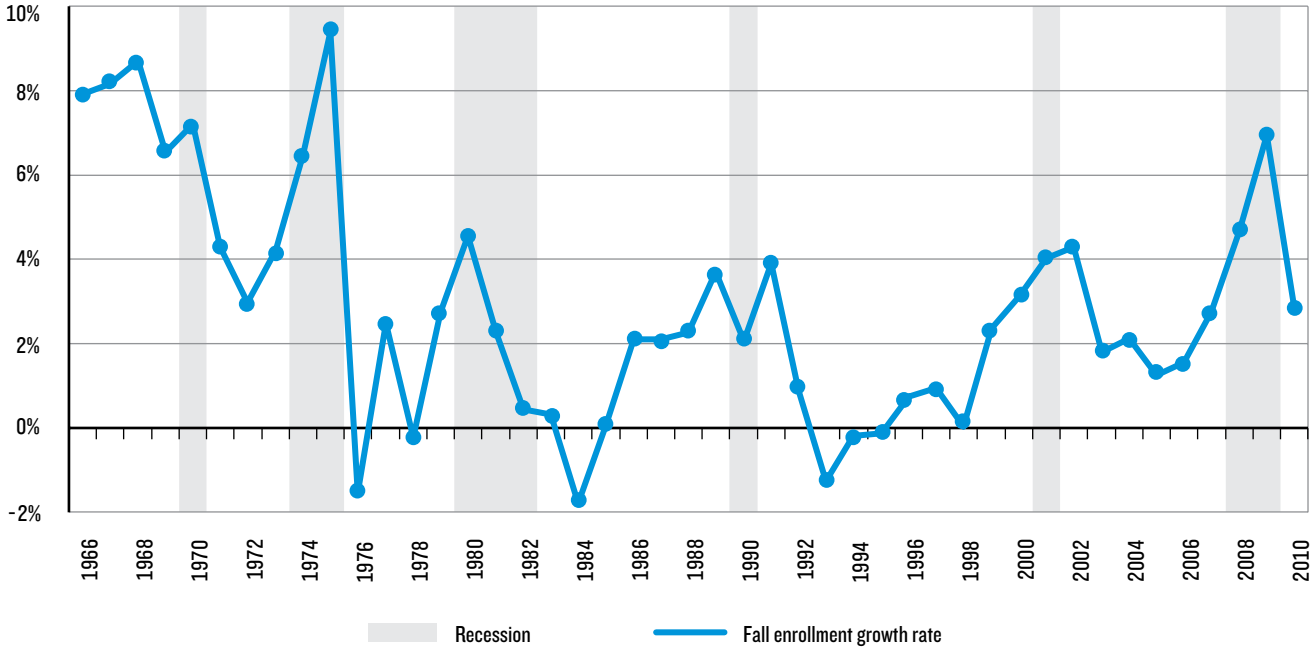
Not only were disproportionate post-recession job gains made by men, four out of five men who gained jobs had some postsecondary education. As the job market continues to create more jobs that require postsecondary schooling, failure to achieve a higher education can hurt men. Women have been far ahead in obtaining higher education since the early 1980s.[19]

There was an increase in male postsecondary enrollment in the 2001 dot-com recession as well as in the recent Great Recession, as shown in Figure 16. The most significant difference between the two recessions is that men had a marginally higher

[18] Large job losses in a recession, especially among youth, make it harder for some to afford college. Thus, job losses have a negative effect on college enrollment. At the same time, lack of job prospects reduces the "opportunity cost" of going to college or delaying graduation. [Opportunity cost is the cost of an alternative that must be forgone to pursue a certain action.] These two effects counteract each other in recessions and the final outcome depends on which effect is greater. Thus, the effect of a recession on enrollment is not always conclusive. While the institutional data suggest that there was increased enrollment, a recent study by Shierholz, et al. (May 2012) finds no evidence of an uptick in college enrollment among young high school graduates during the Great Recession. Using Current Population Survey data, they find that the "college and university enrollment rates for both men and women have not meaningfully departed from their long-term trend since the start of the Great Recession." They cite the high cost of college as the main reason for lack of a Great Recession-fueled increase in college and university enrollment.

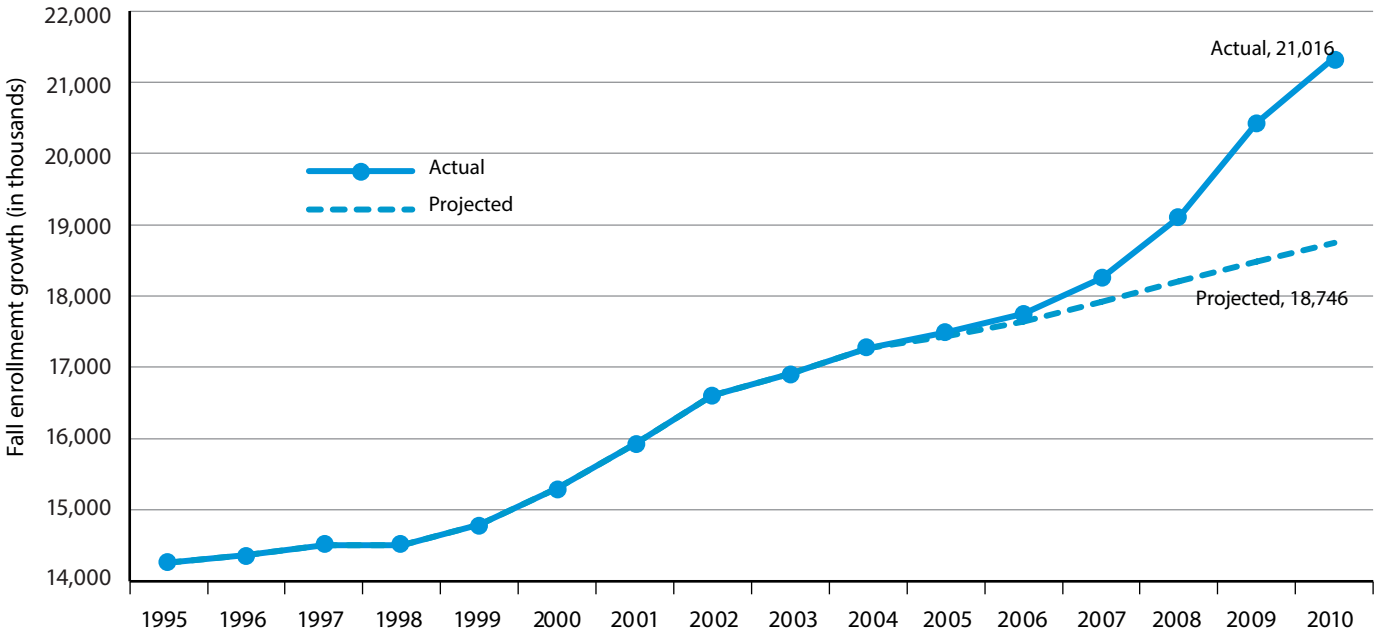
[19] http://nces.ed.gov/programs/digest/d10/tables/dt10_279.asp?referrer=report

FIGURE 15: Postsecondary enrollment skyrocketed in the recession, as potential labor market entrants sought shelter from a harsh job market.



Source: Total fall enrollment in all postsecondary degree-granting institutions is obtained from Digest of Education Statistics 2011, *published by the National Center for Education Statistics using Integrated Postsecondary Education Data System (IPEDS) data made available through the U.S. Department of Education (http://nces.ed.gov/programs/digest/d11/tables/dt11_198.asp?referrer=report).*

Figure 16: Fall 2010 enrollment in postsecondary degree-granting institutions exceeded projected enrollment by 12 percent.



Source: Total fall enrollment in all postsecondary degree-granting institutions is obtained from Digest of Education Statistics 2011, published by the National Center for Education Statistics using Integrated Postsecondary Education Data System (IPEDS) data made available through the U.S. Department of Education (http://nces.ed.gov/programs/digest/d11/tables/dt11_198.asp?referrer=report).

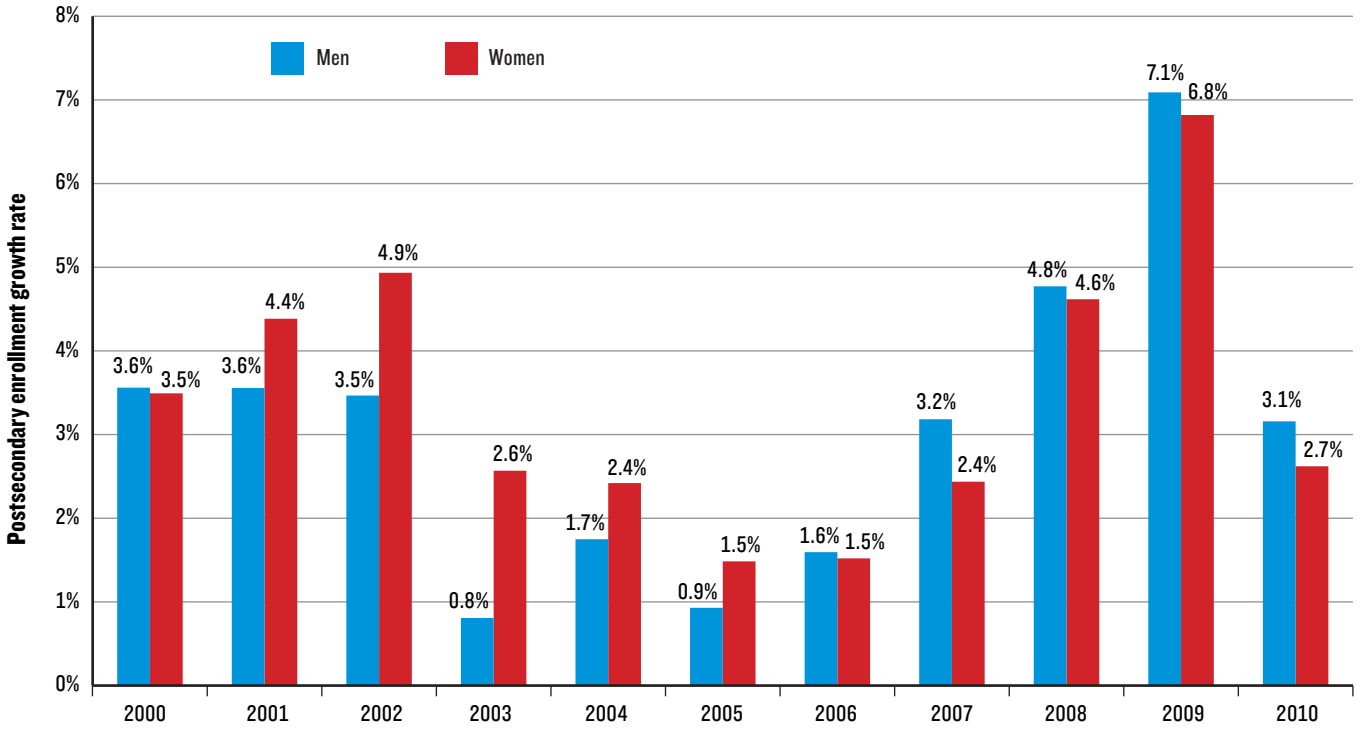
enrollment growth rate than women in this recent recession. In addition, the actual enrollment of men exceeded projected enrollment by 15 percent while enrollment of women exceeded projected enrollment by 10 percent.

Men are showing a renewed interest in higher education in fields traditionally dominated by women, such as nursing and biological and life sciences.

Not only are more men participating in women-dominated industries and being hired for jobs that demand higher levels of education, they are showing a renewed interest in higher education in fields traditionally dominated by women, such as nursing and biological and life sciences.

Women still outnumber men in college, accounting for three out of five students enrolled in four-year colleges or more advanced programs. In 2010, there were 12 million women enrolled in four-year colleges and post-graduate programs and only 9 million men enrolled in similar programs. Despite the large gap, enrollment growth rates in the latter part of the last decade, as shown in Figure 17, indicate that the rate of college enrollment for men increased considerably during and after the recession. Since the 1970s, the growth rate of enrollment for men had lagged significantly behind that of women.[20] Since 2006, college enrollment of men has grown at the same rate or at a slightly higher rate than of women. It was only in 2007 that the

FIGURE 17: Since 2006, men's enrollment in postsecondary programs has grown faster than women's.



Source: Total fall enrollment in all postsecondary degree-granting institutions is obtained from Digest of Education Statistics 2011, published by the National Center for Education Statistics using Integrated Postsecondary Education Data System (IPEDS) data of the U.S. Department of Education. (http://nces.ed.gov/programs/digest/d11/tables/dt11_198.asp?referrer=report).

[20] The college enrollment growth rate of men slightly exceeded that of women in 1982 and 2000. In 1982, men exceeded women by a percentage point and in 2000, the men's enrollment growth rate exceeded women's by one tenth of a percent.

enrollment growth rate of men became (statistically significantly) higher than that of women. Though the differences between enrollment growth rates for men and women are marginal, the changes are taking place in the right direction.

As a result, instead of a widening gap of college enrollment between men and women, enrollment levels of men and women are expected to parallel each other into the future. In order for men to catch up to the college enrollments of women in the near future, male college enrollment will have to grow at a much faster rate than it is now.

While male enrollment has grown in several fields of study such as business administration, physical sciences, and medicine, worthy of special mention is the growth in biological and life-sciences and nursing. These fields of study were formerly dominated by women. For example, women accounted for nearly 61 percent of enrollment in biological and life sciences. From 2006 to 2010, enrollment by men in these disciplines grew 28 percent while enrollment by women grew 20 percent. Over the four years, men's share of enrollment increased by 2 percentage points.

INCREASED GRADUATION RATES AMONG MEN IN WOMEN-DOMINATED FIELDS

The number of men earning a Bachelor's degree in nursing more than doubled (a growth of 110 percent) over the past five years from 4,300 to 9,000, when the number of women earning a nursing degree grew by only 62 percent (see Table 10). This is a significant increase, considering that the number of men earning a Bachelor's degree in nursing grew by 9 percent over the five years before that (from 2000 to 2005). Despite this rapid increase in the number of male nursing graduates, only one in 10 students in a nursing classroom is male.

TABLE 10: Number of men earning degrees in nursing doubled in the past five years

	Associate's Degree		Bachelor's Degree		Total	
	Men	Women	Men	Women	Men	Women
2000	4,732	38,631	3,952	36,126	8,684	74,757
2005	7,132	54,618	4,293	42,851	11,425	97,469
2010	11,256	74,429	8,998	69,560	20,254	143,989
Growth rate 2000–2005	51%	41%	9%	19%	32%	30%
Growth rate 2005–2010	58%	36%	110%	62%	77%	48%

Source: Authors' analysis of degrees conferred data obtained from Integrated Postsecondary Education Data System (IPEDS) data made available through the U.S. Department of Education.

TABLE 11: The number of men graduating in formerly women-dominated fields has been increasing since 2005

	Legal Professions and Studies		Biological and Biomedical Sciences		Psychology		Social Sciences	
	Men	Women	Men	Women	Men	Women	Men	Women
2000	24,107	26,466	32,661	44,073	22,627	71,388	73,396	77,188
2005	26,724	34,053	31,601	49,405	24,963	87,138	69,845	79,453
2010	29,011	36,121	45,406	63,433	30,088	104,349	80,249	88,207
Growth rate 2000–2005	11%	29%	-3%	12%	10%	22%	-5%	3%
Growth rate 2005–2010	9%	6%	44%	28%	21%	20%	15%	11%

Source: Authors' analysis of degrees conferred data obtained from Integrated Postsecondary Education Data System (IPEDS) data made available through the U.S. Department of Education.

The growth rate of men earning an Associate's degree or better in legal professions, biological and biomedical sciences, psychology and social sciences fields listed in Table 11 have outpaced women every year for five years, from 2006 through 2010. A growing number of men are obtaining degrees in fields formerly dominated by women.

As jobs start coming back, it is likely that the rates of growth in college enrollment will decline. Recent data suggest that the 2010 enrollment growth rate dropped to 3 percent from the peak of near 7 percent in 2009. Again, the encouraging statistic is that the male enrollment growth rate still exceeds that of women. Whether this observed post-recession trend is to stay and grow or whether it is a reaction to the dire economic and job market situation is unclear. Nevertheless, these trends are beneficial for the labor market, especially for men who have been slow to react to market signals.

CONCLUSION

At a time when college education is under attack from budget cuts and the increasing cost of college education is raising the question of whether postsecondary education is worth the money, these findings provide a compelling reason to say, yes. In jobs at every skill level and in many different occupations, the better-educated applicant has the edge. For workers, the findings point the way to acquiring the skills that the market needs and values. For students and their parents who are contemplating whether higher education is a good value, these findings make clear that the answer is a resounding yes. And for employers, the findings indicate the need to ensure that more of the workforce is prepared for higher education and that employers are willing to pay higher salaries to guarantee the workforce they need.

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APPENDIX

TABLE A1: Employment change over the recession by industry and sex, December 2007–January 2010

Major Industry Sector	Employment in Dec. 2007 (in thousands)			Job Change by Jan. 2010 (in thousands)			Percent of Job Change as a Share of Employment		
	All	Men	Women	All	Men	Women	All	Men	Women
Construction	11,691	10,581	1,110	-2,451	-2,140	-311	-21%	-20%	-28%
Manufacturing	16,338	11,453	4,885	-2,745	-1,650	-1,096	-17%	-14%	-22%
Transportation and Utilities Services	7,922	6,050	1,872	-855	-600	-254	-11%	-10%	-14%
Information Services	3,402	2,005	1,398	-261	-107	-154	-8%	-5%	-11%
Financial Services	10,316	4,655	5,662	-782	-320	-462	-8%	-7%	-8%
Wholesale and Retail Trade Services	20,273	11,159	9,114	-1,135	-734	-401	-6%	-7%	-4%
Professional and Business Services	15,632	9,049	6,582	-412	-125	-287	-3%	-1%	-4%
Personal Services	6,829	3,241	3,588	-85	-4	-81	-1%	0%	-2%
Natural Resources	2,805	2,240	565	-18	-28	11	-1%	-1%	2%
Leisure and Hospitality Services	11,578	5,643	5,935	75	-79	154	1%	-1%	3%
Public Administration	6,801	3,766	3,035	122	13	109	2%	0%	4%
Healthcare Services	17,899	3,721	14,178	799	122	678	4%	3%	5%
Educational Services	12,630	3,751	8,879	569	400	169	5%	11%	2%
Total	**144,116**	**77,315**	**66,802**	**-7,176**	**-5,250**	**-1,926**	**-5%**	**-7%**	**-3%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.

TABLE A2: Employment change over the early recovery by industry and sex, January 2010–February 2012

Major Industry Sector	Employment in Jan. 2010 (in thousands)			Job Change by Feb. 2012 (in thousands)			Percent of Job Change as a Share of Employment		
	All	Men	Women	All	Men	Women	All	Men	Women
Public Administration	6,923	3,779	3,144	-169	-67	-102	-2%	-2%	-3%
Information Services	3,141	1,898	1,243	-50	-73	23	-2%	-4%	2%
Construction	9,240	8,441	799	-112	-152	40	-1%	-2%	5%
Educational Services	13,199	4,151	9,047	-160	-106	-54	-1%	-3%	-1%
Healthcare Services	18,699	3,843	14,855	187	238	-51	1%	6%	-1%
Financial Services	9,535	4,335	5,200	117	154	-38	1%	4%	-1%
Transportation and Utilities Services	7,068	5,450	1,618	106	80	26	2%	1%	2%
Wholesale and Retail Trade Services	19,138	10,425	8,713	324	358	-34	2%	4%	0%
Personal Services	6,745	3,237	3,507	263	139	125	4%	4%	4%
Leisure and Hospitality Services	11,653	5,565	6,089	523	622	-98	4%	11%	-2%
Professional and Business Services	15,219	8,924	6,295	983	643	340	6%	7%	5%
Manufacturing	13,593	9,804	3,789	1,130	701	429	8%	7%	11%
Natural Resources	2,787	2,211	576	232	129	103	8%	6%	18%
Total	**136,940**	**72,064**	**64,876**	**3,374**	**2,666**	**708**	**2%**	**4%**	**1%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.

TABLE A3: Employment change during recession by industry and education, December 2007–January 2010 (All)

Major Industry Sector	Dec. 2007 Employment Share			Job Change from Dec. 2007 to Jan. 2010 (in thousands)				Percent Change from Dec. 2007 to Jan. 2010		
	HS	AA	BA	HS	AA	BA	Total	HS	AA	BA
Manufacturing	49%	26%	25%	-1,563	-808	-375	-2,745	-19%	-19%	-9%
Construction	63%	26%	11%	-1,789	-608	-54	-2,451	-24%	-20%	-4%
Wholesale and Retail Trade Services	47%	33%	21%	-781	-315	-39	-1,135	-8%	-5%	-1%
Transportation and Utilities Services	49%	33%	18%	-451	-319	-85	-855	-12%	-12%	-6%
Financial Services	26%	31%	43%	-388	-290	-104	-782	-15%	-9%	-2%
Professional and Business Services	28%	26%	46%	-163	-140	-110	-412	-4%	-3%	-2%
Information Services	26%	32%	43%	-147	-102	-12	-261	-17%	-10%	-1%
Personal Services	48%	29%	22%	-195	99	11	-85	-6%	5%	1%
Natural Resources	62%	23%	15%	-83	25	41	-18	-5%	4%	10%
Leisure and Hospitality Services	52%	32%	16%	-215	116	174	75	-4%	3%	9%
Public Administration	24%	35%	42%	44	-16	94	122	3%	-1%	3%
Educational Services	16%	19%	65%	-69	139	499	569	-3%	6%	6%
Healthcare Services	28%	35%	38%	189	464	146	799	4%	7%	2%
Total	**39%**	**29%**	**32%**	**-5,611**	**-1,752**	**187**	**-7,176**	**-10%**	**-4%**	**0%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.
Note:
HS: High school or less
AA: Associate's degree or some college
BA: Bachelor's degree or better

TABLE A4: Employment change in the recovery by industry and education, January 2010–February 2012 (All)

Major Industry Sector	Jan. 2010 Employment Share			Job Change from Jan. 2010 to Feb. 2012 (in thousands)				Percent Change from Jan. 2010 to Feb. 2012		
	HS	AA	BA	HS	AA	BA	Total	HS	AA	BA
Public Administration	24%	34%	42%	-154	86	-101	-169	-9%	4%	-3%
Educational Services	15%	19%	66%	-156	-13	9	-160	-8%	-1%	0%
Construction	60%	26%	13%	-14	-126	28	-112	0%	-5%	2%
Information Services	23%	31%	46%	-46	-43	40	-50	-6%	-4%	3%
Transportation and Utilities Services	45%	33%	22%	-132	230	8	106	-4%	10%	1%
Financial Services	24%	31%	46%	-122	155	83	117	-5%	5%	2%
Healthcare Services	27%	36%	37%	-392	50	529	187	-8%	1%	8%
Natural Resources	46%	31%	23%	121	54	56	232	7%	8%	13%
Personal Services	60%	24%	16%	35	49	179	263	1%	2%	12%
Wholesale and Retail Trade Services	37%	30%	33%	-231	416	139	324	-3%	7%	3%
Leisure and Hospitality Services	50%	33%	17%	233	132	158	523	4%	3%	8%
Professional and Business Services	28%	25%	47%	252	169	562	983	6%	4%	8%
Manufacturing	48%	25%	27%	376	432	322	1,130	6%	13%	9%
Total	**49%**	**32%**	**19%**	**-230**	**1,592**	**2,012**	**3,374**	**0%**	**4%**	**4%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.
Note:
HS: High school or less
AA: Associate's degree or some college
BA: Bachelor's degree or better

TABLE A5: Employment change during recession by industry and education, December 2007–January 2010 (Men)

Major Industry Sector	Dec. 2007 Employment Share			Job Change from Dec. 2007 to Jan. 2010 (in thousands)				Percent Change from Dec. 2007 to Jan. 2010		
	HS	AA	BA	HS	AA	BA	Total	HS	AA	BA
Construction	65%	25%	10%	-1,611	-526	-3	-2,140	-23%	-20%	0%
Manufacturing	48%	27%	26%	-872	-559	-218	-1,650	-16%	-18%	-7%
Wholesale and Retail Trade Services	46%	32%	22%	-423	-246	-65	-734	-8%	-7%	-3%
Transportation and Utilities Services	51%	32%	17%	-280	-247	-74	-600	-9%	-13%	-7%
Financial Services	20%	23%	57%	-159	-35	-125	-320	-17%	-3%	-5%
Professional and Business Services	28%	22%	49%	-52	-19	-55	-125	-2%	-1%	-1%
Information Services	26%	33%	41%	-88	-81	61	-107	-17%	-12%	7%
Leisure and Hospitality Services	52%	30%	18%	-127	56	-8	-79	-4%	3%	-1%
Natural Resources	66%	21%	13%	-87	29	29	-28	-6%	6%	10%
Personal Services	49%	26%	24%	-28	38	-14	-4	-2%	4%	-2%
Public Administration	21%	35%	44%	44	-24	-7	13	5%	-2%	0%
Healthcare Services	21%	25%	55%	40	73	9	122	5%	8%	0%
Educational Services	16%	18%	66%	36	92	273	400	6%	14%	11%
Total	**42%**	**27%**	**31%**	**-3,607**	**-1,449**	**-194**	**-5,250**	**-11%**	**-7%**	**-1%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.
Note:
HS: High school or less
AA: Associate's degree or some college
BA: Bachelor's degree or better

TABLE A6: Employment change during recession by industry and education, December 2007–January 2010 (Women)

Major Industry Sector	Dec. 2007 Employment Share			Job Change from Dec. 2007 to Jan. 2010 (in thousands)				Percent Change from Dec. 2007 to Jan. 2010		
	HS	AA	BA	HS	AA	BA	Total	HS	AA	BA
Manufacturing	52%	25%	23%	-691	-248	-157	-1,096	-27%	-21%	-14%
Financial Services	30%	38%	32%	-229	-254	21	-462	-13%	-12%	1%
Wholesale and Retail Trade Services	48%	34%	18%	-357	-69	25	-401	-8%	-2%	2%
Construction	41%	37%	22%	-178	-82	-51	-311	-39%	-20%	-21%
Professional and Business Services	28%	30%	42%	-112	-120	-55	-287	-6%	-6%	-2%
Transportation and Utilities Services	44%	36%	20%	-171	-71	-12	-254	-21%	-11%	-3%
Information Services	25%	30%	45%	-60	-22	-73	-154	-17%	-5%	-12%
Personal Services	47%	32%	21%	-167	61	25	-81	-10%	5%	3%
Natural Resources	46%	32%	22%	3	-4	12	11	1%	-2%	9%
Public Administration	26%	34%	40%	0	8	101	109	0%	1%	8%
Leisure and Hospitality Services	52%	33%	14%	-88	60	182	154	-3%	3%	21%
Educational Services	17%	20%	64%	-105	48	226	169	-7%	3%	4%
Healthcare Services	29%	38%	33%	149	391	137	678	4%	7%	3%
Total	**35%**	**32%**	**33%**	**-2,004**	**-303**	**381**	**-1,926**	**-8%**	**-1%**	**2%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.
Note:
HS: High school or less
AA: Associate's degree or some college
BA: Bachelor's degree or better

TABLE A7: Employment change in the recovery by industry and education, January 2010–February 2012 (Men)

Major Industry Sector	Jan. 2010 Employment Share			Job Change from Jan. 2010 to Feb. 2012 (in thousands)				Percent Change from Jan. 2010 to Feb. 2012		
	HS	AA	BA	HS	AA	BA	Total	HS	AA	BA
Construction	63%	25%	12%	-47	-94	-11	-152	-1%	-4%	-1%
Educational Services	15%	18%	67%	-82	-3	-21	-106	-13%	0%	-1%
Information Services	22%	30%	47%	10	-16	-67	-73	2%	-3%	-8%
Public Administration	22%	34%	43%	-89	37	-16	-67	-10%	3%	-1%
Transportation and Utilities Services	45%	32%	23%	-164	193	52	80	-6%	11%	5%
Natural Resources	48%	28%	24%	55	31	43	129	4%	6%	14%
Personal Services	63%	23%	14%	48	40	50	139	3%	4%	6%
Financial Services	18%	24%	59%	31	43	80	154	4%	4%	3%
Healthcare Services	21%	26%	53%	-5	178	64	238	-1%	18%	3%
Wholesale and Retail Trade Services	40%	27%	33%	-79	384	53	358	-2%	12%	2%
Leisure and Hospitality Services	50%	32%	18%	201	249	172	622	7%	14%	17%
Professional and Business Services	28%	23%	49%	259	69	315	643	10%	3%	7%
Manufacturing	47%	25%	28%	249	335	118	701	5%	13%	4%
Total	**51%**	**31%**	**18%**	**388**	**1,446**	**833**	**2,666**	**1%**	**7%**	**4%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.
Note:
HS: High school or less
AA: Associate's degree or some college
BA: Bachelor's degree or better

TABLE A8: Employment change in the recovery by industry and education, January 2010–February 2012 (Women)

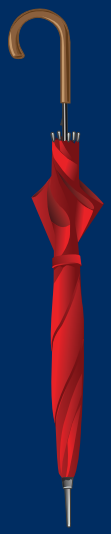
Major Industry Sector	Jan. 2010 Employment Share			Job Change from Jan. 2010 to Feb. 2012 (in thousands)				Percent Change from Jan. 2010 to Feb. 2012		
	HS	AA	BA	HS	AA	BA	Total	HS	AA	BA
Public Administration	25%	33%	42%	-65	49	-85	-102	-8%	5%	-7%
Leisure and Hospitality Services	50%	34%	17%	32	-117	-14	-98	1%	-6%	-1%
Educational Services	15%	20%	65%	-74	-11	30	-54	-5%	-1%	1%
Healthcare Services	29%	38%	33%	-387	-128	464	-51	-9%	-2%	10%
Financial Services	29%	36%	35%	-153	112	3	-38	-10%	6%	0%
Wholesale and Retail Trade Services	33%	32%	34%	-152	33	85	-34	-4%	1%	5%
Information Services	24%	32%	45%	-56	-27	107	23	-19%	-7%	19%
Transportation and Utilities Services	46%	35%	19%	33	37	-44	26	5%	6%	-12%
Construction	35%	41%	24%	33	-32	39	40	12%	-10%	20%
Natural Resources	44%	35%	22%	66	24	13	103	25%	14%	10%
Personal Services	46%	30%	24%	-14	9	129	125	-1%	1%	17%
Professional and Business Services	28%	29%	43%	-6	100	246	340	0%	5%	9%
Manufacturing	49%	25%	26%	127	97	204	429	7%	10%	21%
Total	**40%**	**37%**	**23%**	**-617**	**146**	**1,179**	**708**	**-3%**	**1%**	**5%**

Source: Authors' estimate using the Current Population Surveys 2007–2012. Employment includes all workers aged 18 and older.
Note:
HS: High school or less
AA: Associate's degree or some college
BA: Bachelor's degree or better

TABLE A9: Employment by occupation and education, December 2007

	Major Occupation Group	Employment in December 2007		
		HS or less	Some college/AA	BA or better
High Education	Social science	2%	10%	88%
	Legal occupations	8%	14%	78%
	Life, physical science occupations	7%	15%	78%
	Education, training, and library occupations	9%	14%	77%
	Community and social services occupations	10%	17%	73%
	Computer and mathematical science occupations	8%	25%	67%
	Architecture and engineering occupations	9%	26%	65%
	Business and financial operations occupations	12%	25%	63%
	Healthcare professional and technical occupations	7%	34%	59%
	Arts, design, entertainment, sports, and media occupations	14%	28%	58%
	Management occupations	22%	25%	53%
Middle Education	Sales and related occupations	38%	34%	28%
	Protective service occupations	32%	45%	23%
	Office and administrative support occupations	41%	41%	18%
	Personal care and service occupations	48%	37%	15%
	Healthcare support occupations	47%	43%	10%
Low Education	Production occupations	67%	25%	8%
	Installation, maintenance, and repair occupations	55%	37%	8%
	Food preparation and serving related occupations	61%	31%	8%
	Transportation and material moving occupations	68%	25%	7%
	Construction and extraction occupations	70%	24%	6%
	Building and grounds cleaning and maintenance occupations	75%	19%	6%
	Farming, fishing, and forestry occupations	80%	15%	5%
	Total	**39%**	**29%**	**32%**

Source: Authors' estimate using Current Population Survey data (2007–2012).



The College Advantage comprises a full report and an executive summary. Both can be accessed at cew.georgetown.edu/collegeadvantage.

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