McKinsey&Company

McKinsey Global Institute

June 2011

An economy that works: Job creation and America's future

The McKinsey Global Institute

The McKinsey Global Institute (MGI), established in 1990, is McKinsey & Company's business and economics research arm.

MGI's mission is to help leaders in the commercial, public, and social sectors develop a deeper understanding of the evolution of the global economy and to provide a fact base that contributes to decision making on critical management and policy issues.

MGI research combines two disciplines: economics and management. Economists often have limited access to the practical problems facing senior managers, while senior managers often lack the time and incentive to look beyond their own industry to the larger issues of the global economy. By integrating these perspectives, MGI is able to gain insights into the microeconomic underpinnings of the long-term macroeconomic trends affecting business strategy and policy making. For nearly two decades, MGI has utilized this "micro-to-macro" approach in research covering more than 20 countries and 30 industry sectors.

MGI's current research agenda focuses on three broad areas: productivity, competitiveness, and growth; the evolution of global financial markets; and the economic impact of technology. Recent research has examined a program of reform to bolster growth and renewal in Europe and the United States through accelerated productivity growth; Africa's economic potential; debt and deleveraging and the end of cheap capital; the impact of multinational companies on the US economy; technology-enabled business trends; urbanization in India and China; and the competitiveness of sectors and industrial policy.

MGI is led by three McKinsey & Company directors: Richard Dobbs, James Manyika, and Charles Roxburgh. Susan Lund serves as MGI's director of research. MGI project teams are led by a group of senior fellows and include consultants from McKinsey's offices around the world. These teams draw on McKinsey's global network of industry and management experts and partners. In addition, MGI works with leading economists, including Nobel laureates, who act as advisers to MGI projects.

The partners of McKinsey & Company fund MGI's research, which is not commissioned by any business, government, or other institution.

Further information about MGI and copies of MGI's published reports can be found at www.mckinsey.com/mgi.

Copyright © McKinsey & Company 2011

McKinsey Global Institute

June 2011

An economy that works: Job creation and America's future

James Manyika
Susan Lund
Byron Auguste
Lenny Mendonca
Tim Welsh
Sreenivas Ramaswamy

Preface

In the wake of the 2008 recession, it has become clear that the pattern of job creation in the United States has shifted. Building on our previous work on US labor markets and economic renewal, the McKinsey Global Institute (MGI) undertook the research in this report to more fully understand the employment challenge.

The primary thrust of our inquiry has been to determine the causes of slow job creation in the period before the recession and the implications for future job growth. We project how the US labor force will evolve over the next ten years and create different scenarios for job growth based on extensive analysis of sector trends. Our central finding is that a return to full employment will require not only a robust economic recovery but also a concerted effort to address the institutional and structural factors that have weakened job creation. We offer a range of possible solutions that we hope will add to the national conversation.

MGI leaders Susan Lund and James Manyika, together with McKinsey directors Byron Auguste, Lenny Mendonca, and Tim Welsh, led the effort. Sreenivas Ramaswamy managed the project team, which included Imran Ahmed, Jonathan Keller, Megan McDonald, James Montupet, Jennifer Smith, and John Snidow. Other members of MGI Economics Research provided valuable assistance. Geoffrey Lewis provided excellent editorial support. We thank the MGI communications and operations organization—Tim Beacom, Deadra Henderson, Julie Philpot, and Rebeca Robboy—for their many contributions. We also thank our MGI colleagues Michael Chui, Richard Dobbs, Jan Mischke, Jaana Remes, Charles Roxburgh, and Fraser Thompson for their input to this project.

Distinguished academic experts provided valuable perspectives and advice. We wish to thank Orley C. Ashenfelter, Joseph Douglas Green 1895 Professor of Economics at Princeton University; Martin N. Baily, Bernard L. Schwartz Chair in Economic Policy Development at the Brookings Institution; Lawrence F. Katz, Elisabeth Allison Professor of Economics at Harvard University; and Laura D. Tyson, S. K. and Angela Chan Chair in Global Management at the Haas School of Management, University of California at Berkeley.

This work also benefited from the generous assistance of business leaders, government officials, and other experts in the field. These include Gus Faucher and Sophia Koropeckyj of Moody's Analytics; Dean Garfield of the Information Technology Industry Council; Sallie Glickman, Shannon Hansen, Tammy Johns, and Dominique Turcq of Manpower Incorporated; Parminder Jassal of the Bill and Melinda Gates Foundation; Charles Kolb of the Committee for Economic Development; Gad Levanon and Bart van Ark of the Conference Board; Andrew Stern, president emeritus of the Service Employees International Union; and Betsey Stevenson, chief economist at the US Department of Labor.

We are grateful to many McKinsey colleagues who contributed their time and expertise to the project: Michael Coxon, Janet Crawford, Tyler Duvall, Alan FitzGerald, Neel Gandhi, Bowen Garrett, Biniam Gebre, Bryan Hancock,

Mike Hatch, John Horn, Paul Kihn, Nancy Killefer, Bob Kocher, Martha Laboissière, Badal Malick, Gary Moe, Eugene Nho, Daniel Pacthod, Aditya Pande, Andrew Ross, Johnny Russ, Arvind Sohoni, Bob Sternfels, Humayun Tai, and Justin Webb.

Finally, we offer special thanks to the 17 human resources executives interviewed during this project. Their insights into US labor markets and prospects for job growth illuminated our research and enhanced our understanding. We interviewed them on the condition that we would not identify them or their companies. All references to specific companies in this report come from public sources.

This is the third in a series of reports on US growth and renewal, a multiyear effort by the McKinsey Global Institute. We would like to thank members of the steering committee of that broader effort for their valuable guidance: Byron Auguste, Doug Haynes, David Hunt, Vikram Malhotra, James Manyika, Lenny Mendonca, Scott Nyquist, Gary Pinkus, Vivian Riefberg, and Tim Welsh. The previous reports in the series are *Growth and competitiveness in the United States: The role of its multinational companies* and *Growth and renewal in the United States: Retooling America's economic engine*. These reports are available at www.mckinsey.com/mgi.

Our aspiration is to provide facts and analyses to better understand some of the most important trends shaping the global economy, industry, and society today. We hope our findings enhance the dialogue on solutions for job creation among businesses, policy makers, and other leaders. As with all MGI projects, this research is independent and has not been commissioned or sponsored by any business, government, or other institution.

Richard Dobbs
Director, McKinsey Global Institute
Seoul

James Manyika
Director, McKinsey Global Institute
San Francisco

Charles Roxburgh
Director, McKinsey Global Institute
London

Susan Lund
Director of Research, McKinsey Global Institute
Washington, DC

June 2011

The jobs picture in 2011

7 million
Decline in the number of US jobs since December 2007

60 months
Projected length of "jobless recovery"

1 in 10
The number of Americans who move annually, down from 1 in 5 in 1985

20%
Proportion of men in the population not working today, up from 7% in 1970

23%
Drop in rate of new business creation since 2007, resulting in as many as 1.8 million fewer jobs

. . . and the challenges ahead

21 million
Jobs needed by 2020 to return to full employment

9.3–22.5 million
Range of jobs created in low- and high-job-growth scenarios

1.5 million
Estimated shortage of college graduates in the workforce in 2020

40%
Proportion of companies planning to hire that have had openings for 6 months

58%
Employers who say that they will hire more temporary and part-time workers

Contents

Executive summary 1

1. Jobless recoveries: The new normal? 9

2. Wanted: 21 million jobs 21

3. America's evolving workforce: Investing in a national asset 35

4. Anytime, anywhere: The changing nature of work 45

5. Toward a US jobs agenda 55

Appendix A. Technical notes 61

Appendix B. Business leader interviews and survey results 75

Bibliography 83

Executive summary

The United States faces an immediate challenge: finding employment for 7 million people still out of work from the 2008–09 recession and reviving robust job creation in the decade to come. But simply employing a nation's people is not enough. In a globalized, information-age economy, there is no more important economic priority than building a strong workforce.

To understand how America might meet these challenges, the McKinsey Global Institute launched a research project that combines extensive sector analysis, interviews with human resource executives, a proprietary survey of business leaders, and our own scenario analysis and modeling. We sought to shed new light on how companies use labor, where new jobs are likely to come from, and what conditions are needed to ensure robust and sustainable job creation.

The results of our analysis are sobering: only in the most optimistic scenario will the United States return to full employment[1] before 2020. Achieving this outcome will require sustained demand growth, rising US competitiveness in the global economy, and better matching of US workers to jobs. Among our key findings:

- The United States has been experiencing increasingly lengthy "jobless recoveries" from recessions in the past two decades. It took roughly 6 months for employment to recover to its prerecession level after each postwar recession through the 1980s, but it took 15 months after the 1990–91 recession and 39 months after the 2001 recession. At the recent pace of job creation, it will take more than 60 months after GDP reached its prerecession level in December 2010 for employment to recover.[2]

- The United States will need to create a total of 21 million new jobs in this decade to put unemployed Americans back to work and to employ its growing population. We created three possible scenarios for job creation, based on sector analyses, and find that they deliver from 9.3 million to 22.5 million jobs. Only in the high-job-growth scenario will the United States return to full employment in this decade.

- Six sectors illustrate the potential for job growth in this decade: health care, business services, leisure and hospitality, construction, manufacturing, and retail. These sectors span a wide range of job types, skills, and growth dynamics. They account for 66 percent of employment today, and we project that they will account for up to 85 percent of new jobs created through the end of the decade.

1 In this report we refer to full employment as 5 percent unemployment, roughly what the US economy experienced before this recession. We do not take a view on what the natural rate of unemployment will be in the future.

2 This calculation is based on total net job creation of 117,000 jobs per month, the average from January through April 2011, using data from the Current Population Survey. The widely publicized monthly payroll job creation figures are higher, but they exclude self-employed workers.

- Under current trends, the United States will not have enough workers with the right education and training to fill the skill profiles of the jobs likely to be created. Our analysis suggests a shortage of up to 1.5 million workers with bachelor's degrees or higher in 2020. At the same time, nearly 6 million Americans without a high school diploma are likely to be without a job.

- Moreover, too few Americans who attend college and vocational schools choose fields of study that will give them the specific skills that employers are seeking. Our interviews point to potential shortages in many occupations, such as nutritionists, welders, and nurse's aides—in addition to the often-predicted shortfall in computer specialists and engineers.

- The nature of work is changing in ways that present both opportunities and challenges. Ubiquitous digital communications and advanced information systems enable employers to disaggregate jobs into specialized tasks, which can then be performed remotely. This facilitates rapid growth in part-time and contingent employment and is also enabling companies to bring back some services jobs from abroad.

Given these challenges, the United States will not return to full employment by simply following a "business as usual" course. A robust economic recovery will be essential to attain high job growth in the future, but it will not be sufficient by itself. To reverse the recent pattern of slow job growth, businesses, government leaders, educational institutions, and workers themselves will need the courage to consider bold new approaches and must work together for such approaches to succeed.

Our research indicates that progress on four dimensions is needed: ensuring that the workforce acquires skills needed for the jobs that will be in demand; finding ways for US workers to win "share" in the global economy; encouraging innovation, new business creation, and the scaling up of industries in the United States; and removing unnecessary impediments that slow business investment and job creation.

JOBLESS RECOVERIES: THE NEW NORMAL?

The jobless recovery phenomenon of the past 20 years is a symptom of several deeper changes (Exhibit E1). One is the relentless efforts of globally competitive companies to improve efficiency. In classic cyclical recessions, companies sacrificed some productivity and profitability until demand returned; today, they respond to downturns primarily by reducing employment. In our survey of 2,000 business executives, 65 percent reported their companies have made operational changes to improve productivity and reduce employment in the past three years.[3]

Jobless recoveries also highlight difficulties in matching workers with jobs. Layoffs today are more likely than in the past to be permanent, and many new jobs created in recoveries emerge in different industries and occupations from where jobs were lost. Displaced workers without transferable skills face increasingly lengthy job searches. And because of the aging of the population, higher rates of home ownership, and the rise of dual-career families, Americans today are much less willing or able to move for a job than they were in the past.

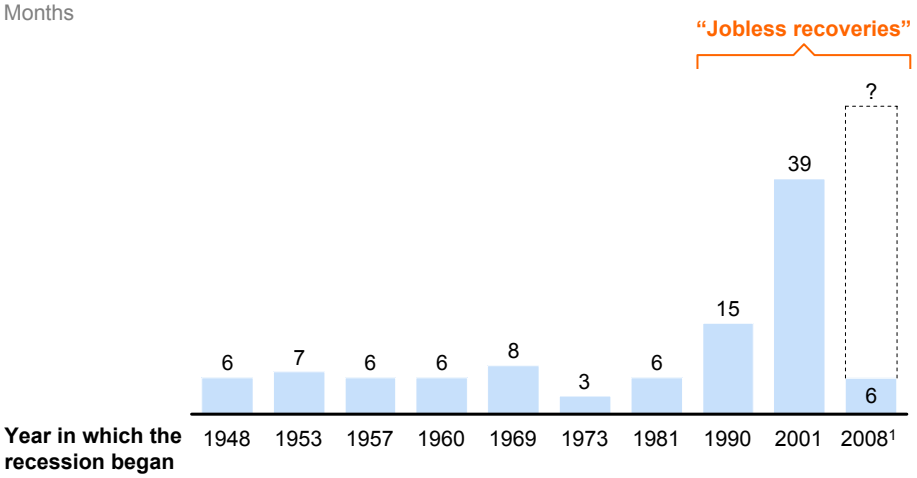
3 See Appendix B of this report for more detail on the business survey results.

Exhibit E1

Jobless recoveries: The time lag between GDP recovery and employment recovery has been increasing

Lag from when real GDP returns to prerecession peak to when employment returns to prerecession peak

Months



1 The National Bureau of Economic Research estimates that the recession began in December 2007. GDP returned to its prerecession peak in December 2010.

SOURCE: US Bureau of Labor Statistics; US Bureau of Economic Analysis; McKinsey Global Institute analysis

The jobless recovery that is now unfolding also reflects a slow rate of new business creation, which fell 23 percent between 2007 and 2010, more than in past recessions. Even before that, the number of employees per new business had been falling, from eight in the 1990s to fewer than six in recent years. Had new businesses been launched at the prerecession rate, we calculate that the United States would have had 1.8 million more jobs by the end of 2010.[4]

The problems of US job creation are not restricted to periods of recession and recovery. Between 2000 and 2007, the United States posted a weaker record of job creation than during any decade since the Great Depression. Total employment from 2000 to 2007 increased by 9.2 million—less than half the rate of increase of preceding decades—and 1.2 million of those jobs were in sectors directly fueled by the credit bubble. The question now is whether this is the "new normal" or whether the economy can return to the job creation rate it experienced before 2000.

Weak job creation and jobless recoveries have negative effects on individual workers, their families, communities, the overall quality of the labor force—and, inevitably, on society. An extended period of unemployment measurably lowers health outcomes and lifetime earnings; a worker who returns to work after long-term unemployment will earn 20 percent less over the next 15 to 20 years than a worker who was continuously employed.[5]

4 This calculation assumes roughly 7 employees in each new business; the average size of new businesses for the period 1995–2000.

5 See Louis S. Jacobson, Robert J. LaLonde, and Daniel G. Sullivan, *The costs of worker dislocation* (Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, 1993); see also Till von Wachter, Jae Song, and Joyce Manchester, *Long-term earnings losses due to mass layoffs during the 1982 recession*, Columbia University, Department of Economics discussion paper, 0708-16, 2009.

WANTED: 21 MILLION JOBS

To return to prerecession employment levels by 2020 and accommodate the new entrants into the labor force, the United States will need to create 21 million net new jobs in this decade. To understand how this might be achieved, we created three scenarios of sector job growth, using our survey data, interviews with companies, and macroeconomic forecasts of sector demand.

In the most optimistic scenario, 22.5 million new jobs could be created by 2020, returning the economy to a 5 percent rate of unemployment by 2018. However, in the low-job-growth scenario, only 9.3 million net new jobs are added—implying continued levels of high unemployment. In our midrange scenario, about 17 million jobs would be created, with the unemployment rate remaining at nearly 7 percent in 2020 (Exhibit E2).

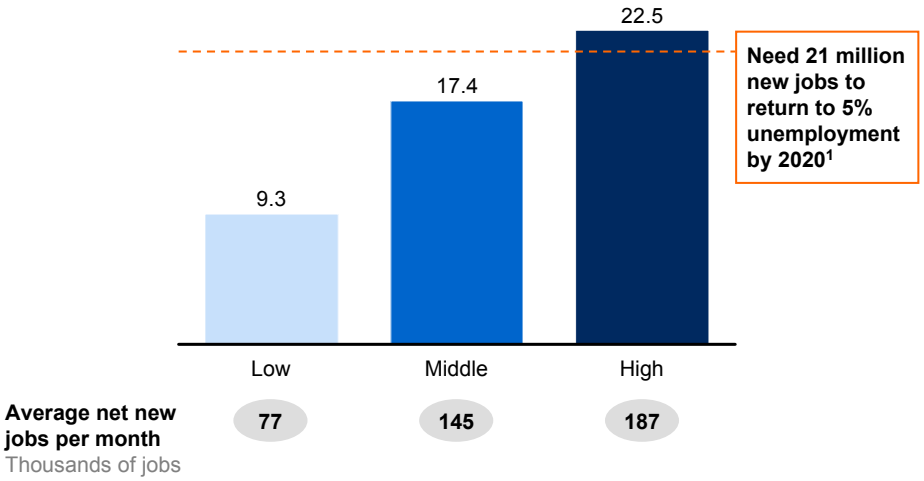
The low-job-growth scenario is frighteningly familiar. Essentially, it would be a continuation of the weak US job creation trend since 2000. It would mean further contraction in manufacturing employment, a continued wave of automation and offshoring in administrative and back-office positions, and a new wave of automation in retail (for instance, more widespread adoption of self-checkout). As in the past decade, our projections show that college graduates would fill a disproportionate share of whatever jobs would be created. Where the scenario would diverge from the past decade is in health care, in which large efficiency gains or significant cost controls unaccompanied by job-creating innovation could slow rates of job growth.

Achieving the high-job-growth scenario will require strong performance in several sectors of the economy. Health care is pivotal, with the potential to create more than 5 million new jobs. This would stem from rising demand from the aging population and the addition of millions of newly insured Americans to the health care system. The scenario also assumes that innovative approaches in primary care, chronic disease management, and geriatric care would create new jobs.

Exhibit E2

The high-job-growth scenario is the only one that returns the United States to 5 percent unemployment by 2020

Employment demand scenarios
2020, millions of jobs



1 Based on our labor force supply projections discussed in Chapter 3 of this report.
SOURCE: Moody's Analytics; McKinsey Global Institute analysis

Slowing the rate of manufacturing job losses since 2000 will also be critical in the high-job-growth scenario. Business services, a category that includes everything from facilities support to architectural services, could create nearly 6 million more jobs. This will depend on preserving employment in administrative support and other functions that many companies have outsourced, often to locations outside the United States. A rebound in housing and consumer demand could add a total of 3 million jobs in construction and retail. Leisure and hospitality would perform best with strong growth in both domestic travel and foreign tourism.

Highly educated Americans see job growth in all scenarios, but only under the high-job-growth scenario does employment grow significantly for workers with less than a college degree. This scenario also offers the possibility that the United States can start to reverse two decades of "hollowing out" middle-income jobs, which are essential for social mobility.[6]

AMERICA'S EVOLVING WORKFORCE: INVESTING IN A NATIONAL ASSET

Despite an aging population, in this decade the US labor force will continue to grow, reaching 168.9 million in 2020, from 153.8 million at the end of 2010, according to our projections.

However, the configuration of the labor force will not neatly fit the requirements of employers. While company executives in interviews expressed enthusiasm for the strength and productivity of the US workforce, they also indicated a strong need for workers with specific skills and educational requirements—which may be lacking in the labor force of 2020, absent changes in policies and institutions.

We project that 56.5 million members of the workforce in 2020—or about 34 percent—will have college or graduate degrees. However, if the high-job-growth scenario is achieved, there will still be 1.5 million too few college graduates (Exhibit E3). Moreover, in 2020, some 38 percent of US workers—or 64 million—will have a high school diploma or less. We project there will be 5.9 million more high school dropouts in 2020 than jobs available for workers with that level of education.

A growing source of potential matching problems among workers with postsecondary education is the fields of study they choose. Many are not obtaining the skills that will be most in demand. Extrapolating from the current trend, in this decade the United States will produce twice as many graduates in social sciences and business as in science, technology, engineering, and mathematics (the STEM fields)—exacerbating the shortage of qualified candidates for technical jobs reported in our employer survey. Shortages are also likely in some health care categories and in a number of specific vocations that students in community colleges and vocational schools could be training for. In our survey, 64 percent of companies reported having positions for which they often cannot find qualified applicants, with management, scientists, and computer engineers topping the list.

In general, workers of all ages need better information on which to base their educational and training decisions. A national database, showing which jobs are in demand locally and nationally, could be a great help. Similarly, a system to certify

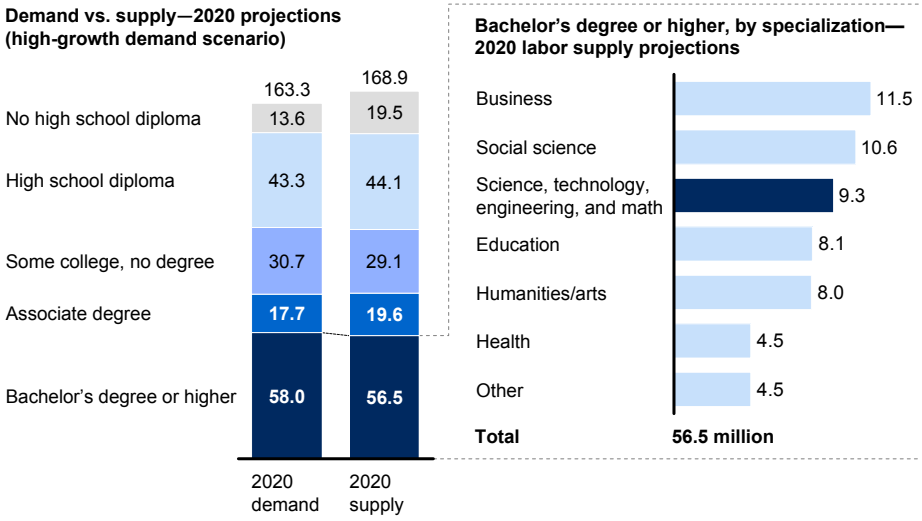
6 See David Autor, *The polarization of job opportunities in the U.S. labor market*, Center for American Progress (The Hamilton Project), April 2010; see also Claudia Goldin and Lawrence Katz, "Long-run changes in the wage structure: Narrowing, widening, polarizing," *Brookings Papers on Economic Activity*, Volume 38, Issue 2, 2007.

the skills of employees in many kinds of jobs, reflecting both formal education and on-the-job training, could make matching far easier.

Exhibit E3

Labor demand and supply projections indicate 1.5 million too few college graduates in 2020

Million



SOURCE: US Bureau of Labor Statistics; Anthony Carnevale, Nicole Smith, and Jeff Strohl, *Help wanted: Projections of jobs and education requirements through 2018*, 2010; McKinsey Global Institute analysis

ANYTIME, ANYWHERE: THE CHANGING NATURE OF WORK

As the United States replaces the jobs lost by the recession, many workers will confront an evolving employment landscape. Thanks to broadband communications and other technologies, more work can be done remotely and more jobs can be "disaggregated" into different tasks.

Disaggregation means separating simple repetitive tasks from more complex, interactive jobs and then either automating them or assigning them to lower-cost workers. Sometimes, disaggregation can lead to the creation of new middle-income jobs, too. One example: using other health care workers to offload from physicians those tasks that require time and attention rather than advanced skills.

The growing sophistication of communications technology makes it possible for people to work anytime, anywhere. This virtualization of jobs is opening up new opportunities for Americans to work from home or from remote centers in lower-cost parts of the country. As a result, some companies are moving jobs back from offshore locations, a trend we think could gain steam if more businesses had better information about the opportunities. "Home-sourcing"—people working from home for call center or administrative work—could be the best prospect for many laid-off workers who cannot sell their homes or move.

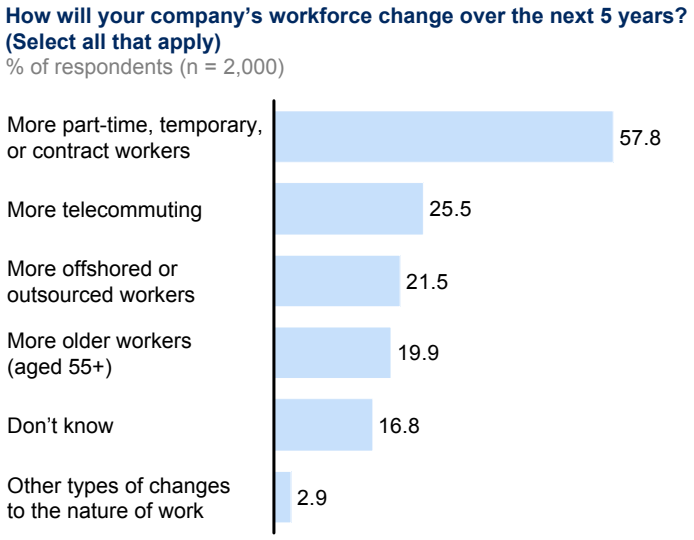
Finally, technology makes it possible for companies to manage labor as a variable input rather than a fixed one. Using new resource-scheduling systems, they can staff workers only when needed—whether it's for a full day or a few hours. In our survey, more than half of employers expected to use more part-time, temporary, and contingent workers in the years ahead (Exhibit E4). This trend is driven partly by concerns over the strength of the current recovery, but many employers say they will

continue to employ contingent workers for flexibility and to better use their permanent workforces.

For high-skill employees and professionals, the ability to set their own hours and work from any location can be liberating and empowering. Indeed, employers are using remote work to attract and retain some types of employees, including mothers and people nearing retirement. At the same time, workers who shuttle from one part-time job to another as they piece together a full-time paycheck will be outside the traditional employer-based benefits system.

Exhibit E4

Our survey reveals that employers foresee a more flexible and virtual labor force



SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

TOWARD A US JOBS AGENDA

While a robust economic recovery is a foundation for job growth, a cyclical rebound in GDP growth alone is unlikely to put enough Americans back to work. Job creation must become a national priority, not a by-product of other policy decisions. Our research indicates that progress on four dimensions is needed: addressing the growing skill mismatch problem; finding ways to make globalization a better source of job creation in the United States; stimulating innovation and new company creation; and simplifying regulatory procedures that create obstacles to job creation. We present a range of possible solutions in these four areas, which we hope will advance the conversation about growth and jobs.

- **Skill: Develop the workforce of tomorrow.** Despite rising educational attainment and large investments by the federal government in education and job training, employers say they cannot find workers with specific skills. Meanwhile, students lack a clear picture of which jobs to prepare themselves for. Businesses can become more involved in developing curricula in community colleges and vocational schools, and a national jobs database could provide the basis for informed decisions about majors and training programs. Targeting federal scholarships and loans for students pursuing education in technical fields can reduce potential shortages in areas such as software design. Policy makers can also learn from successful job retraining and placement models in other nations.

- **Share: Harness globalization to create more US jobs.** Despite the recent financial crisis, the global economy is booming, and for the most part American companies have adapted and thrived. However, the same cannot be said for American workers. The United States needs to ensure that its workers—not just its companies—win "share" in the global marketplace. One way is to increase foreign direct investment in the United States, particularly investment into job-creating "greenfield" investment projects. At the same time, the United States can do a better job of encouraging exports by smaller companies. Another promising new trend that should be encouraged is repatriating some types of services that have been offshored; shifting economics will make it more competitively attractive to locate many remote business services jobs in the United States.

- **Spark: Grow emerging industries and new businesses and reignite innovation.** Innovation, new industries, and new company creation are essential for strong demand growth and job creation. An important first step will be to restart the flow of financing to start-ups and growing young companies. Adopting some existing state-level models to encourage angel and venture capital would be a good step, for both new companies and established players. Government can also use its influence as a standards setter and buyer of equipment to help accelerate the development of new technologies and industries. Finally, government, academia, and the private sector should collaborate on ways to make sure that more new ideas developed by US companies and in American research labs scale up into industries in the United States.

- **Speed: Clear the path for investing and hiring.** Uncertainty over the direction of regulation—and the time and expense required to comply with current regulation—has made some companies hesitant to invest. Speeding the resolution of investment decisions, too often delayed by overlapping or conflicting environmental and land use regulations or by their unnecessarily slow application, is critical. "Plug and play" enterprise zones, which would be preapproved for most zoning and environmental permits, could cut in half the time needed to bring a new plant online. Another critical obstacle to job growth is the backlog at the US Patent Office, where it can take more than three years to get approval. Finally, there are some regulations in fields such as medicine or shipping that needlessly restrict how services can be delivered and by whom.

□ □ □

Waiting for the US job market to correct itself and depending on the solutions of the past will not hasten the return to full employment or set the stage for sustained job creation in the years to come. To create the jobs that America needs to continue growing and to remain competitive, leaders in government, business, and education will have to be creative—and willing to consider solutions they have not tried before. Workers themselves will need to acquire the right skills and to adapt to a future of lifelong learning and new ways of working. As Peter Drucker warned, "The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic."

1. Jobless recoveries: The new normal?

During the postwar period, recessions and recoveries were mostly matters of business cycles. When demand recovered and GDP growth resumed, employers hired again. The relationship between economic recoveries and employment recoveries was predictable. But for the past two decades, this pattern has been broken.

Now, recessions have become periods of accelerated structural change—"jobless recoveries" that result in years, not just months, of unemployment. For affected workers, this leads to lower long-term earnings, more limited job opportunities, and even poorer health outcomes. Jobless recoveries also place a significant burden on society, potentially expanding the pool of difficult-to-employ people.

There are many reasons for the jobless recovery now unfolding in the United States, including the changing responses to recessions by employers, problems matching displaced workers to jobs, and the slow growth of new enterprises. However, problems in US job creation were evident before the 2008 recession began. Indeed, in the years from 2000 to 2007, the United States recorded its weakest employment growth for any comparable period since the Great Depression.

The question now is whether this weak job growth will be the "new normal" or whether the United States can reverse the two-decade trend to generate robust and sustainable employment growth in the years to come. Addressing the underlying structural causes of jobless recoveries will be critical in determining the answer.

PRELUDE TO THE JOBLESS RECOVERY

In the 2008 recession, the percentage decline in employment was twice as large as in all previous postwar recessions (Exhibit 1), with 8.4 million jobs lost from peak to trough.[7] By December 2010, the economy was recovering, but 7.2 million fewer people were unemployed.

As in past recessions, job losses were greatest in the groups with chronically high unemployment: the unskilled, the young, and the minorities. The unemployment rate for Americans with only high school diplomas stood at 4.7 percent in December 2007 and at 9.8 percent at the end of 2010. Unemployment among high school dropouts hit 15 percent. The unemployment rate for black men jumped the most of all racial groups, by 9.4 percentage points to 17.3 percent. Although Americans of all age groups suffered in this recession, the young were hit the hardest: in December 2010, the youth unemployment rate stood at 18 percent.

This pattern of job loss was seen across industries. In all sectors (except education, government, and health care, which added jobs), people with the least training bore the brunt of layoffs (Exhibit 2). At the end of 2010, 78 percent of Americans who were unemployed had no postsecondary education, while the unemployment rate for those with college educations or graduate degrees was 4.8 percent.

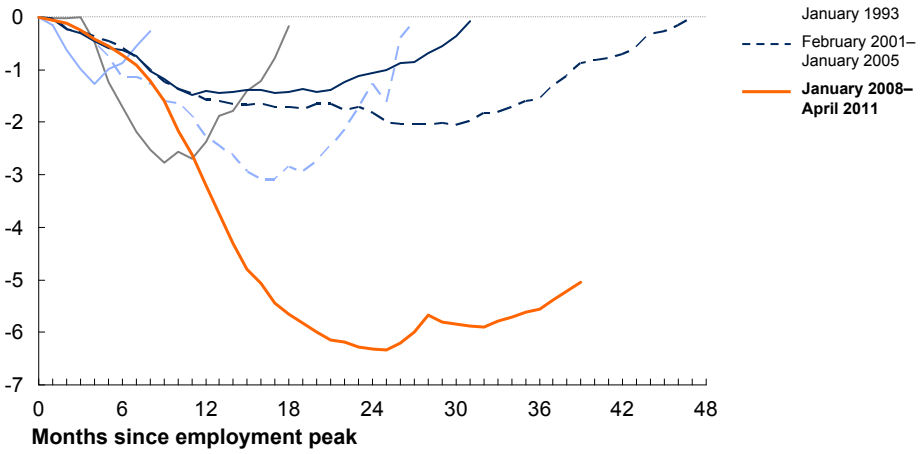
7 The unemployment rate peaked at 10.1 percent for workers 16 years of age and older in October 2009.

Of all sectors, manufacturing had the greatest numerical losses, shedding more than 2 million payroll jobs. Sectors where employment swelled along with the real estate bubble suffered disproportionately; the unemployment rate for construction workers in late 2010, for example, was 21 percent—the highest for any industry.

Exhibit 1

The US employment decline in this recession was more than twice as large as in previous postwar recessions

US employment decline from peak[1]
%

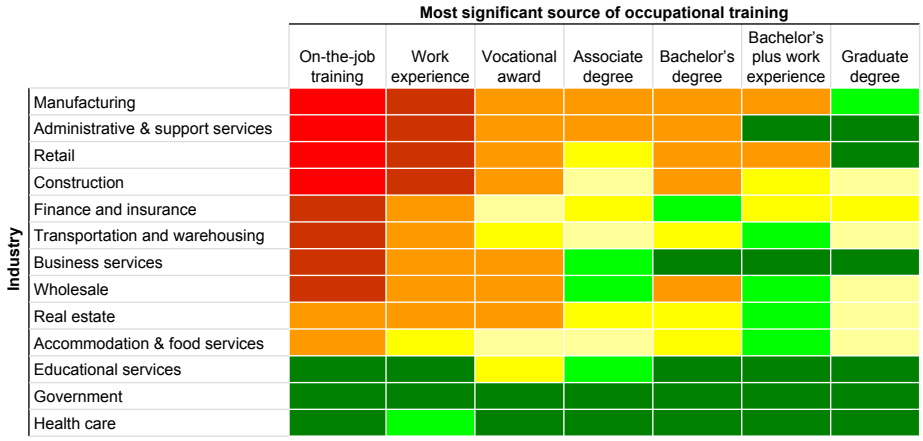


1 Total nonfarm employment, seasonally adjusted.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit 2

Low-skill occupations had the highest job losses in all sectors

Annual net employment change, 2007–09[1]
Thousands of jobs



1 Calculated using US Bureau of Labor Statistics Occupational Employment Statistics data, which do not include farm, self-employed, or new entrants to the labor market.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Men were particularly hard hit in this recession, accelerating a disturbing trend of prime working-age males leaving the labor force. From 1950 to 1970, 93 percent of prime working-age men (25 to 54 years) were gainfully employed. By 2010, that share had dropped to 80 percent, indicating that one in five prime working-age men are not working; more than half of this decline occurred between 2007 and 2010. The reasons for this decline are not fully understood: some young men are high school dropouts who never entered the labor force (or have worked only outside the formal economy); some are "discouraged" former members of the labor force; and some are incarcerated.

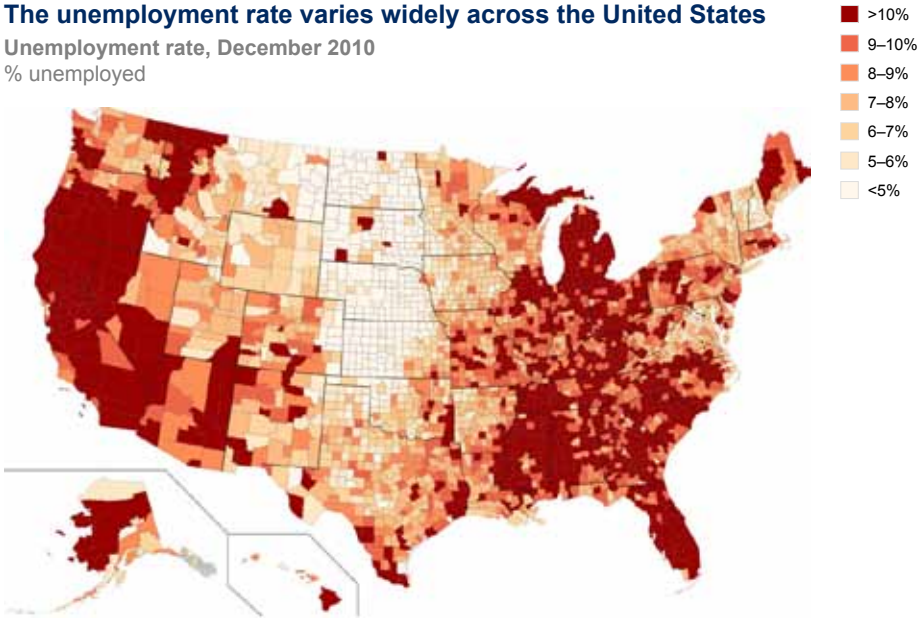
Job losses in the recession also varied significantly across the nation (Exhibit 3). Unemployment in 2010 exceeded 12 percent in California, Nevada, Florida, and Michigan and was highest in counties that are heavily dependent on manufacturing, in poor rural counties, and in those that felt the brunt of the real estate collapse (see Box 1, "Regional disparities in unemployment"). Policies to promote job creation will therefore need to be tailored to specific local circumstances.

Hiring has picked up since late 2010, but the pattern of job creation does not point to either a rapid return to full employment or the emergence of a job market that will put displaced, low-skill workers back in comparable positions. On average, the economy has created 130,000[8] net new jobs per month since March 2010—fewer than the 166,000 jobs per month after the 2001 recession and the 210,000 jobs per month after the 1982 recession. At this rate, the United States appears to be in for an uncomfortably long period of high unemployment.

Exhibit 3

The unemployment rate varies widely across the United States

Unemployment rate, December 2010
% unemployed



SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

8 This calculation is based on net job creation of 117,000 jobs per month, the average from January through April 2011, using data from the Current Population Survey by the Bureau of Labor Statistics. Note that this figure is for total job creation; the rate of payroll job creation was higher, but the number of self-employed jobs declined over this period, reducing the total.

Box 1. Regional disparities in unemployment

Similar to past recessions, the extent of unemployment in this latest recession and recovery has been widely disparate across states, counties, and cities. At the end of 2010, a year after the end of the downturn, the unemployment rate in the most severely affected state—Nevada—was 14 percent, a full 10 percentage points higher than in the least affected state, North Dakota. A swath of relatively low unemployment stretched down the middle of the country, from Montana and North Dakota to Texas. The most affected states were concentrated in the west and southeast of the country, plus Michigan. Three states—California, Florida, and Michigan—accounted for one-third of all job losses, despite having only 21 percent of the workforce.

A closer look reveals that three types of counties were disproportionately affected: those with large manufacturing bases; those that experienced the largest housing bubbles; and rural, chronically poor counties.[1] In 2010, these three types of counties had year-end unemployment rates of 10.6, 10.0, and 12.0 percent, respectively—compared with 8.4 percent for all other counties. These counties will require different policy interventions to spur job creation, given the unique structural factors underpinning their employment problems.

The regional unemployment story played out similarly in cities. Metropolitan areas with the lowest unemployment rates, among them Bismarck and Fargo in North Dakota, were in the least-affected states. All but four of the 25 metropolitan areas with the highest unemployment rates were in California, Nevada, Florida, or Michigan. The five large metropolitan areas—having populations of 1 million more—with the highest unemployment rates were Las Vegas, Riverside (California), Detroit, Sacramento, and Tampa.

1 We define manufacturing counties as those in which more than 30 percent of employment in 2007 was in manufacturing. Housing bust counties are those in which home prices appreciated more than 175 percent between 2000 and 2007. Rural, chronically poor counties are those that have a rural-urban continuum score greater than 4 and had greater than 25 percent poverty rates in 1999. The rural-urban continuum score, defined by the US Department of Agriculture, defines counties on a continuum based on population and adjacency to metropolitan areas. Counties scoring more than 4 have urban populations below 20,000 or are not adjacent to any metro area.

HOW JOBLESS RECOVERIES UNFOLD

From the end of World War II until the 1990–91 recession, there was a tight link between recovery in GDP and recovery in employment. About six months after economic output returned to its prerecession high, employment would follow (Exhibit 4). That pattern ended after 1991, when it took 15 months for employment to return to prerecession levels. After the 2001 recession, it took 39 months. At recent rates of total job creation, it could take until mid-2016 for the United States to return to its prerecession level of employment—more than 60 months after GDP returned to its prerecession level in December 2010.

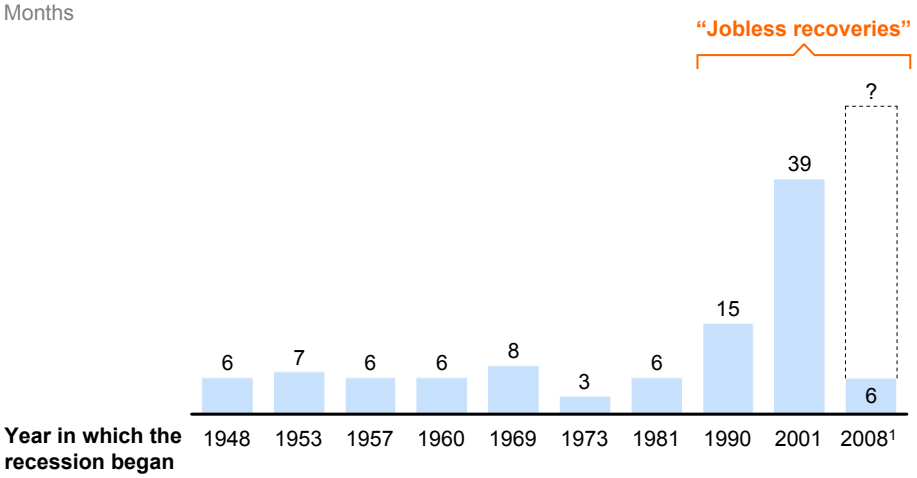
The jobless recovery phenomenon arises from three factors that reflect changes both in the economy and in how companies engage (and disengage) labor.

Exhibit 4

The time lag between GDP recovery and employment recovery has been increasing

Lag from when real GDP returns to prerecession peak to when employment returns to prerecession peak

Months



1 The National Bureau of Economic Research estimates that the recession began in December 2007. GDP returned to its prerecession peak in December 2010.

SOURCE: US Bureau of Labor Statistics; US Bureau of Economic Analysis; McKinsey Global Institute analysis

The relentless pursuit of efficiency

In the 1960s and 1970s, many economists considered employees "quasi-fixed" assets of firms.[9] Because a company had invested in training and employees amassed firm-specific knowledge, management tried to keep them on the payroll during slow periods so it could restore output quickly when demand picked up. So, until the 1990s, companies muddled through recessions by trimming labor costs somewhat—reducing hours or using temporary layoffs. They accepted that productivity declines were a natural consequence of a downturn as output per worker fell.[10]

In today's globally competitive environment, companies increasingly seek to preserve productivity and profitability at the expense of employment. During the 1973 recession, reduced employment constituted one-third of every percentage point decline in GDP; productivity loss made up the remaining two-thirds. In every subsequent downturn, a growing portion of the decline was borne by employment, so that by the most recent recession, employment absorbed 98 percent of the decline in GDP (Exhibit 5). Economist Robert Gordon characterizes this shift as the rise of "the disposable worker."[11]

9 See Walter Oi, "Labor as a quasi-fixed factor," *The Journal of Political Economy*, Volume 70, Number 6, December 1962.

10 This relationship is described by an empirical observation known as "Okun's Law" and named for economist Arthur Okun. Okun originally proposed that for every 3 percent decrease in GDP, there would be a corresponding 1 percent increase in unemployment, a 0.5 percent decrease in labor force participation, a 0.5 percent decrease in hours worked per worker, and a 1 percent decrease in productivity (output per worker). See Arthur M. Okun, *Potential GNP: Its measurement and significance*, 1962 Proceedings of the Business and Economic Statistics Section of the American Statistical Association.

11 See Robert Gordon, "Okun's law and productivity innovations," *American Economic Review*, Volume 100, Number 2, May 2010.

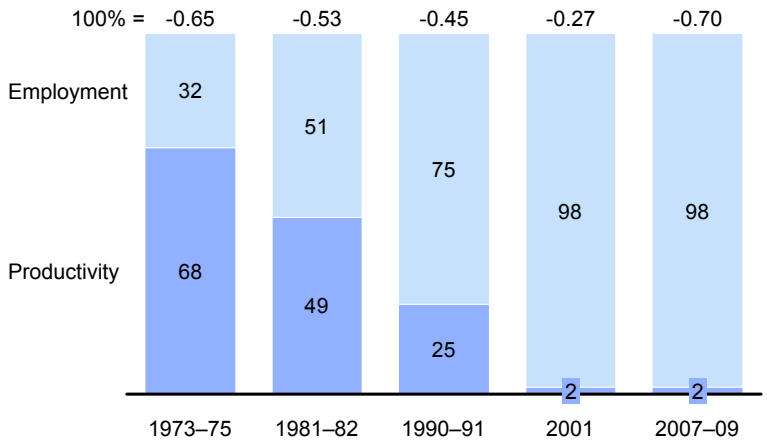
Our survey and interviews confirm this shift. Sixty-five percent of companies we surveyed—and 75 percent of large companies in this group—said they had made operational changes during the recession to reduce their need for more employees. Although some companies report that they have increased the hours of remaining employees, many others have used automation, process redesign, peak scheduling, and more part-time or temporary employees to meet demand without adding to permanent payroll (Exhibit 6).[12] In addition, one-third of companies with more than 1,000 employees said they have offshored more jobs in the past two years (see Box 2, "Globalization and US jobs").

Exhibit 5

In contrast to the past, firms today are more likely to lay off workers during a recession than suffer declines in productivity

Contribution to change in real GDP during recessions

Compounded quarterly growth rate,[1] peak to trough (%)

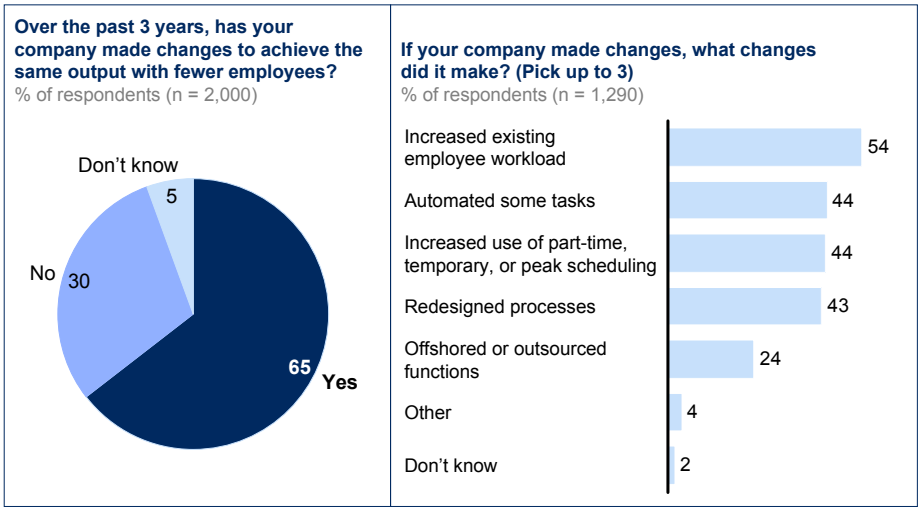


1 Calculated from the onset of recession to trough of GDP. Calculations use real GDP estimate (2005 chained dollars) and total employment (full time and part time) for workers ages 16 and over.

SOURCE: US Bureau of Labor Statistics; US Bureau of Economic Analysis; McKinsey Global Institute analysis

Exhibit 6

In our survey of US businesses, 65 percent reported they have restructured operations in the past three years to reduce headcount



SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

12 We surveyed 2,000 US companies as part of this project. See Appendix B for details.

These efficiency gains during recessions mean that companies can postpone hiring when the economy rebounds. When they do start hiring again, many employers said that they prefer to "start over" with new employees rather than call back ones who were laid off. And, as the CFO of a Midwest manufacturing plant acknowledged, "The downturn gave us cover to address performance-based cases." This means that many of today's laid-off workers must find new jobs in different companies or even different sectors—a process that usually extends the time it takes to find a new job.[13]

Matching workers to jobs has become more difficult

Jobless recoveries are also growing longer because filling jobs has become more complicated—both for workers and for employers. This is a function of restructuring during recessions, changing job requirements in an economy that is continuing to shift to higher-skill work, lack of information about available jobs, and declining mobility.

Box 2. Globalization and US jobs

American companies expand abroad for two reasons, each with its own implications for US jobs. First, they expand operations internationally to serve fast-growing markets abroad. In this decade, the majority of global economic growth will come from emerging markets. US companies invest in these countries to tap this growing demand, setting up production facilities, sales and marketing arms, and supply chains to be near their customers. This type of expansion abroad is unlikely to slow.

Second, US companies expand abroad or use overseas contractors to take advantage of large, low-cost, and increasingly accessible talent pools in China, India, and other emerging markets. Many companies have moved manufacturing, back-office support, and other services abroad to serve demand in the US market.

Today, however, the economics of offshoring are shifting. Wages are rising in coastal China and parts of India, and companies have learned of the many hidden costs and risks in managing vendors or operations half a world away. Executives also cite high employee turnover in some markets (about 20 percent annually), inconsistent quality, and concerns over loss of intellectual property. Manufacturers face additional issues, including rising transportation costs, and the complexity and risk of managing long supply chains. Japan's devastating earthquake is a tragic and vivid reminder of what can happen.

The result is a nascent "onshoring" movement that may gain steam. For example, both Delta and United Airlines have repatriated call centers from India to the United States because of customer complaints about quality. Also, as we will discuss in Chapter 4, US companies are tapping the pool of American workers who can perform call center, administrative, and other back-office work from their homes or from centers in lower-cost areas of the United States. Indeed, even foreign outsourcing vendors, including large ones such as Wipro and Tata Consultancy Services, have recently been hiring workers in the United States.

13 Moreover, not all workers will find new jobs, and some will accept lower wages upon reemployment. See Lori G. Kletzer, *Job loss from imports: Measuring the costs*, Peterson Institute for International Economics, 2001.

Many unemployed people must look for work in sectors where they do not have appropriate training or experience, inevitably making the process of reemployment far more difficult. At the same time, employers say they cannot find qualified candidates for some positions. In our survey of business executives, nearly two-thirds of respondents report that they routinely have difficulty filling some positions. The top reason they cite is that applicants lack specific qualifications or required experience.[14]

This skill and experience mismatch may pose problems for job creation ahead. Although half of the companies in our sample report they will expand employment over the next 12 months, 40 percent of these companies also say they have had positions open for six months or more because they cannot find the ideal candidates.

Another factor complicating job searches is that workers and students may lack information about the skills and qualifications they need for available jobs. There is no national system for conveying the needs of employers for applicants with specific credentials—e.g., welders or medical technicians—to employment services or directly to young workers entering the labor market from community colleges and technical schools.[15] Even when experienced workers find openings that seem to fit, they sometimes have trouble convincing employers that they have the right training because there also are no nationally recognized training or skill standards for most jobs.[16]

Finally, Americans are no longer as likely to move for a new job as they once were. In the 1950s and 1960s, one in five Americans changed residences every year, but that rate has fallen by half to one in ten today (Exhibit 7). There are many reasons for lower mobility, but an important factor is the rise in home ownership; renters are three times as likely to move within a year as home owners, and the collapse of the real estate market undoubtedly makes it harder for many home owners to consider relocation. In addition, the US population is aging and mobility is lower among older Americans. Mobility is also limited by the rise of dual-income families, which require two jobs for every move.

Decline in new business creation

The jobless recovery that is now unfolding also reflects the impact of slow job creation by new businesses, which have been important sources of employment over the past decades. Many new businesses may not survive, but in aggregate they contribute to both gross and net new job creation.[17]

During this recovery, new business creation has declined sharply. In the past decade, more than 600,000 businesses were started every year in the United States (Exhibit 8). But in 2010, only 505,000 were established—a 23 percent decline from 2007.

---

14 See Appendix B.

15 See Bridget Long, *Grading higher education: Giving consumers the information they need*, Harvard Graduate School of Education, December 2010; see also Erin Sparks and Mary Jo Waits, *Degrees for what jobs? Raising expectations for universities and colleges in a global economy*, National Governors Association Center for Best Practices, March 2011.

16 See ACT, Incorporated, *Breaking new ground: Building a national workforce skills credentialing system*, 2011.

17 See John C. Haltiwanger, Ron S. Jarmin, and Javier Miranda, *Who creates jobs? Small vs. large vs. young*, National Bureau of Economic Research working paper, 16300, August 2010.

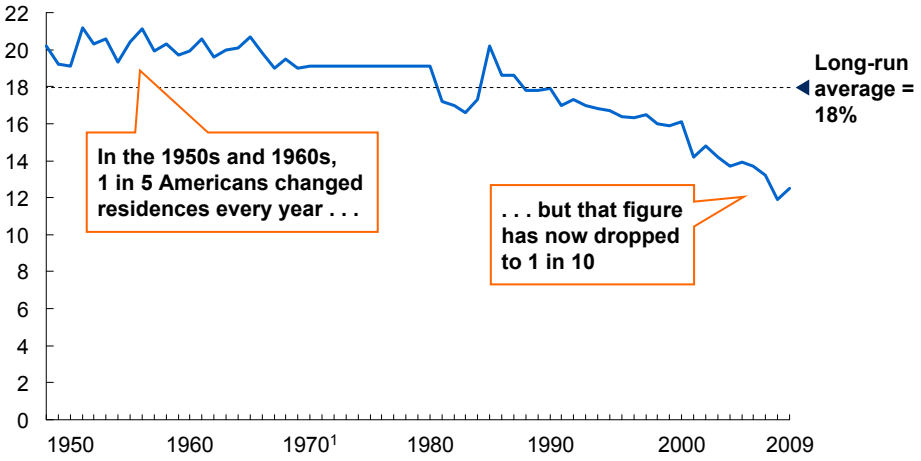
In addition, the size of new businesses has been declining: in 2000, the average had 7.7 employees; by 2010, that number had declined to 5.5.[18] This partly reflects the changing sector mix of new businesses, with fewer firms in construction and manufacturing and more in professional services. It also reflects growth in outsourcing administrative functions such as accounting and finance.

If the rate of new business creation had continued at 2007 levels and each start-up had hired six or seven employees, the United States might have employed 1.8 million more people in 2010, reducing unemployment by more than one percentage point.

Exhibit 7

Mobility in the United States has been declining since 1990 and is at a 50-year low

Annual domestic migration rate, 1948–2009
% of residents who have changed addresses during the past year

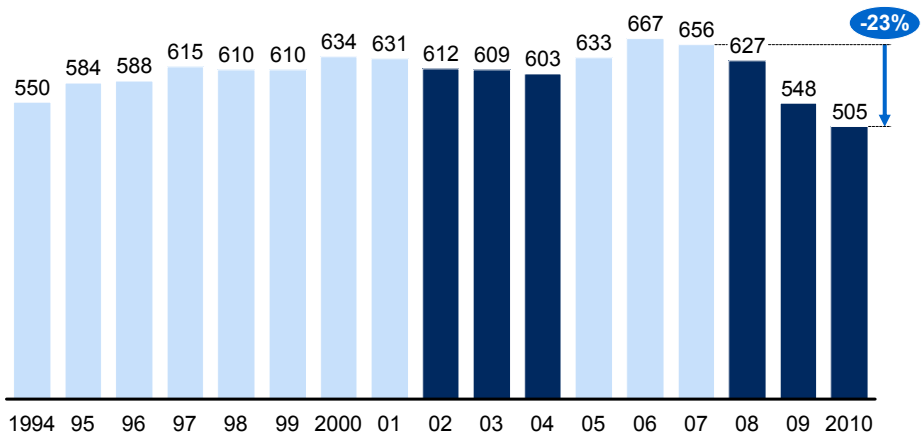


1 Data from 1970–81 are interpolated due to data constraints.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit 8

The number of new businesses has declined dramatically in this recession

Change in number of private-sector establishments launched every year
March 1993–March 2010,[1] thousand



1 Calculated using US Bureau of Labor Statistics Business Employment Dynamics data set. The annual number indicates the number of businesses less than 1 year old that were in existence in March of that year.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

18 Bureau of Labor Statistics' Business Employment Dynamics data set; "new firms" in this analysis represents all establishments that are less than one year old.

THE LONG-TERM EFFECTS OF PROLONGED UNEMPLOYMENT

The inevitable legacy of jobless recoveries is a growing cohort of workers who have experienced long-term unemployment and whose careers and lives may be forever altered. The longer people are idle, the more difficult it is for them to find a job; they fall behind in their specialties, and overall skills and work habits erode (or employers may perceive that they have eroded). Anecdotally, we know that some employers distrust gaps in work histories and may not consider applicants who have been unemployed for a long period of time.

In this recession, the duration of unemployment for people across all skill categories has been increasing. In 2008, the average term of unemployment for all idled workers was 18 weeks; in 2010, it was 33 weeks. As of December 2010, 6.4 million people had been out of work for six months or longer; 4.3 million had been out for more than a year.

Even when the long-term unemployed find jobs, they may experience a lower lifetime earnings trajectory and may be at greater risk for future periods of unemployment.[19] The average mature worker (aged 25–54) who is laid off during a major recession can expect to have 20 percent lower earnings over the next 15 to 20 years than those who held their jobs, according to academic research.[20] Also, college students graduating in a recession have lower starting salaries and may never catch up. Two-thirds of a graduate's gains in lifetime income (adjusted for inflation) occur in the first ten years of a career[21]—another opportunity that is diminished by a jobless recovery.

There are also societal costs. An extended period of unemployment lowers health outcomes and, according to one study, can reduce life expectancy by 1 to 1.5 years.[22] In addition, people who never regain employment or get a chance to enter the labor force add to the ranks of the permanently unemployed—people who are not on the tax rolls but depend heavily on public services. Therefore, policies that avoid jobless recoveries and put unemployed people back to work quickly have potentially high economic and social value.

EVEN BEFORE THE RECESSION, THE JOB-CREATING MACHINE WAS SPUTTERING

The task of reemploying the US workforce is made even more difficult by the pattern of job creation leading up to the recession. From 2000 through 2007, employment grew by just 7 percent (Exhibit 9). In contrast, employment grew 15–25 percent in every ten-year period from 1960 to 2000, despite at least one recession in each of those decades. Moreover, we estimate that 1.2 million of the jobs that were created in the middle of the decade were related to the real estate bubble—jobs in construction,

---

19 See Lisa Kahn, *The long-term labor market consequences of graduating from college in a bad economy*, Yale School of Management, September 2006.

20 See Till von Wachter, testimony before the US Senate Budget Committee, "Challenges for the US economic recovery," February 2, 1011; see also Louis S. Jacobson, Robert J. LaLonde, and Daniel G. Sullivan, *The costs of worker dislocation* (Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, 1993).

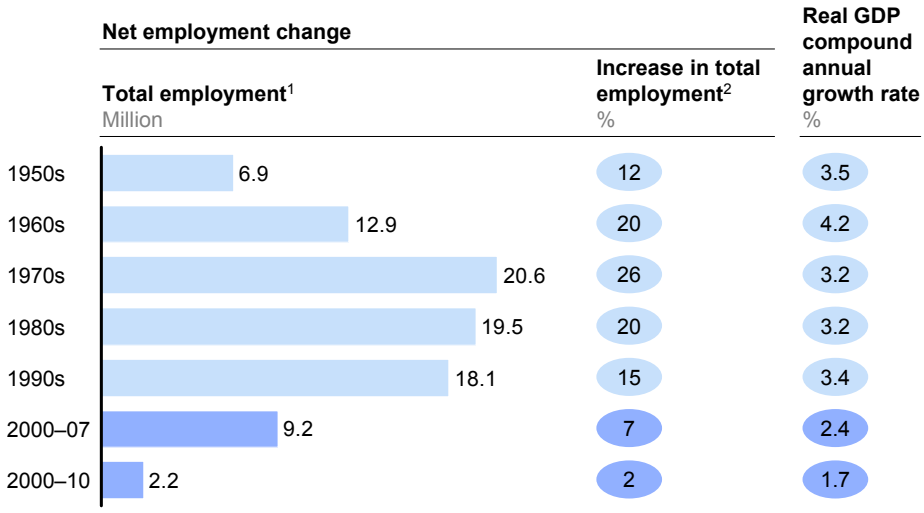
21 See Henry Farber, as quoted in Don Peck, "Early career moves are the most important," *National Journal*, May 8, 2010.

22 See Daniel Sullivan and Till von Wachter, "Job displacement and mortality: An analysis using administrative data," *The Quarterly Journal of Economics*, Volume 124, Number 3, 2009; see also Sarah A. Burgard, Jennie E. Brand, and James S. House, "Perceived job insecurity and worker health in the United States," *Social Science and Medicine*, Volume 69, Number 5, 2009.

finance, real estate, and other fields that would not have been created without the boom. They cannot be expected to return in a routine expansion and certainly will not as long as housing markets remain depressed.

Exhibit 9

Job growth in the 2000s was half the rate of previous decades



1 Total employment equals the number of all employed workers in the economy, including full-time, part-time, and self-employed.
2 Net employment change as a share of total employment in the base year (e.g., 1990 for 1990s).
SOURCE: US Bureau of Economic Analysis; US Bureau of Labor Statistics; McKinsey Global Institute analysis

So if the job creation process was faltering, why did the United States not see high unemployment rates? The main reason is that the labor force participation rate was falling, meaning that fewer people were in the labor force.[23] The portion of the US population in the labor force (either employed or looking for work) fell 1.1 percentage points from 2000 to 2007, from 67.1 percent to 66.0 percent. This reflects an aging population and more younger people staying in school—but it also reflects the slow decline in participation by prime working-age men. The drop is equivalent to about 2.5 million workers, and had all those people been looking for work, the unemployment rate would have been significantly higher.

□ □ □

The US job creation machine is not functioning as it has in the past—it no longer restarts quickly when economic activity rebounds. With each successive jobless recovery, the structural factors that hinder job creation become more apparent. Addressing these underlying issues will be critical not only to the lives of American workers, but also to the continuing success of the US economy.

23 The labor force participation rate measures the portion of the population aged 16 and over that is either employed or looking for work.

2. Wanted: 21 million jobs

In January 2010, the US economy started creating jobs again, albeit in halting steps. The net gain was 1.3 million jobs through March of 2011—barely enough to keep up with growth in the labor force. Hiring was broad-based across manufacturing, business services, and other major sectors. Government, construction, financial services, and real estate shed jobs.

The question now is whether job growth will continue and accelerate, restoring the US workforce to full employment within the decade, or if the jobless recovery will stretch for years. To have full employment—a 5 percent unemployment rate—in 2020, the economy would have to add 21 million jobs. This figure is based on reemploying today's unemployed and discouraged workers and finding jobs for the approximately 15 million net additions to the labor force over the decade.

To see how this can be accomplished, we created three scenarios for employment demand over the next ten years, based on macroeconomic forecasts of sector job growth combined with our own analysis of industry trends. The resulting scenarios, which illustrate sector employment trends and the factors driving them, range from creating as few as 9.3 million jobs to as many as 22.5 million.

The sobering message: only in our high-job-growth scenario does the United States reach full employment within the decade. In the low-job-growth scenario, with only 9.3 million new jobs, the United States would be mired in high unemployment through 2020 and beyond. Achieving the high-job-growth outcome will require robust performance in six key job-creating sectors, high demand for American products and services at home and abroad, and a return to historic rates of new business creation. In this chapter we explore the underpinnings of these job-growth scenarios and their implications for workers and the economy.

THREE SCENARIOS FOR JOB GROWTH

To build our three scenarios, we focused on six major sectors of the economy that by virtue of their size and growth potential will, to a large extent, determine overall US employment in the coming years: health care, business services, leisure and hospitality, construction, manufacturing, and retail. Together, these sectors account for 66 percent of private-sector employment today, and we estimate they will account for 70 to 85 percent of private-sector job growth in this decade.[24]

The six sectors also represent a cross-section of the economy and the labor market. Over the past decade, they have created jobs at varying rates. Health care has grown steadily, adding 3.7 million jobs from 2000 to 2010, despite two recessions.

24 We do not focus on the government sector, one of the largest employment sectors in the economy today, because the total number of jobs in federal, state, and local agencies has historically grown roughly as fast as population. Even assuming some fiscal consolidation, we find little reason to believe there will be a significant upside or downside in public-sector job growth. Our projection assumes that government employment grows more slowly than in the past, reflecting fiscal constraints, and it is very similar to projections by the Bureau of Labor Statistics and others.

Manufacturing and retail employment contracted over the decade. Employment in business services, one of the largest sectors, was essentially flat.

The six sectors comprise a range of high- and low-skill jobs. They also include sectors that are exposed to global competition because they have tradable goods and services (e.g., manufacturing and some business services) and sectors that produce domestic services that cannot be traded (e.g., health care and construction).

For all six of these sectors to achieve their upside scenarios, the economy has to perform well, too. That means progress on several fronts—increasing the speed with which businesses can expand, boosting exports, and encouraging the kind of innovation that creates fresh demand to propel the growth of GDP beyond the rate of productivity growth. And, as we will discuss in the next chapter, it will require improvements in education and training to close skill gaps.

If all these factors fall into place and the six sectors perform strongly, we calculate that the US economy will create as many as 22.5 million jobs in this decade (see Box 3, "Methodology for job creation scenarios"). If each follows its low-job-growth scenario, as few as 9.3 million new jobs will be created in the United States and unemployment will remain persistently high (Exhibit 10). In a midrange scenario, about 17.4 million jobs are created. This scenario represents a return to the long-term trend in net job growth prior to 2000–2007, or about 1 percent annually, and does not produce full employment by 2020.

Under all scenarios, we find that health care, business services, leisure and hospitality, and construction all produce some jobs; the question is how many (Exhibit 11). In manufacturing and retail, however, there are scenarios under which they shed jobs in this decade. We will examine each of these sectors.

Box 3. Methodology for job creation scenarios

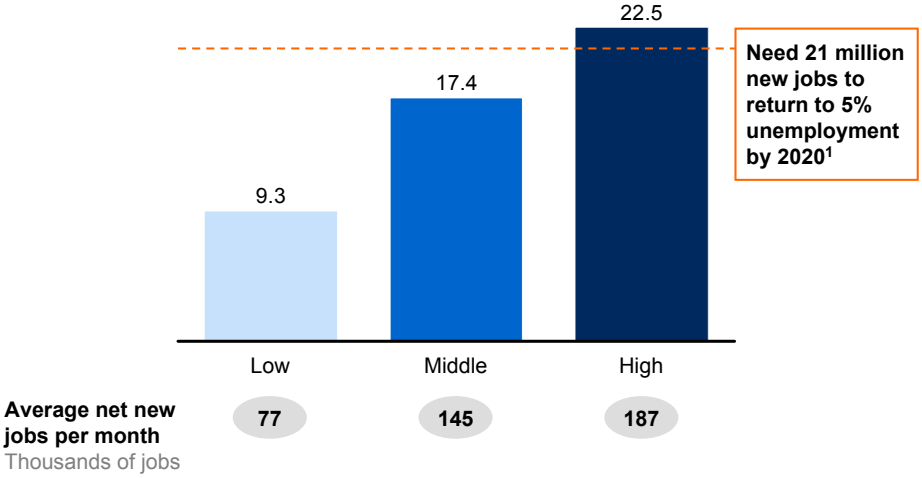
To create scenarios for job growth in the US economy through 2020, we use a bottom-up approach that examines each sector individually. We base our analysis on several sources of information: sector-level employment and GDP projections from external macroeconomic forecasters (Moody's Analytics, Bureau of Labor Statistics, and Global Insight); sector-specific trends, based on expert and client interviews and quantitative analysis; and historic rates of employment and productivity growth in each sector. For each sector, we developed a low-job-growth scenario, a high-job-growth scenario, and a midrange scenario. We then add together these sector estimates to obtain the overall employment scenarios.

While we do not factor inter-sector dependencies in these scenarios, we use an adding-up constraint to ensure that top-line employment growth combined with a range of productivity growth assumptions results in reasonable GDP growth projections. In key sectors, such as manufacturing, we also test implications for the US trade balance. These scenarios illustrate how job growth could evolve and highlight the critical factors that will determine the different outcomes. However, they are not meant to be a forecast of job growth. For more detail on the sector-specific assumptions in each scenario, see Appendix A.

Exhibit 10

The high-job-growth scenario is the only one that returns the United States to 5 percent unemployment by 2020

Employment demand scenarios
2020, millions of jobs

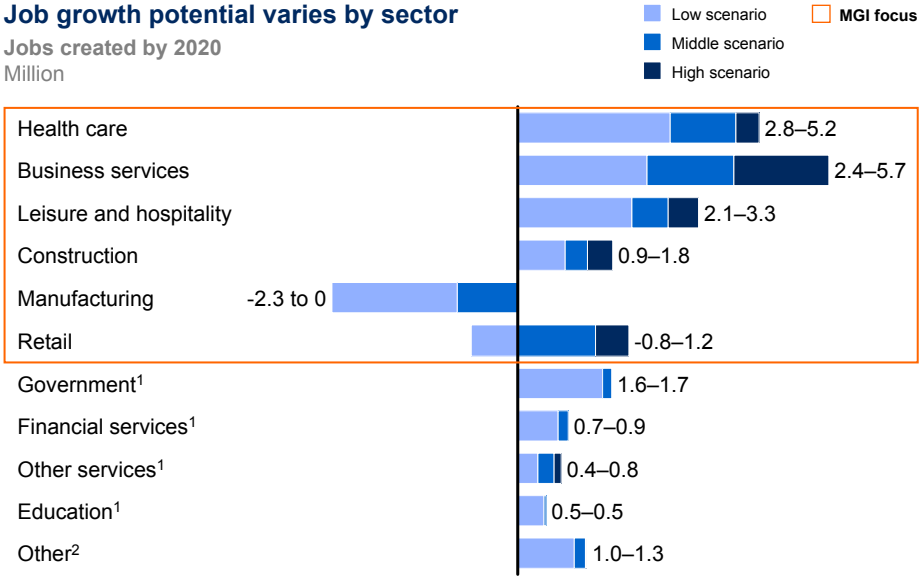


1 Based on our labor force supply projections discussed in Chapter 3 of this report.
SOURCE: Moody's Analytics; McKinsey Global Institute analysis

Exhibit 11

Job growth potential varies by sector

Jobs created by 2020
Million



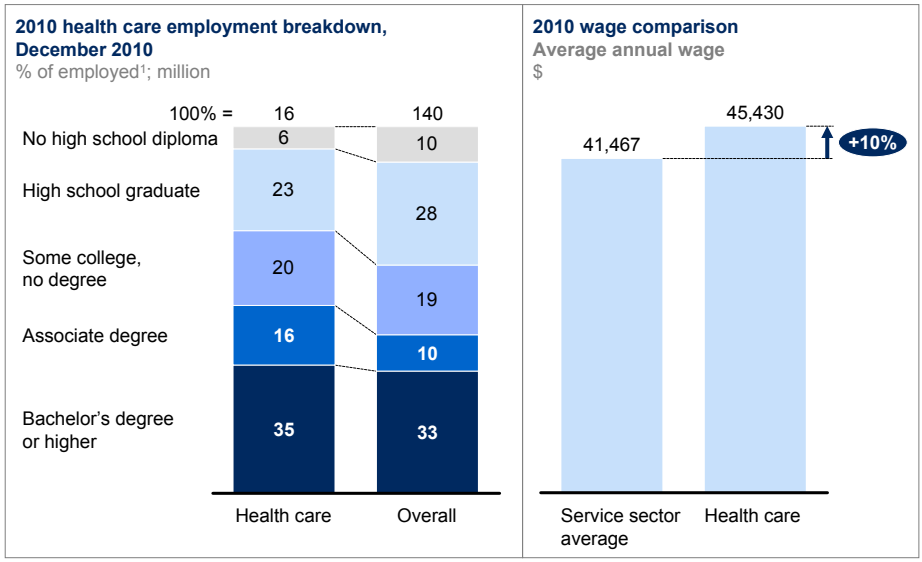
1 Job growth for the first six sectors listed comes from the MGI job growth scenarios. For all other sectors, job growth is taken from Moody's Analytics. See Appendix A for more detail.
2 Other includes mining, utilities, wholesale trade, transportation and warehousing, information, self-employed, and agriculture.
SOURCE: Moody's Analytics; Global Insight; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Health care

The health care sector has been the most reliable engine of job growth in the economy over the past decade, adding jobs even during the recession. Moreover, 71 percent of those employed in the sector have more than a high school education, compared with 62 percent economy-wide, and average wages are 10 percent higher than the national average for service-sector jobs (Exhibit 12). Although one-third of health care jobs are in hospitals, the largest job growth over the past decade has been in nursing and residential care, social assistance, and home health care services.

Exhibit 12

Health care jobs require more education and offer higher wages



1 Payroll employment (does not include self-employed). See Appendix A for calculation details.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

In this decade, we estimate that the sector could add 2.8 million to 5.2 million jobs. The driving force behind job creation will be the aging population and the expansion of insurance coverage under the 2010 Patient Protection and Affordable Care Act. Job growth could be limited by efforts to curb the rise in health care spending, adoption of alternate payment models that would likely reduce the number of procedures, and a strong push for productivity improvements in health care services.

In the high-job-growth scenario, rising demand for services from an aging population and from a growing incidence of chronic disease across the population far outpaces efforts to contain costs and improve productivity. Seniors consume more health care than any other age group, and the older they get, the more they need labor-intensive care such as home health aides. The total health care bill for Americans over age 65 is 5.6 times that of children up to age 18 and three times that of Americans between the ages of 18 and 65. The number of Americans over 65 will grow from 40 million in 2010 to 55 million in 2020. As a result, annual spending on Medicare alone is projected to increase from $515 billion to $1.05 trillion.[25]

The other force driving the 5.2 million jobs scenario is the expansion of insurance coverage under the Affordable Care Act. Starting in 2014, as many as 34 million[26] currently uninsured Americans will gain coverage, and, according to the Centers for Medicare and Medicaid Services, this will raise national health care spending[27] by as much as 0.2 percent annually, or by $80 billion to $110 billion a year.

The less predictable factors in health care are the effects of efforts to contain costs and improve productivity and the possibility of future breakthroughs in treatments

25 Based on *National health expenditures projections 2009–2019* by Centers for Medicare and Medicaid Services, Office of the Actuary.

26 Centers for Medicare and Medicaid Services, Office of the Actuary.

27 The estimated rise in national expenditures is a net figure, factoring in not only the expansion of coverage but also the cost-cutting measures included in the 2010 Patient Protection and Affordable Care Act.

and care approaches. Depending on the pace of innovation and the payment approaches used, these efforts could have a positive impact on health care job growth. If, for example, efficiency programs focus on shifting more work to lower-cost employees from high-cost ones, new jobs would likely be created.

However, a blunt-instrument approach (i.e., across-the-board cuts by payers) would limit job growth, especially if existing scope-of-practice rules and fee-for-service payment schemes remain in place. Replacing fee-for-service billing with an "episode of care" approach would simplify claims processing and reduce the need for administrative personnel as well. So, too, would some forms of automation and the application of rigorous business-process redesign, which has not been used widely in health care and could lead to offshoring some administrative and medical technician jobs. Our low-job-growth scenario assumes significant health care productivity growth, without job-creating innovation in delivery models. This would limit health care job growth to 2.8 million through 2020, the lowest level in three decades.

Business services

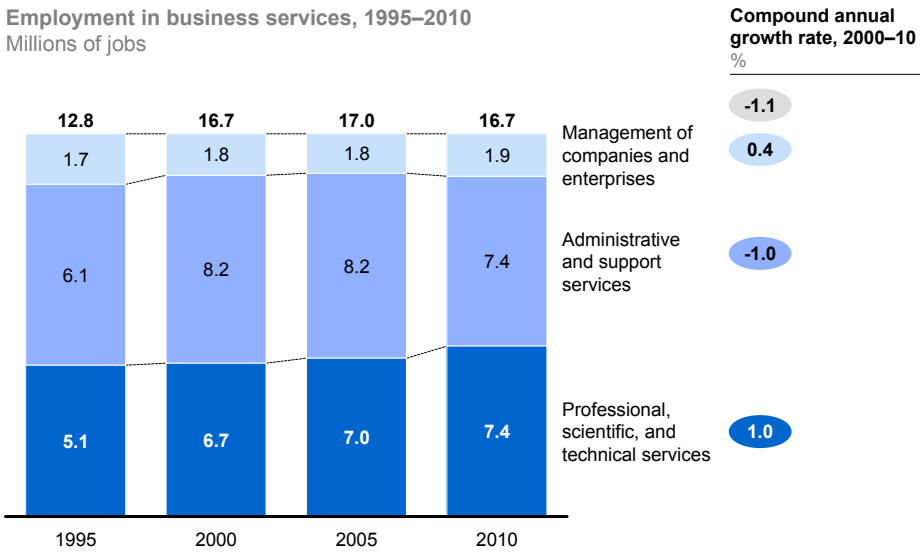
Nearly 17 million Americans are employed in business services, making it second only to the government sector in terms of total employment. But with more than 1.5 million payroll jobs lost during the recession, employment growth in the sector was essentially flat for the 2000–10 decade, after rapid growth in the 1990s.

Business services include occupations ranging from administrative assistants and janitors to architects and research scientists. The vast majority of jobs fall into two broad subsectors of roughly 7.5 million each: administrative services, and professional, scientific, and technical services (a third subsector includes management of companies and enterprises). Demand for administrative support personnel has declined, often because tasks could be automated or performed in a lower-cost nation. Meanwhile, demand for high-skill service-sector professionals such as engineers has been rising (Exhibit 13).

Exhibit 13

In business services, administrative and support jobs have fallen in recent years

Employment in business services, 1995–2010
Millions of jobs



NOTE: Numbers may not sum due to rounding.
SOURCE: Moody's Analytics; McKinsey Global Institute analysis

In this decade, we project that job growth in the business services sector could range from 2.4 million to 5.7 million. In the upside scenario, offshoring slows or begins to reverse for some types of work. As in manufacturing, this is because the economics of offshoring are changing. In our interviews, companies say they are considering moving service jobs back to the United States, citing concerns over quality, reliability, high turnover, and rising wages abroad (see Box 2, "Globalization and US jobs," in Chapter 1). For customer-facing positions, such as call center employees or administrative assistants, companies are finding that US service representatives based in remote centers or working from home can be cost-competitive with those in low-wage countries when their superior productivity is factored in.

The low-growth scenario in business services would involve not only the continued offshoring of administrative and back-office functions but also increasing use of offshore outsourcing for higher-skill jobs. India, China, Poland, Costa Rica, and other low-cost nations are developing skilled labor forces that are capable of IT support functions such as programming and product design, among other tasks. This type of offshoring could also get a push from the emerging skill gap, in which there will likely be too few college graduates for technical positions in the United States, which we describe in Chapter 3. This would limit business services job growth to 2.4 million through 2020.

Leisure and hospitality

The leisure and hospitality sector, with more than 13 million workers in 2010, is the fifth-largest employer in the United States. In this sector, fewer than a quarter of employees have an associate degree or higher, and most jobs require only on-the-job training. Accommodation and food service is the largest subsegment, with 11.1 million workers. Arts, entertainment, and recreation employ 1.9 million. Overall, employment in leisure and hospitality was relatively resilient during the recession, shedding about 400,000 jobs, or 3 percent of its workforce, from 2007 to 2010.

In this decade, we estimate that this sector could add 2.1 million to 3.3 million jobs. Most will be in food service, which is highly correlated to consumer spending. While American consumers will provide the bulk of spending, to reach the high-job-growth scenario, the United States needs to retake lost ground in global tourism. While international long-haul travel increased by 31 percent from 2000 to 2009, the number of visitors to the United States dropped. Foreign visits fell from 26 million in 2000 to 18 million in 2003, before recovering to 24 million in 2009. Had the United States maintained its market share in global tourism, the country would have had 67 million more visits and $214 billion in additional revenue in the past decade. By some estimates, this would have produced roughly 200,000 jobs in the leisure and hospitality sector and 200,000 more across the rest of the economy (Exhibit 14).[28]

In particular, the United States is not getting its share of tourism from a rising global middle class. More Chinese tourists visit France than the United States, for example. A weak dollar should help bring in tourists from China, Brazil, India, and other fast-growing economies—and will keep more Americans spending on leisure and hospitality at home. However, better promotion of the United States as a tourist destination and faster visa processing will also be critical.

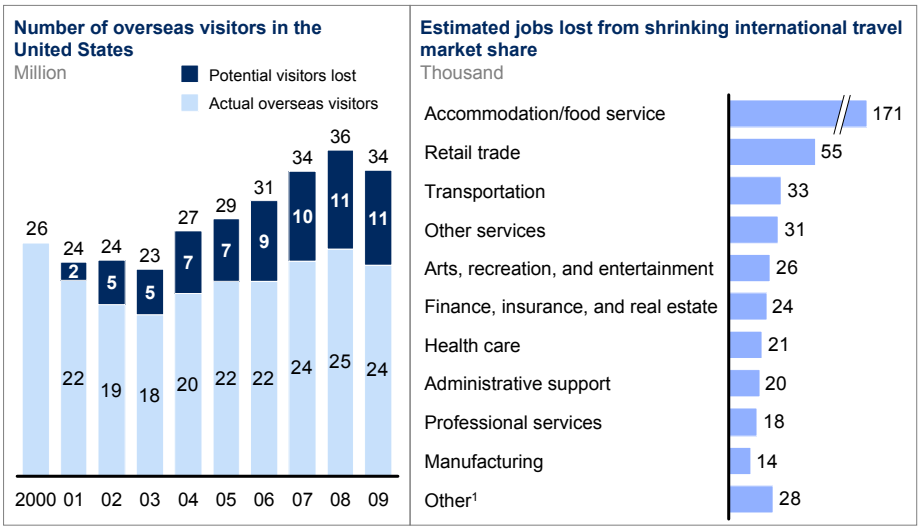
Because of the labor-intensive nature of leisure and hospitality work, sector productivity gains have been modest and relatively constant over the past 20 years. Hospitality industry leaders believe they could streamline operations in cities such

28 See US Travel Association and Oxford Economics, *The lost decade: The high costs of America's failure to compete for international travel*, February 2010.

as New York and San Francisco but say they are constrained by unions and local regulations. Overall, we do not assume significant productivity gains across the sector, which means that employment will remain tied to sector demand growth. In the slow-growth scenario, which would be the result of slow economic recovery in the United States and no significant gains in foreign tourism, sector job growth would be limited to 2.1 million.

Exhibit 14

The US experienced a large decline in international tourists since 2000 that may have cost the country an estimated 400,000 jobs



1 Other includes agriculture, construction, information, management, and education.
NOTE: Numbers may not sum due to rounding.
SOURCE: US Travel Association; Oxford Economics; McKinsey Global Institute analysis

Construction

The construction sector was hit hard during the recession, losing 2.1 million jobs from 2008 through 2010. Nearly 90 percent of the losses were the direct result of the real estate market collapse, including layoffs of 1.4 million trade contractors (electricians, plumbers, heating and air-conditioning specialists) and 500,000 residential/commercial construction workers (Exhibit 15). While in past recoveries the construction sector has been an early job creator, in 2010 the industry continued to contract because of the glut of unsold homes. Annual housing starts remain at 600,000, or just 40 percent of the long-term average of 1.5 million.

In this decade, we estimate that 900,000 to 1.8 million jobs will be created in construction. The primary determinant of employment will be the strength of the housing recovery. In the high-job-growth scenario, residential real estate markets stabilize and housing starts return to their long-term average by 2014. It also assumes some incentives for retrofitting buildings for energy efficiency, which would boost the number of specialty contractor jobs.[29] An increase in infrastructure spending could also produce jobs, albeit on a more modest scale. That seems unlikely, given fiscal constraints, unless new financing mechanisms can be scaled up.

The low-job-growth scenario assumes that housing starts remain below 1 million through 2015 and that no major retrofitting or infrastructure programs are enacted that go beyond existing public-sector programs. In this scenario, construction employment remains below its 2007 peak for the entire decade.

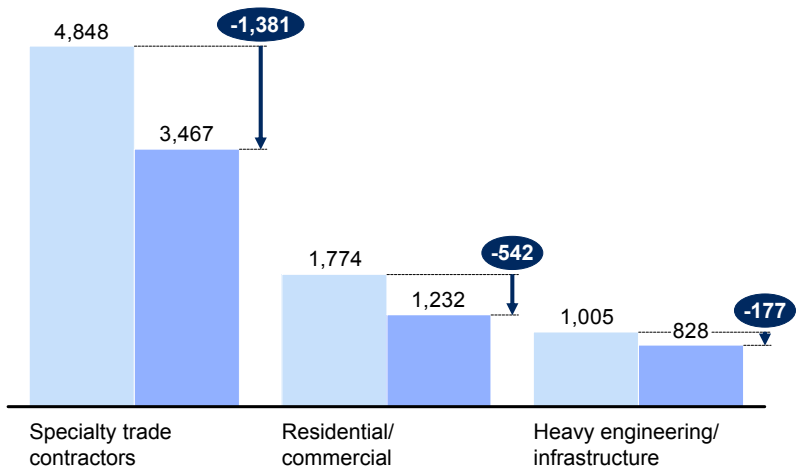
29 For examples, see *Green jobs study*, U.S. Green Building Council, November 12, 2009.

Exhibit 15

Within construction, the building and specialty trade contractor subsector had the largest job losses

Declines in construction employment, 2007–10

Thousands of jobs



SOURCE: Moody's Analytics; McKinsey Global Institute analysis

Manufacturing

Discussions of employment in the United States are often dominated by manufacturing. Manufacturing captivates economists and other observers because of its historical contribution to the American standard of living and its continuing importance as a source of innovation and skill building. As former Intel Chairman Andrew S. Grove has argued, the loss of manufacturing may lead to a lack of innovation because the nation breaks "the chain of experience that is so important in technological evolution . . . abandoning today's 'commodity' manufacturing can lock you out of tomorrow's emerging industry."[30]

But after 30 years of a declining share of the US economy, manufacturing now represents just 12 percent of GDP and 11 percent of total employment. Job losses accelerated dramatically over the past decade, with employment falling by 5.7 million (Exhibit 16). These losses reflect the effects of automation, process redesign, and offshoring, as manufacturers boosted efficiency in the face of global competition.[31] In the recovery so far, the manufacturing sector has been a standout, adding about 300,000 jobs since January 2010. That's about 1.8 percent annual growth, the strongest for manufacturing since the late 1980s.

Based on our interviews and research, we can envision a scenario in which manufacturing job losses are much smaller or even stop in the decade ahead. While this may not sound like a very optimistic outcome, it would imply that the United States gains share in manufacturing employment among advanced

30 Andy Grove, "How America can create jobs," *Bloomberg Businessweek*, July 1, 2010.

31 See Martin Neil Baily and Robert Z. Lawrence, "What happened to the great US job machine? The role of trade and electronic offshoring," *Brookings Papers on Economic Activity*, Number 2, 2004.

economies.[32] This upside scenario can happen if three forces play out: exports grow; some offshored manufacturing jobs are repatriated due to shifting economics; and there is strong demand in subsectors where US companies have a competitive advantage or where there are barriers to offshoring (e.g., high transportation costs).

The possibility of returning some manufacturing jobs from overseas was raised by many executives, who said that the economics of producing goods abroad versus in the United States is shifting. Wages in some countries, such as China, are rising rapidly. Also, companies are now willing to reconsider US locations to gain greater reliability and to reduce risks associated with the loss of intellectual property and managing long global supply chains. One interviewee told us, "It has proven hard to manage a global supply chain and a widely dispersed workforce. Quality has also been a problem."

Consequently, some manufacturers are "onshoring." General Electric is moving production of water heaters from China to Kentucky this year, and US Block Windows, a maker of acrylic glass blocks, brought production back from China to its headquarters in Pensacola, Florida, in 2009.[33]

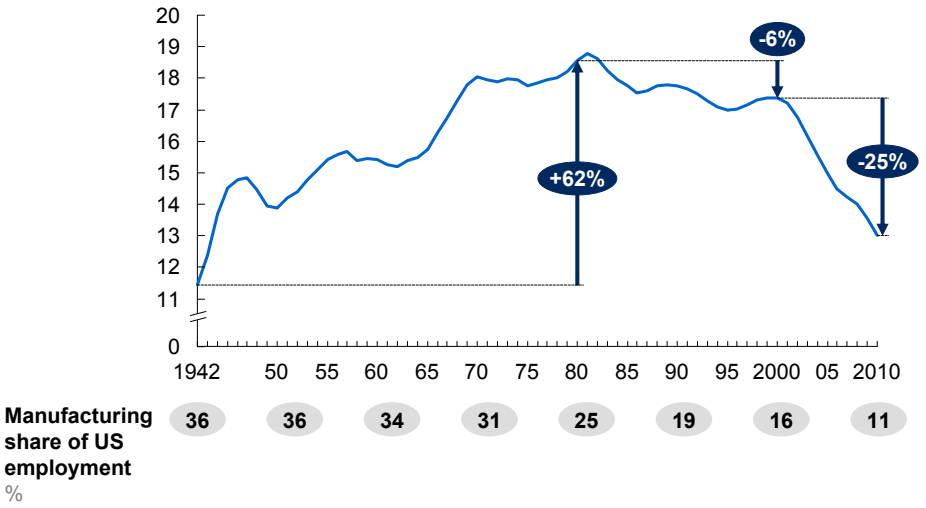
The low-job-growth scenario would unfold if demand growth does not exceed productivity gains—continuing the pattern of the recent past. From 1997 to 2007, manufacturing productivity grew by 6.8 percent annually, while sector output grew only 3.9 percent annually, resulting in large-scale job losses. If productivity continues to advance—and there is little reason to believe otherwise—while export demand lags, the sector could lose as many as 2.3 million more jobs by 2020. If this happens, it may be difficult for the United States to return to full employment.

Exhibit 16

US manufacturing employment has been shrinking since 1980, but the pace dramatically accelerated after 2000

Manufacturing employment, 1942–2010, 5-year moving average

Millions of jobs



SOURCE: US Bureau of Labor Statistics; National Bureau of Economic Research; McKinsey Global Institute analysis

32 Between 1990 and 2007, manufacturing employment declined by 15 million in a group of 20 advanced economies that includes the EU-15, the United States, Japan, Canada, New Zealand, and South Korea.

33 Kris Maher and Bob Tita, "Caterpillar joins 'onshoring' trend," *The Wall Street Journal*, March 12, 2010.

Retail

The retail sector currently accounts for more than 14 million jobs, about 12 percent of private-sector employment. During the recession, the sector shed close to 1.1 million jobs, with the deepest losses in subsectors that had benefited from the credit boom: home furnishings, building materials and supplies, automobiles, electronics, and appliances. But even before the recession, employment growth was weak: retail added only 200,000 jobs between 2000 and 2007. Several large subsectors such as grocery stores, department stores, and gas stations reduced employment.

This decade could bring sharply different outcomes in retail job growth—as many as 800,000 jobs lost or 1.2 million jobs added. The high-job-growth scenario would expand the workforce by 0.8 percent annually, based on a sustained rebound in consumer spending, which in turn depends on falling unemployment and rising incomes. That is an achievable goal: in the 1990s, when economic growth was rapid and consumer preferences shifted to up-market merchandise, the sector racked up 1.5 percent annual job growth, despite strong productivity gains through automation and process improvements.

The downside scenario would be based on a weak recovery. Consumers would continue to favor discounters—as they have done in the past decade—and the sector's steady drive for productivity would reduce the need for jobs. McKinsey's 2009 Consumer Sentiment Survey suggests that the recession fundamentally altered consumer behavior. More than half of respondents said they will maintain the frugal habits they adopted during the downturn, and 40 percent say they will "never return" to spending the way they did before the recession. In the low-job-growth scenario, retailers would seek labor-saving opportunities, such as introducing more self-checkout systems, using automated restocking systems (perhaps enabled by RFID tagging), and relying more on online sales.

THE PATH TO HIGH AND LOW JOB CREATION SCENARIOS

The sector-specific drivers of job growth already outlined are part of a broader economy-wide dynamic of job creation. At its simplest level, jobs are created when demand grows faster than productivity improves, due to either increased consumption of the same goods and services or because innovations create new products, services, and types of experience (e.g., IMAX movies). When this occurs, companies must expand employment to fill demand. Conversely, when demand is flat or growing slower than productivity, companies can produce the additional output needed with the same or fewer inputs.

This mathematical relationship between labor productivity growth, job growth, and demand growth (or GDP growth) is seen clearly in the historical data. Exhibit 17 shows that the largest employment gains since 1980 have been in sectors such as health care, where demand has risen rapidly but productivity gains have been limited.[34] In manufacturing, the opposite has been true.

Over the long term, productivity and employment grow in tandem. By steadily improving productivity (output per worker), the United States and other advanced economies are able to pay high wages that support rising standards of living (see

34 Nobel laureate Michael Spence discusses the implications for the US economy of these structural trends. See Michael Spence and Sandile Hlatshwayo, *The evolving structure of the American economy and the employment challenge*, Council on Foreign Relations working paper, March 2011.

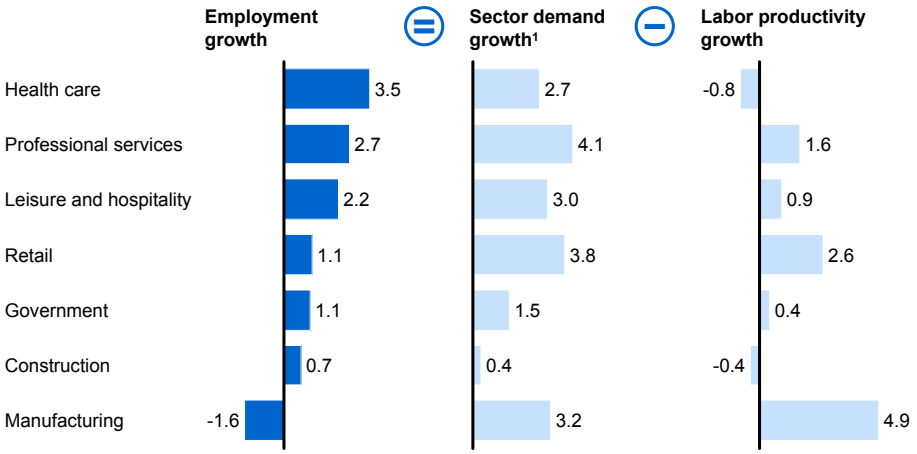
Box 4, "The long-term relationship between productivity and jobs"). Part of the jobs challenge the United States now confronts stems from the pattern of productivity growth since 2000. Unlike the 1990s, when many of the industries with the fastest productivity growth also expanded employment, almost all productivity gains in the past decade came from efficiency improvements. [35] This severely limited the need for hiring.

Exhibit 17

Employment growth is highest in sectors with higher demand growth than labor productivity growth

Compound annual growth rate, 1980–2010

%



1 Sector demand growth indicates real GDP growth in sector.
NOTE: Numbers may not sum across rows because the methodology uses an approximation to measure the change. See Appendix A for more detail.
SOURCE: Moody's Analytics; McKinsey Global Institute analysis

High job growth depends on rising demand, an export revival, and addressing the skill mismatch

Creating the 22.5 million new jobs of our high-job-growth scenario implies 1.3 percent annual growth in jobs, which is by no means impossible or unprecedented. The United States had periods of very high job growth (as much as 1.9 percent annually) and high GDP growth (more than 3 percent annually) in the last five years of both the 1980s and the 1990s.

Robust demand growth will be a prerequisite. Consumer demand remains critical in the United States and will be needed for retail, leisure and hospitality, and construction to reach their high-job-growth targets. Demand can also come from foreign consumers, spurring export growth.

Health care will be pivotal. As noted, if efforts to rein in health care costs are done in ways that do not limit overall sector employment (for instance, shifting some activities of physicians to physician assistants, nurse practitioners, or community health care workers), the increased demand from the aging population and expansion of insurance coverage could add more than 5 million new US health care jobs by 2020.

35 See McKinsey Global Institute, *Growth and renewal in the United States: Retooling America's economic engine*, February 2011 (www.mckinsey.com/mgi).

Avoiding further job losses in manufacturing will also be critical in the high-job-growth scenario and would most likely require improvement in net exports. Repatriating some of the service and manufacturing jobs that have moved overseas—as we are starting to see—will be essential and may well be achievable.

Achieving the high-job-growth scenario will require progress on several fronts—increasing the speed with which businesses can expand, boosting exports, and encouraging the kind of breakthrough innovation that creates fresh demand, which in turn propels the growth of GDP beyond the rate of productivity. And, as we will discuss in the next chapter, it will require improvements to education and training to close skill gaps.

Getting to the high-job-growth scenario is vital for the nation's future well-being. While highly educated Americans will enjoy job growth in all scenarios, only under the high-job-growth scenario does employment grow significantly for workers with less than a college degree. This scenario offers the possibility that the United States can start to reverse two decades of "hollowing out" of middle-income jobs, which are essential to social mobility.[36]

Weak demand and a lack of improvement in exports lead to the low-job-growth scenario

The low-job-growth scenario is frighteningly familiar: it is essentially the job creation trend since 2000. It would mean further rapid contraction in manufacturing employment, a continued wave of automation and offshoring in business support functions, and a productivity revolution in retail based on automation. Where the scenario would diverge from the past decade is in health care, where heightened pressure to control costs could slow down job growth despite rising demand.

The largest macroeconomic force pushing the United States toward the low-job-growth scenario would be sluggish consumer demand. And there are many reasons that consumers might hold back in coming years: rising commodity prices, a higher savings rate by households trying to rebuild wealth or prepare for retirement, a continuing slump in housing, or simply breaking old spending habits. The impact of slow growth in consumer demand will be felt in leisure and hospitality as well as in retail and construction.

As we noted in Chapter 1, when demand is weak, companies turn to efficiency measures to preserve productivity and employment suffers. When asked what would prompt them to hire, companies consistently cite sustained demand growth as the most important trigger. Indeed, in our research we heard from many executives who said they are not yet convinced that the economy will grow consistently in the next few years, which helps explain the modest job growth of the past year.

Finally, the economy is not likely to achieve the top-line growth it needs for sustainable job creation without improving the nation's competitiveness and trade position. Without an effective effort to promote US exports, sectors such as manufacturing and tourism will not maximize hiring. And rising trade deficits could weaken US job creation as consumers and businesses purchase more imports.

36 See David Autor, *The polarization of job opportunities in the U.S. labor market*, Center for American Progress (The Hamilton Project), April 2010.

Box 4. The long-term relationship between productivity and jobs

When viewed over long periods, productivity growth and employment in the United States have risen together. Indeed, this has occurred in every ten-year period since 1929, except for one.

Productivity growth and job growth complement each other over time for several reasons. First, productivity growth often enables producers to reduce prices for their goods or services, which can lead to higher demand. For instance, the falling price of telecommunications services means that consumers spend more time talking on their phones than they did 20 years ago—and they now use cell phones for things not even considered as phone functions then, such as transferring e-mail, images, and video. As wireless becomes more ubiquitous, new products and services continue to be introduced, spurring further demand.

In other cases, falling prices of one good can enable consumers to spend more elsewhere. For instance, higher energy efficiency in California since 1990 has led to $56 billion in savings on household energy bills compared with other states, which according to one source created an estimated 1.5 million jobs in other sectors.[1] In addition, productivity growth can come from producing groundbreaking or higher-value goods rather than cutting costs. Many sectors of the US economy experienced this type of productivity growth in the 1990s, but fewer have since 2000. Reviving innovation-driven productivity growth will be an important challenge in this decade.

1 David Roland-Holst, *Energy efficiency, innovation and job creation in California*, Center for Energy, Resources and Economic Sustainability (CERES), University of California, Berkeley, October 2008.

□ □ □

For the US economy to return to full employment in this decade, many positive forces will have to come together. Demand will need to grow robustly, reflecting both a recovery in housing and more support from exports. Consumers will need to feel confident enough to spend, and business leaders will need to see an environment in which their investments in new products and services will pay off. That is when new jobs will appear. As we will see in the next chapter, the next challenge is making sure that potential workers are qualified for those new jobs.

3. America's evolving workforce: Investing in a national asset

There is a common myth about what's happening to America's workforce—that it is about to shrink dramatically as the baby boom generation retires. To be sure, the US workforce is growing older. By 2020, 37 percent of the working-age population will be 55 or older—up from 27 percent in 2000. But instead of a giant void in the labor force in 2020 where boomers used to be—and an economy with too few workers to drive GDP—the US labor force will grow steadily in this decade, reaching 168.9 million in 2020 from 153.8 million in 2010.

However, the configuration of this growing workforce will not neatly match the needs of a 21st-century economy: too few students will obtain college degrees, too many will have no more than a high school diploma, and the number of Americans without even a high school education will rise. Moreover, if current trends prevail, the US educational system is on course to award too many degrees in fields with low job demand and too few in high-growth fields. The result: the skill mismatches discussed in Chapter 1 will worsen.

These issues make it easy to overlook the fact that the US workforce remains a national asset. The large employers we interviewed agree that the depth and breadth of the US talent pool and the American work ethic remain important strengths. "US workers' standards are high, and they're very adaptable," one executive from a large global company noted. "We get fabulous productivity in the US, and retention is not a problem." In the midst of a jobless recovery, it is easy to lose perspective on why a growing labor pool is such a potent force: properly educated and matched to jobs, the American workforce will be the engine for continued economic growth and innovation.

THE UNITED STATES WILL ADD APPROXIMATELY 15 MILLION WORKERS TO THE LABOR FORCE BY 2020

We project that the US labor force will increase from 153.8 million in 2010 to 168.9 million by 2020.[37] This implies an annual growth rate of 0.9 percent—lower than in most previous decades but still significant (Exhibit 18).

The American labor force continues growing despite declines in the labor force participation rate. As noted in Chapter 1, the proportion of Americans over age 16 in the labor force fell from 67.1 percent in 2000 to 66.0 percent in 2008—and then to 64.7 percent in 2010, reflecting a rise in discouraged workers who have (temporarily or permanently) left the labor force.

Most of the drop in participation between 2000 and 2008 is explained by the rising average age of the population. Even the plateauing of female labor force

37 This projection fits within a range used by government and private forecasters. For example, adjusted Bureau of Labor Statistics 2018 estimates would result in 169.6 million people in the US labor force in 2020; the Congressional Budget Office comes in at 167.4 million; and Moody's Analytics at 166.4 million. Macroeconomic Advisers predicts in recent reports that the labor force will be as high as 172 million to 173 million.

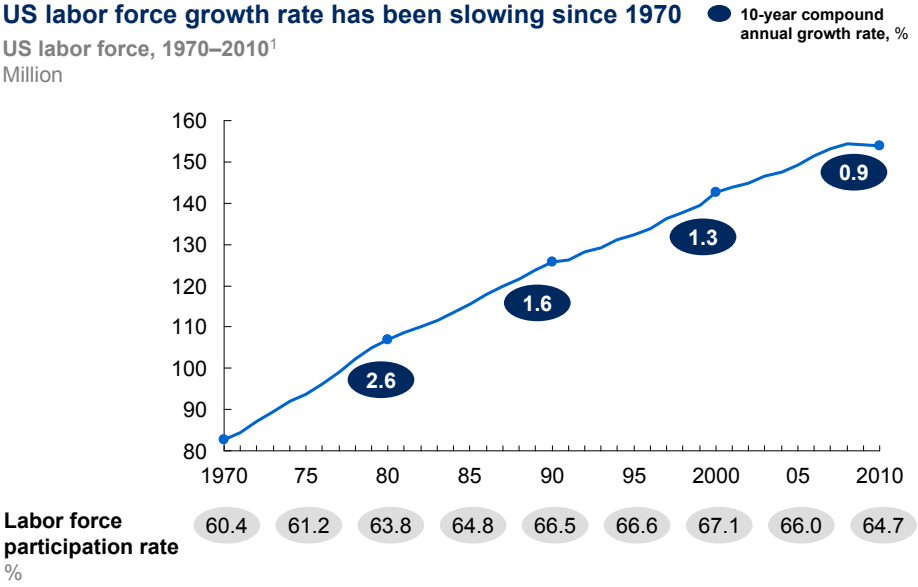
participation—often cited as a factor in slow labor force growth—is driven mostly by aging and only marginally by a change in the willingness of women of any age to work. For women between the ages of 55 and 64, the labor force participation rate actually increased by 8 percentage points in the decade leading up to the 2008 recession.

Nevertheless, relative to other major developed nations, the United States still has strong workforce growth. Across Western Europe, birth rates have been lower than in the United States, and immigration has been much slower. As a result, France and Germany, for example, had annual labor force growth of just 0.6 percent from 2000 to 2010. Across the EU-27, the workforce is expected to grow by only 0.3 percent annually in this decade (and without a projected 1 million immigrants per year, it would be slightly negative).[38]

Exhibit 18

US labor force growth rate has been slowing since 1970

US labor force, 1970–2010[1]
Million



1 Working-age population consists of persons 16 years of age and older who are not inmates of institutions and who are not on active duty in the armed forces.

SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Sources of US labor force growth

In this decade, we calculate that there will be 15 million net additions to the labor force[39] as approximately 40 million new workers will enter and 25 million workers exit. The biggest inflow will be 29 million young people leaving the educational system and joining the workforce, according to projections by the National Center for Education Statistics (Exhibit 19). The next largest source will be immigration, which we estimate will add 9 million workers to the labor force over the decade, based on a midrange estimate from the US Census Bureau.[40]

38 See Directorate-General for Economic and Financial Affairs of the European Commission, "2009 ageing report: Economic and budgetary projections for the EU-27 member states (2008–2060)," *European Economy*, Volume 2, 2009.

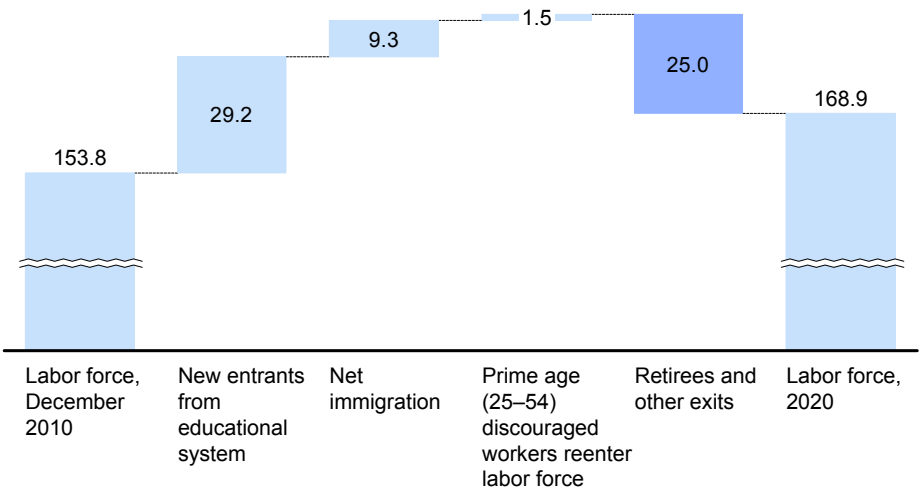
39 The labor force consists of people over age 16 who are employed or looking for work. This is consistent with the Bureau of Labor Statistics' definition of the labor force. It is different, however, from the definition used by some other authors (for instance, those who may focus on the population of workers aged 25–64).

40 The Census Bureau provides high and low projections of future net migration, which includes both authorized and unauthorized immigration as well as emigration. We take the average of the two in this analysis.

Exhibit 19

The US labor force will grow to 168.9 million by 2020

Sources of labor supply growth, 2010–2020
Million



SOURCE: US Bureau of Labor Statistics; National Center for Education Statistics; US Census Bureau; McKinsey Global Institute analysis

The rest of the gains will come from the potential return of discouraged workers to the labor market. As previously noted, the labor force participation rate has fallen—even for prime working-age Americans (those aged 25–54)—since the 2008 recession began. As the economic recovery takes hold, these people may again seek work, which could result in the return of 1.5 million discouraged workers to the labor supply.

On the other side of the ledger will be 25 million Americans who exit the labor force in this decade, the majority of whom will be retirees. This estimate takes into account the effect of some members of the baby boomer cohort[41] postponing retirement and remaining in the workforce longer for financial reasons.

Even before the recent recession, McKinsey Global Institute research found that two-thirds of baby boomers were financially unprepared for retirement and planned to work longer as a result.[42] The 2008 financial crisis wiped out $11 trillion of US household wealth, including both real estate and financial assets. Even though the recent stock market recovery has trimmed that loss to about $8 trillion, people nearing retirement age still have an enormous savings gap to fill and as a result are working longer. This is one reason that the Bureau of Labor Statistics projects that the labor force participation of people over age 55 will rise.

US labor force in 2020 could range from 167 million to 171 million

Our projected labor force growth could vary under a number of alternative assumptions, resulting in a labor force of as few as 167 million people or as many as 171 million by 2020. The lower figure might be realized if the discouraged workers from the recession are not lured back into the labor force, or if net immigration into the United States is lower than expected, possibly because of policy changes.[43]

41 The baby boom cohort consists of people born between 1946 and 1964.

42 See McKinsey Global Institute, *Talkin' 'bout my generation: The economic impact of aging US baby boomers*, June 2008 (www.mckinsey.com/mgi).

43 See Appendix A for more detail.

The higher figure could result from even more boomers delaying retirement. We calculate that postponing the retirement age by a year on average would increase the size of the labor force by 2.4 million by 2020. Immigration could also be higher than we assume, according to the highest projections of the US Census Bureau; this could result in an additional 1.5 million members of the labor force by 2020.

THE EVOLVING COMPOSITION OF THE US WORKFORCE WILL AMPLIFY SKILL MISMATCHES

By 2020, the American workforce will be more diverse, older, and better educated. These are all potential strengths. But underlying these positive trends are worrisome signs that the skills of the US workforce will not neatly match the emerging needs of employers. Not enough people will have the skills or educational degrees that will be most in demand.[44] Our interviews reveal a broad range of potential skill shortages, from welders to engineers. At the same time, the supply of workers with less than a high school diploma will be far more than what is needed by employers. Finally, demographic shifts will challenge employers to become more flexible and redesign jobs to take advantage of the evolving labor force.

Rising educational attainment

By 2020, 34 percent of American workers[45]—or nearly 57 million—are projected to have a bachelor's degree or higher (Exhibit 20), up from 25 percent in 1995 and just 13 percent in 1970. At the same time, 20 million will have a vocational certificate or associate degree, a 30 percent rise, and 29 million others will have completed some college but not earned a degree.

When we compare these figures to job growth scenarios from Chapter 2, we see a shortage in the number of graduates with four-year college degrees.[46] In the high-job-growth scenario, in which 22.5 million jobs are created in this decade, we find that around 58 million jobs will require a bachelor's degree or higher. This exceeds the supply of graduates by 1.5 million (Exhibit 21).[47] And even this calculation assumes that there will be a college graduate with the right major and experience for every job opening—which, as we will see, is unlikely. One obvious way to narrow this gap is to improve college completion rates.[48]

---

44 For other academic papers on future skills shortages, see Anthony Carnevale, Nicole Smith, and Jeff Strohl, *Help wanted: Projections of jobs and education requirements through 2018*, 2010; Harvard Graduate School of Education, *Pathways to prosperity: Meeting the challenge of preparing young Americans for the 21st century*, 2011; and National Governors Association Center for Best Practices, *Degrees for what jobs? Raising expectations for universities and colleges in a global economy*, 2011.

45 Some authors argue that the United States needs to significantly raise the portion of the workforce with college degrees (for instance, to 50 percent or higher) to remain competitive with other advanced economies. Others, however, argue that even students with college degrees end up in jobs that do not require them. Our research finds a modest gap between the number of workers projected to receive a bachelor's degree or higher and the number that will be needed.

46 See Appendix A for more detail on our projections of degree attainment in 2020 and our projections of labor demand by educational attainment.

47 This gap is lower than that projected by some other academic researchers. Several factors account for these differences: first, we use a broader definition of the labor force (all workers age 16 and over, instead of the narrower definition of prime-age workers 25–54 years); in addition, we have included the impact of immigrants who enter the workforce and the educational attainment these immigrants bring. See Appendix A for more detail.

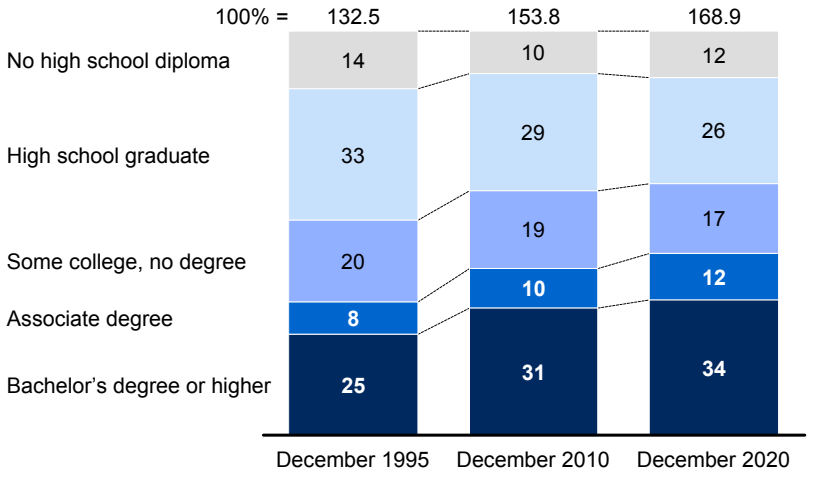
48 McKinsey & Company, Social Sector Office, *Winning by degrees: The strategies of highly productive higher-education institutions*, November 2010.

Meanwhile, despite the overall rise in educational attainment, there are still too many Americans who have only a high school diploma or do not even finish high school. In 2020, some 38 percent of US workers—or 64 million—will have a high school diploma or less. Our projections show that in 2020 there will be 5.9 million more high school dropouts than jobs for people with that level of education.

Exhibit 20

The portion of the workforce with a four-year college degree is projected to rise to 34 percent by 2020

Labor force by educational attainment, 1995–2020
%; million

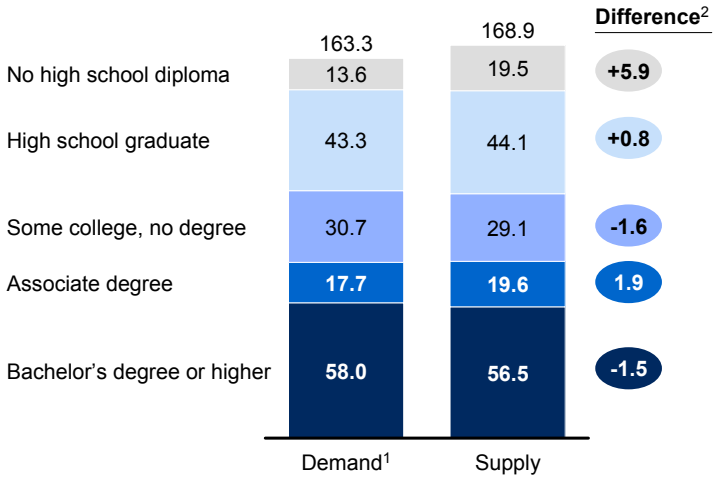


NOTE: Numbers may not sum due to rounding.
SOURCE: National Center for Education Statistics; US Census Bureau; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit 21

Labor demand and supply projections indicate 1.5 million too few college graduates in 2020

Demand vs. supply—2020 projections
Million



1 Labor demand from high-job-growth scenario.
2 2020 projected labor supply less 2020 job demand from MGI high-job-growth scenario.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

To appreciate the potential impact of more workers with minimal education in the labor force, recall that 78 percent of the unemployed today lack a postsecondary degree.[49] In the future, it will be imperative to increase the share of students who finish high school—and go on for additional training—no matter where they live or how poor their backgrounds. This is a challenge on which the United States has made too little progress.

In their book *The Race Between Education and Technology*, Claudia Goldin and Lawrence Katz demonstrate that when improvements in the US educational system outpaced the rate of technological change, as happened for more than 100 years up to around 1970, US economic growth was shared widely. When public education failed to keep up, income inequality started rising as job opportunities for high school dropouts declined sharply and employers competed for highly skilled workers. This is why the unemployment rate among college graduates is less than 5 percent, while the unemployment rate for high school dropouts is nearly four times as high.

Encouraging more high school graduates to get some form of postsecondary education is also important. Today, some high school graduates are lucky enough to land entry-level jobs in which they can get career skills through on-the-job training (for instance, machinists, carpenters, and executive assistants). Expanding opportunities for more high school graduates through vocational schools and community colleges is crucial. The odds of successful job matching also could be improved with a credentialing system that would let workers take standardized tests to demonstrate what they have learned in on-the-job training.

But growing skill mismatches, too

In addition to insufficient educational attainment, there are potential mismatches due to the fields of study that Americans who attend colleges and vocational schools today are choosing—choices that do not align with what employers are seeking. Employers in our survey say they are looking for job applicants with specific skills and work experience: 41 percent state that an educational degree in the right field is the key criterion they look for when hiring; 37 percent say relevant work experience is crucial.[50]

Already employers are having trouble filling some positions because they cannot find qualified applicants. Some 40 percent of survey respondents who say that they plan to hire in the next 12 months have had positions open for six months or longer because they could not find the right applicant. More broadly, nearly two-thirds report they routinely have openings that are difficult to fill. Of these, management was the most frequently cited type of position (particularly for companies in information industries). The most difficult occupational categories to fill were in science and engineering, followed by computer programmers and information technology workers (Exhibit 22). The growing shortage of workers with sought-after skills is reflected in compensation. Wages for engineers and architects grew by 3.5 percent annually from 2002 to 2009, compared with an average of 2.9 percent for all

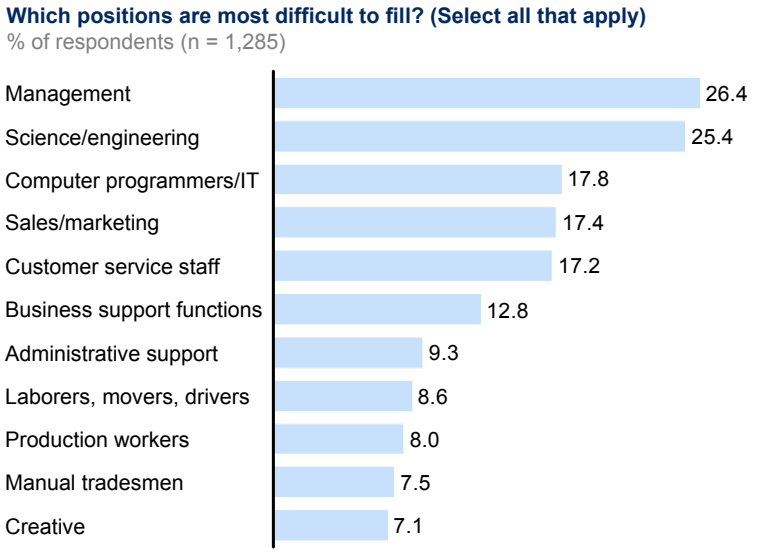
49 The labor force includes all working-age population (persons 16 years and older) classified as employed or unemployed in accordance with the US Bureau of Labor Statistics definitions. It is different, however, from the definition used by some other authors (for instance, who may focus only on the prime-age population of workers).

50 See Appendix B for more detail on our business survey results.

occupations.[51] A skill gap is also emerging among statisticians and mathematicians who can manage new "big data" systems that use vast amounts of information to drive a range of business activities.[52]

Exhibit 22

Companies report that positions in management, engineering, and computer programming are the most difficult to fill



SOURCE: McKinsey Global Institute US Jobs survey, 2011; McKinsey Global Institute analysis

Skill shortages are not confined to engineers, scientists, and computer programmers. Our interviews reveal a broad set of fields that require different levels of education—welders, nursing aides, nutritionists, and nuclear technicians—in which employers cannot find qualified workers. Improving the information available to educational institutions and students about the jobs that are growing rapidly and the requirements for those jobs will be critical to addressing the skill gap.

The current trends in choices of college majors will exacerbate the skill mismatch, too. The number of graduates in the STEM fields (science, technology, engineering, and mathematics) is growing only 0.8 percent annually, far lower than the rate in other concentrations (Exhibit 23). And, rather than apply their training in technical fields, many graduates in these disciplines head to careers in business administration or finance. At the same time, universities are projected to award twice as many business and social science undergraduate degrees as STEM degrees, as well as twice as many degrees in arts and literature as in health care fields. A similar mismatch in fields of study is occurring among students who earn vocational certificates and associate degrees.

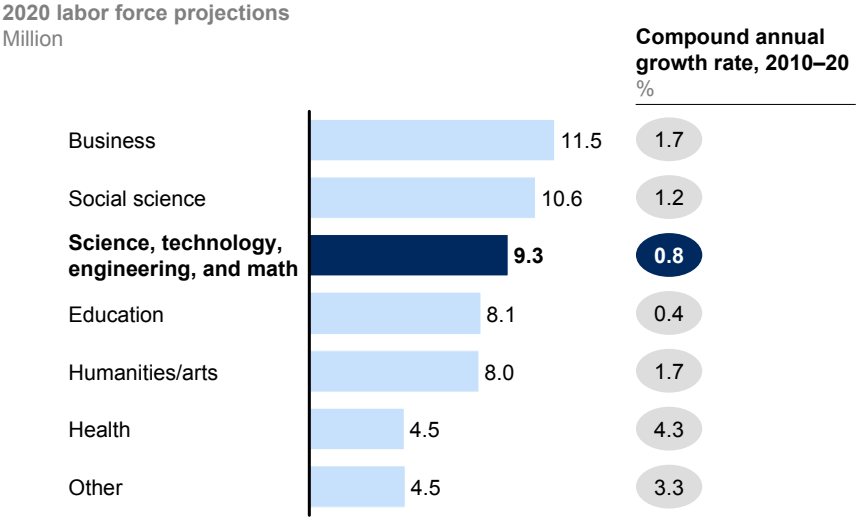
51 See McKinsey Global Institute, *Changing the fortunes of America's workforce: A human capital challenge*, June 2009 (www.mckinsey.com/mgi).

52 See McKinsey Global Institute, *Big data: The next frontier for innovation, competition, and productivity*, May 2011 (www.mckinsey.com/mgi).

Exhibit 23

The portion of degrees awarded in science, technology, engineering, and math is growing slowly

College graduates by specialization (bachelor's degree or higher) under current trends—2020 labor force projections



SOURCE: National Center for Education Statistics; US Census Bureau; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Demographic trends will require employers to respond creatively

In some ways, the evolving US labor supply may influence the kinds of jobs that are created. Employers will not completely reinvent jobs—except perhaps for the most sought-after talent—but they will change how work is done to accommodate the needs of the labor supply, as we will see in the next chapter.

The biggest force that employers will need to accommodate is the aging of the baby boomers. Even as boomers retire in greater numbers by 2020—when older boomers will be in their seventies—the number of workers in the labor force over 55 will double, to one in four from one in eight back in 2000. The challenge for employers will be to adopt creative approaches to balance the benefits of retaining the older, more experienced workforce with the need to advance the careers of younger workers and build a talent pipeline.[53]

One option may be to create new pre-retirement positions that will let older workers gradually reduce their work schedules rather than retire abruptly. This would enable younger workers to move up the ranks but still let the company harness the experience of its older workers. Remote work, mentoring positions, and part-time jobs may be parts of this solution, too.

The other factor that may require changes on the part of the employers is the growing need to keep women in their jobs and on track for advancement. Women now lead in educational attainment—in 2010, 58 percent of all bachelor's degrees were awarded to women and 53 percent of entry-level hires by corporations were women. However, at the very first move up the corporate hierarchy from solo performer to junior manager, the proportion of women drops—falling to just 37 percent in lower to

53 Peter Cappelli and Bill Novelli, *Managing the older worker: How to prepare for the new organizational order* (Cambridge, MA: Harvard Business Press, 2010).

middle management and just 27 percent at the vice presidential level.[54] According to new McKinsey research,[55] this attrition is due to many factors, including a tendency of women to drop out of corporate jobs or decide to forego advancement when they feel they cannot do their jobs well and at the same time take care of their family obligations.

Given the need for college-educated workers in the labor force, it will be in the interest of employers to develop more options that allow women to continue contributing. These include sabbaticals, job sharing, and—as we will see in Chapter 4—remote working. If women do not reach their full potential, companies will have to pull from an unnecessarily limited pool of potential leaders who can contribute to their success and also to the success of the US economy.

□ □ □

In the coming decade, investing in the talent of the US workforce will be critical to help fuel economic growth—and to restore full employment. US workers are known for their productivity, flexibility, and resilience. As the labor force grows, employers, public institutions—and workers themselves—will need to address growing skill gaps to unleash this fundamental source of competitive advantage.

54 See Catalyst, *Targeting Inequality: The Gender Gap in U.S. Corporate Leadership*, September 28, 2010. See also Rachel Soares, Jan Combopiano, Allyson Regis, Yelena Shur, and Rosita Wong, *2010 Catalyst Census: Fortune 500 women executive officers and top earners*, Catalyst, 2010; and Sylvia Hewlett, Kerrie Peraino, Laura Sherbin, and Karen Sumberg, *The sponsor effect: Breaking through the last glass ceiling*, Center for Work-Life Policy, 2011.

55 See Joanna Barsh and Lareina Yee, *Unlocking the full potential of women in the US economy*, McKinsey & Company, April 2011.

4. Anytime, anywhere: The changing nature of work

The changing nature of work in 21st-century America presents another set of issues and opportunities related to the jobs challenge. The old paradigm of a job for life with a single employer has faded into history. In this decade, we see that the traditional 9-to-5, Monday-to-Friday work week may fade, too—along with the traditional office and the customary relationship between employee and employer. For a growing proportion of the labor force, the jobs that workers find in the coming years—and those they hold now—may look nothing like what they are used to.

With the help of digital communications and advanced information systems, jobs are being disaggregated into separate tasks, and the work day is being sliced and time-shifted. The workplace is becoming virtual, with employees able to work anytime, anywhere. And their ability to work with colleagues and customers continents away in "real time" and perform almost any function remotely provides a whole new level of flexibility in how a company operates.

The full implications of restructuring jobs and shifting more work out of the office are not yet clear. However, we do see that some of the emerging work models will clearly create jobs in the United States. For example, low- and middle-skill workers may gain employment when higher-skill professional jobs are disaggregated into multiple tasks. And remote work opens up a whole range of possibilities, such as the opportunity to employ people who cannot relocate, commute, or work full time in their employers' offices. Another opportunity is to use satellite centers in low-cost US locations rather than sending the work offshore.

However, the new models also pose risks for US employment. The same digital infrastructure that makes it so simple for companies to hire remote employees in the United States also gives them access to global pools of inexpensive, increasingly high-quality talent. At the same time, the ability to manage remotely and reassign tasks dynamically across a network can help companies do more with part-time, temporary, and contingent workers, essentially engaging labor on an as-needed basis. For many Americans, this could make the quest for full employment even more difficult.

TECHNOLOGY DRIVES THE REINVENTION OF AMERICAN JOBS

Digital communications and information technology have been erasing physical barriers between economies for two decades and making possible whole new ways of doing business. Digital video and real-time collaboration tools are making it increasingly simple for employees who sit thousands of miles apart to work "side by side." Part of a job can be started this morning in one country and completed tonight by a colleague six time zones away—using the same tools and accessing the same information.

Mostly, this kind of virtual collaboration, time-shifting, and task-sharing has been used in service jobs, such as call centers and back-office functions, as well as

in some technical jobs, such as software development. Now, the same digital infrastructure is being deployed more broadly.[56]

Essentially, this extends the model of the global manufacturing supply chain to all kinds of work. Think about Apple Computer. It long ago vertically disintegrated and stopped employing its own manufacturing workers. Using its global network, Apple designs a new iPod model in California and India, sources components in Japan, and assembles the finished products in China—faster and more efficiently than it ever did in Cupertino.

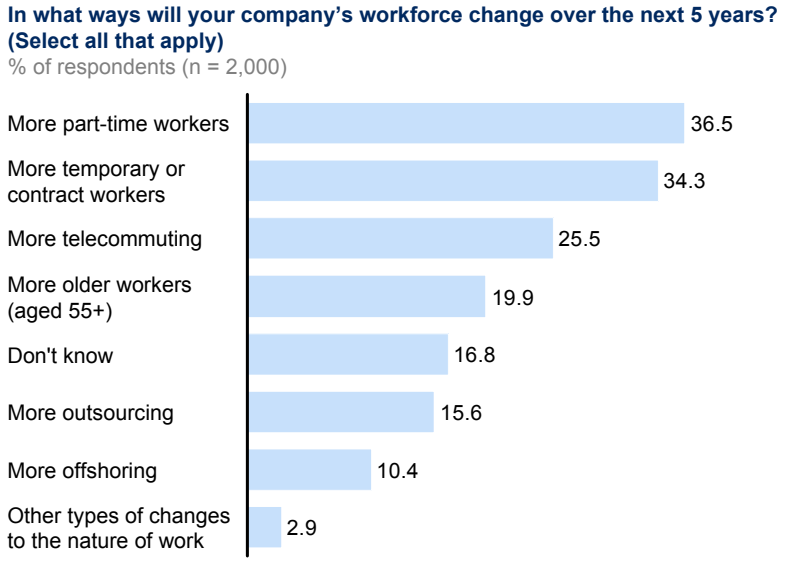
Today, the same global networks and IT tools make it possible to apply this model to all kinds of work. An insurance policy can be "manufactured" by an agent in Ohio, who submits an application to an underwriting system in Georgia that gathers rate information from a back-office system in India and passes the proposed policy back to a review and pricing expert in Nebraska, who approves the final product. Because this model can speed up the pace of business and innovation—as it has done in manufacturing—it may hold the key to greater innovation in services.[57]

THREE MODES OF CHANGE: DISAGGREGATION, VIRTUALIZATION, AND FLEXIBLE SUPPLY

Using the digital platform, the companies we interviewed and surveyed say they are now modifying work in at least three new ways: by disaggregating jobs; by relying more on remote employees; and by engaging labor in ways that give them vastly more flexibility in supply.[58] And many executives say they expect to increase use of these new ways of working (Exhibit 24).

Exhibit 24

Our survey reveals that employers foresee a more flexible labor force



SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

56 See Andrew McAfee, *Enterprise 2.0: New collaborative tools for your organization's toughest challenges* (Cambridge, MA: Harvard Business School Press, 2009).

57 See Erik Brynjolfsson and Adam Saunders, *Wired for innovation: How information technology is reshaping the economy* (Cambridge, MA: The MIT Press, 2010).

58 See Appendix B for more on the business survey results.

The disaggregation of work

Since Adam Smith's pin factory, breaking down complicated processes into simpler tasks has led to significant productivity improvements and rising standards of living. Today, companies are starting to use technology to embark on a new wave of disaggregation, by breaking down many kinds of jobs into discrete tasks that can be parceled out to employees, either in the same building or far away.

"It's no longer about one person doing ten tasks; it's more like ten people contributing to one function, each with a specialized task," an employer told us. For example, in many companies the classic human resources function has been broken into specialties such as compensation, recruiting, and benefits administration; meanwhile, the routine parts of the job—processing new-hire paperwork, adjusting benefits—have been automated with online self-service systems or moved to lower-cost locations. What can be disaggregated will be. And, often, what can be disaggregated can be outsourced or offshored.

But disaggregation is not always about de-skilling and eliminating jobs. In some scenarios, disaggregation of very high-skill professional jobs can actually create new middle-skill, middle-income specialties. For example, a proposed solution to soaring health care costs and the growing shortage of primary care physicians involves separating the less technical parts of a physician's job and reassigning them.[59] This might mean training and hiring a new cadre of community health workers to administer routine tests, such as for strep infections, or to administer flu shots. Nurse practitioners and physician assistants can also be trained to take on some tasks physicians now perform. Similarly, some skilled nursing jobs can be disaggregated.

In this process, jobs are created and the higher-skill professional gains time for more valuable work—in the doctor's case, diagnosing, managing care, and counseling. There are other potential benefits as well. A McKinsey study of Primary Care Trusts in the United Kingdom found that reversing the current 60:40 ratio of doctors to other employees in primary care clinics would be more efficient and raise the quality of care.

In the United States, disaggregating primary care could reduce growth in health care spending while opening up new jobs for people with less than a four-year college degree—if professional practice regulations can be updated to allow such innovation.[60] This type of shift has already occurred in the legal profession. Jobs for paralegals and legal assistants have grown 2.5 times as quickly as for attorneys in the 2000s, shifting the overall composition of employment in the sector.

To understand how disaggregation may affect different types of employees, it is useful to look at the types of tasks that current jobs involve. To do this, we use a framework that provides a view of the level of interaction involved in work and the skills required (see Box 5, "Mapping work: Production, transaction, interaction").[61] Over the past decade, for example, we see that the majority of job growth in the

59 The higher cost of physician office visits is one reason why the United States spends $650 billion more annually on health care than other OECD countries. See McKinsey Global Institute, *Accounting for the cost of US health care: A new look at why Americans spend more*, December 2008.

60 Currently, state-level "scope of practice" laws regulate the specific services that can be provided by different types of health care workers.

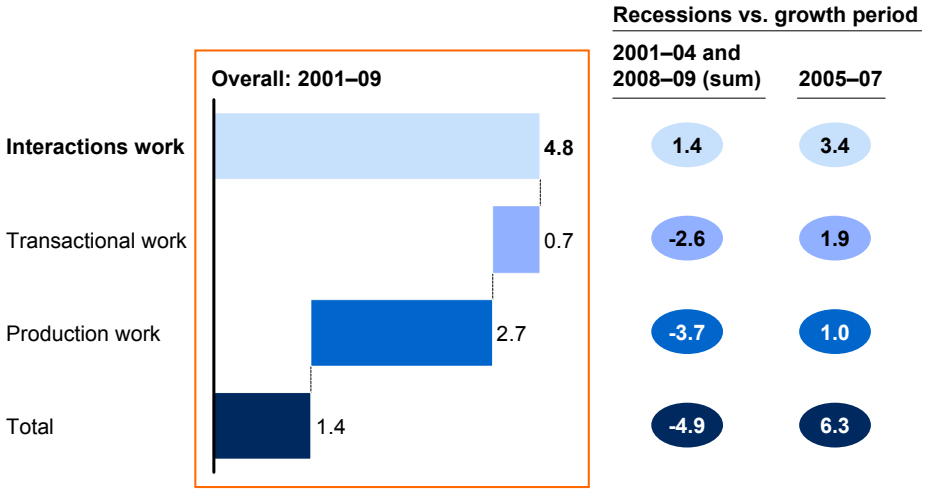
61 See Bradford C. Johnson, James M. Manyika, and Lareina A. Yee, "The next revolution in interactions," *McKinsey Quarterly*, November 2005.

United States has come from jobs involving complex interactions with other people (Exhibit 25) and that the least interactive tasks—simple production work and routine transactions (i.e., taking bank deposits)—are most likely to be automated, outsourced, or offshored.[62]

Exhibit 25

In the 2000s, the majority of job creation was in fields involving complex interactions

New jobs created in the United States
Millions of employees



SOURCE: US Bureau of Labor Statistics; Bradford C. Johnson, James M. Manyika, and Lareina A. Yee, "The next revolution in interactions," *McKinsey Quarterly*, November 2005; McKinsey Global Institute analysis

Virtualization: Anytime, anywhere work

Jobs in America are also becoming more virtual, meaning they can be performed equally well from any location—from home offices or from remote centers set up in low-cost parts of the country.[63] Many employers told us that they began offering work-from-home flexibility primarily to attract and retain women. Corporate America still has a difficult time keeping talented women, as we noted in Chapter 3, often because women opt out of corporate jobs or stop advancing when they feel they are unable to do justice to both their careers and their families. "If we make work more flexible and virtual, we can attract women," one executive told us. Working remotely, mothers (and fathers) can cut out hours of commuting time and arrange their workdays around other obligations.

What works for parents also works for other types of employees. Human resources executives note that "Gen-Y" young professionals today want to have a better work/life balance from the start, and allowing them to work remotely provides the flexibility they seek. A recent survey found a 17 percent increase from 2006 to 2008 in the share of people working remotely at least one day a month.[64] In our own survey,

62 Economist David Autor identifies jobs that involve such tasks as "routine cognitive work" and documents declining employment for such positions. See David H. Autor, Frank Levy, and Richard J. Murnane, "The skill content of recent technological change: An empirical exploration," *The Quarterly Journal of Economics*, Volume 118, Number 4, November 2003.

63 See Thomas W. Malone, *The future of work: How the new order of business will shape your organization, your management style and your life* (Cambridge, MA: Harvard Business Press, 2004).

64 See WorldatWork and The Dieringer Research Group, *Telework trendlines 2009*, February 2009.

Box 5. Mapping work: Production, transaction, interaction

Our framework defines three categories of occupations, and the levels of education and training required for each one. Production occupations involve the conversion of materials into finished products and range from low-skill jobs such as food preparation to more highly skilled jobs such as semiconductor equipment manufacturing. Transaction occupations primarily involve exchanges that are rules-based, and many of these exchanges can be scripted, routinized, or automated. These include cashiers, receptionists, and bank tellers as well as highly skilled positions such as accountants, programmers, and medical technicians. Jobs that involve a high level of interaction with other people and independent problem solving to respond to complex situations are referred to as interaction occupations. Examples include professionals, such as doctors and lawyers, as well as some jobs requiring less formal education, such as nursing home aides, corrections officers, and teaching assistants (Exhibit 26).

Technology affects each of these categories differently. It often has a capital-deepening effect on production and transaction work—for instance, by giving people power tools—but it sometimes can be a substitute for labor. For other transaction jobs, technology can lead to automation, given the routine nature of the work. For interaction jobs, technology almost always complements employee capabilities rather than replacing them.

This framework can help us pinpoint which jobs are likely to be disaggregated, virtualized, or offshored. Many of the highly skilled interaction jobs, such as lawyers or physicians that require professional training and cannot be performed well remotely, are ripe for disaggregation. As these jobs are broken down into more specialized tasks, the newly created positions will require less education, and some may be filled by virtual employees working remotely. Middle-skill transaction jobs, such as executive assistants, may be susceptible to virtualization, too. Many of the lower-skill production and transaction jobs, such as food preparers, food servers, and inspectors, are unlikely to be further disaggregated, automated, or offshored. One explanation for continued job growth in health care and education is that so many jobs in those sectors—across skill levels—are interactive, and job growth is driven by increasing demand for these services.

Exhibit 26

2010 employment is concentrated in high-skill interaction work and moderate- to low-skill transaction work

0–5% | 5–10% | >10% | % of total employment

Typical education required	Production (13%)	Transaction (39%)	Interaction (48%)
No high school diploma	▪ Construction assistants ▪ Drywall or tile installers ▪ Food preparation 3	▪ Maids ▪ Grounds maintenance staff ▪ Cashiers 5	▪ Security guards ▪ Day care workers 2
High school diploma	▪ Food prep/service ▪ Construction foremen ▪ Carpenters 6	▪ Stock clerks ▪ Cashiers ▪ Janitors 14	▪ Nursing aides ▪ Child care workers ▪ Telemarketers 9
Some college, no degree	▪ Construction inspectors ▪ Machinists ▪ Restaurant cooks 2	▪ Bookkeeping clerks ▪ Secretaries ▪ Photographers 9	▪ Customer service representatives ▪ Medical assistants ▪ Purchasing agents 8
Associate or postsecondary vocational degree	▪ Welders ▪ Semiconductor processors ▪ Jewelers/stone workers 1	▪ Drafters ▪ Radiology technicians ▪ Electrical technicians 4	▪ Dental hygienists ▪ Therapist assistants ▪ Computer support technicians 5
Bachelor's degree or higher	▪ High-tech manufacturing 1	▪ Accountants ▪ Computer programmers ▪ Loan officers 8	▪ Teachers ▪ Engineers ▪ Lawyers 24

NOTE: Numbers may not sum due to rounding.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

26 percent of executives reported that they expect to employ more people working from home over the next five years, two and a half times as many as said they would increase offshoring (see Exhibit 24).

Companies are also offering virtual work options to retirement-age Americans who have valuable skills they wish to retain or to retirees looking to supplement their incomes with flexible work. A large financial services firm hires retirees from all sorts of professions to answer customer service calls from their homes for several hours a day. The results have been excellent, a company executive told us, and the company intends to expand the program: "We like the fact that boomers want to work longer," he said.

The combination of technology and motivation, it seems, makes remote employees at least as productive as their colleagues in the office. Human resource executives whom we interviewed report that virtual employees are more productive and more satisfied, because their jobs give them autonomy and flexibility.

Now, companies are finding that by factoring in lower real estate costs and higher productivity, it can be nearly as efficient to use home-based employees in the United States as it is to contract with outsourcing vendors in some offshore locations (Exhibit 27). One professional services company found that using remote administrative assistants in their Midwestern homes was cost-neutral compared with using administrative assistants in India. A key reason was the higher productivity of the US workforce. "Given the availability of broadband today, we expect many administrative positions in the US to shift to virtual home-based workers over the next ten years," noted one executive.

Virtual work for some companies has become the rule, not the exception, in some functions. At JetBlue, 6,000 of the airline's 8,000 reservation agents work from their homes in the Salt Lake City area. After a few weeks of training, they are given the technology to set up a home office. The company reports that these agents are highly satisfied and productive. And the company has found that the home-based employees are more flexible: if there is a spike in calls (which the company monitors centrally), it asks for volunteers to log on quickly. When call volumes are low, the company can ask for volunteers to log off.[65] An insurance company we interviewed now employs several thousand claims processors who work from home. The company enjoys substantial real estate savings, and these employees have lower turnover and report higher job satisfaction than other claims processors.

A new breed of outsourcing companies has sprung up in the United States to help corporations tap the home-based workforce. These "phone-sourcing" or "home-sourcing" companies will hire, train, and manage home-based employees across the country.[66] Clients include telecom companies and even retailers, which use these contractors as virtual call centers.

Remote and home-based work has the potential to overcome one of the more vexing matching challenges we discussed in Chapter 1—getting people in high unemployment areas to connect with jobs. With the right training, a headset, and a broadband hookup, a laid-off bank employee in Nevada who cannot sell his home can virtually relocate to work for an employer in an economically healthier region of the country.

---

65 Sharon Gaudin, "Telecommuting takes flight at JetBlue," *Datamation*, March 3, 2006.

66 See Jeremy Caplan, "Phonesourcing: Bringing call centers back to the U.S.," *Time*, April 5, 2010.

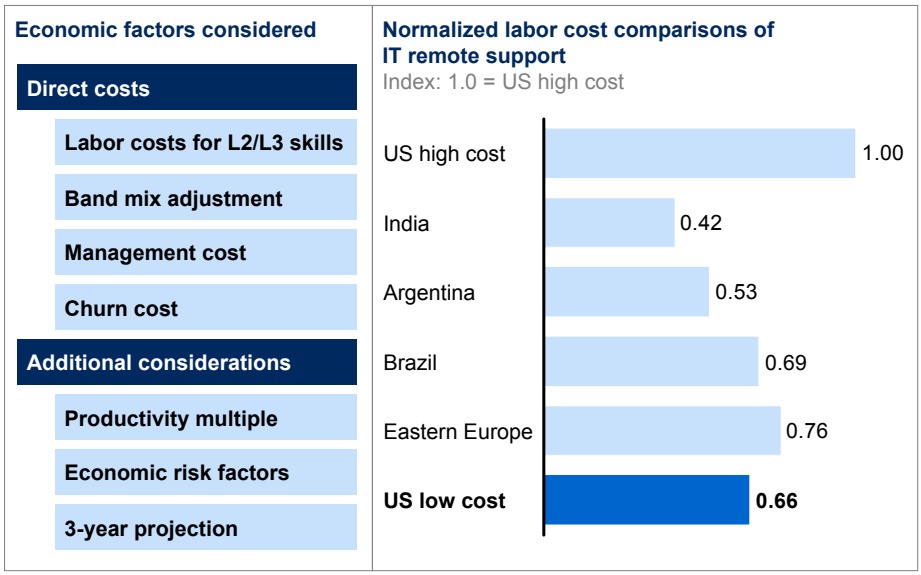
Increasing flexibility of labor

An employment landscape of virtual workers and disaggregated jobs—with resources always available across an Internet connection—gives employers unprecedented flexibility to deploy labor more precisely. Often this means more use of part-time schedules or hiring only on a temporary or contingent basis.

Partly because of concern over the strength of the economic recovery and over potential regulatory and tax changes, many executives we interviewed and surveyed are cautious about hiring full-time employees in the United States. As a consequence, in 2010 almost 25 percent of the 1 million nonfarm jobs that were created were part time, and 27 percent were temporary. Part-time employment, as a share of total employment, is higher than at any time since 1980 (Exhibit 28).

Exhibit 27

Higher-level IT support services in the US can be cost-competitive with offshoring destinations

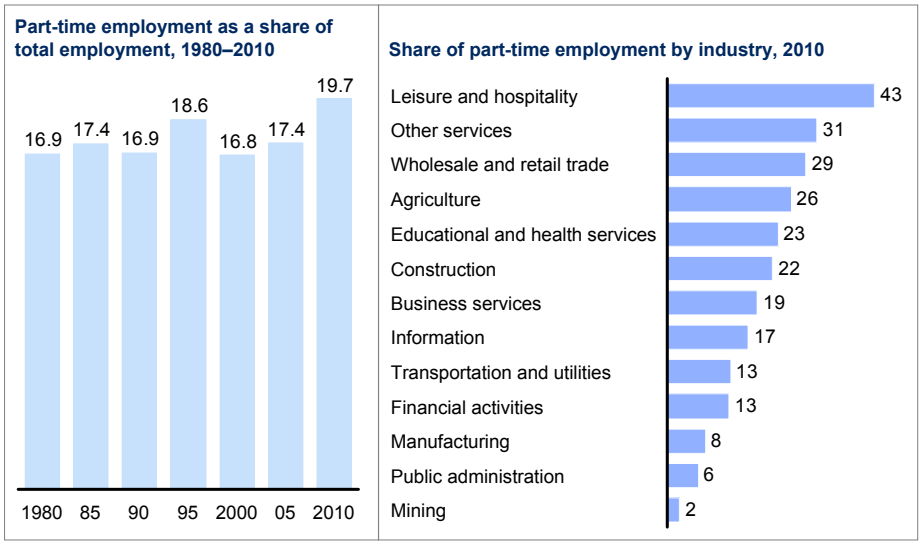


SOURCE: McKinsey & Company; McKinsey Global Institute analysis

Exhibit 28

The share of part-time jobs in the economy is at the highest level since 1980

%



SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

In our interviews, employers were clear about their intentions to continue hiring contingent and part-time workers: "We will increase jobs over the next five years but keep FTEs [full-time equivalents] flat," said one executive. "From the employers' perspective, contingency workers enable the company to better target peak demand and also reduce labor costs." In our survey, 58 percent of employers said one of the key trends in their hiring will be the use of temporary, contract, and part-time employees (see Exhibit 24).

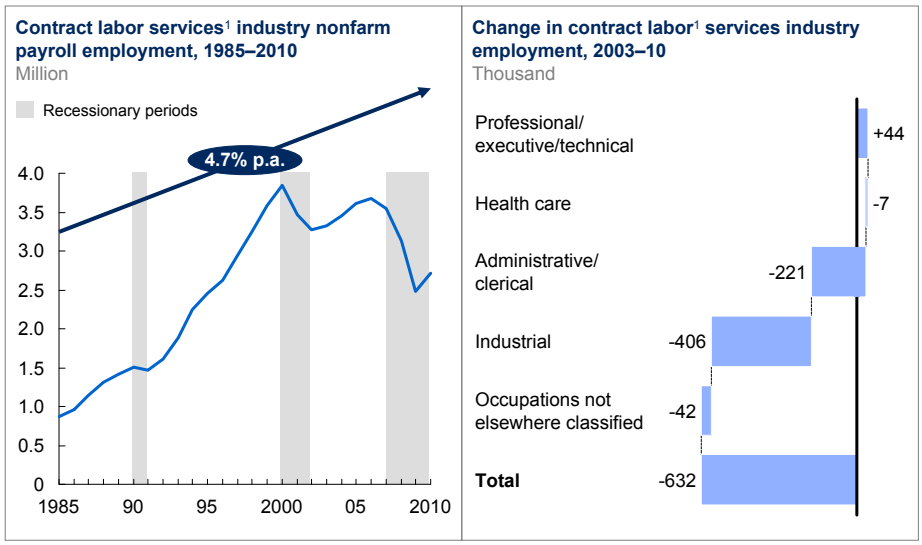
Again, with technology leading the way, some companies are going a step further than traditional contingent arrangements to get what amounts to labor on demand. A major health care provider, for example, has adopted a scheduling program that lets hospitals hire nurses by the hour rather than in full eight-hour shifts. Hourly work had been an option that some nurses wanted; under this staffing model, it is a condition of employment. Overall, we see strong growth in part-time positions in sectors with lower productivity growth, such as education, health care, retail, and leisure and hospitality (Exhibit 29).

The use of temporary employees in the United States is also changing. In decades past, most temps were in positions such as administrative assistants, production line workers, or in processing jobs. Today, a growing share of temporary employees are in occupations such as human resources, accounting, and even engineering. From 2003 to 2010, there was a net gain of 44,000 contract workers in high-skill professional and technical services, despite an overall loss of more than 600,000 jobs in the contract labor sector (Exhibit 29).[67]

The extent to which this trend continues once the economic recovery gains greater momentum remains to be seen. With today's high unemployment, it is easy to hire temporary and part-time employees with the necessary skills, but fewer people may be willing to take such positions once full-time jobs are more abundant.

Exhibit 29

The mix of contract workers is shifting toward high-skilled professions



1 Contract labor consists of all employment services industries, including job placement agencies, which account for ~10% of total employment services.

SOURCE: American Staffing Association; US Bureau of Labor Statistics; McKinsey Global Institute analysis

67 The overall decline reflects the 2008 recession, in which many contract workers were laid off.

IMPLICATIONS FOR EMPLOYERS, WORKERS, AND POLICY MAKERS

For employers, the disaggregated and virtual workplace offers flexibility and cost savings, but it also requires new management approaches. To manage employees in multiple locations performing all those disaggregated tasks demands a whole new level of coordination. Standardized task interfaces and efficient communication and data sharing among individual employees allow the system to function. The challenge for management is to find ways to observe, measure, and improve this complex series of interactions. Clearly, there are risks. "You save money, but you lose control over the person," said one executive. "We're worried about employee loyalty, about their identification with the company."

American workers will be challenged in unprecedented ways. To get one of the new, disaggregated jobs, a person will need specific "job-ready" skills. An executive at one company told us, "With our move to contingent workers, we need people that can come in at short notice and immediately begin work—this usually means people with specific skills and experience."

To function in these fluid work situations and carry out their assignments, employees will also need communications and collaboration skills; they will need to interact directly with many people across parts of a disaggregated value chain. Building a career and attaining necessary skills from part-time and temporary work will also be a challenge. For example, it is not clear how people will receive training for these new jobs and who will pay for it, raising a number of important issues.

There are also implicit policy issues. Workers who shuttle from one part-time job to another, as they piece together the equivalent of a full-time paycheck, will be outside the traditional employer-based benefits system. These workers may face challenges in acquiring health insurance and building retirement savings.[68]

□ □ □

The forces of change that are reshaping how work is done will not abate. As technology advances and companies and workers adopt new tools, jobs will evolve in ways that we cannot fully anticipate. However, we also see that there is great opportunity in these new modes of work. It will be up to the resourcefulness of the US workforce and the creativity of employers to make that happen.

68 The Freelancers Union (www.freelancersunion.org), an advocacy group made up of contingent workers that now has 155,000 members, has addressed some of these issues, including providing members access to health coverage at group rates.

5. Toward a US jobs agenda

Sustained and robust GDP growth is a prerequisite for a return to full employment. However, the US jobs challenge today stems from a pattern of jobless recovery that does not conform to the classic cyclical view of recession and recovery. So while healthy GDP growth will be essential, it will probably not be sufficient.

As we have discussed, failure to reverse the anemic job growth of the past decade and to accelerate job creation in the years to come will have serious consequences for the future of the economy and the American people. For the United States to remain a high-income, globally competitive nation, it will need to set the conditions for demand-driven growth and job creation. Our research indicates that progress on four dimensions is needed:

- **Skill:** ensuring that Americans acquire the skills that match employer needs
- **Share:** helping American workers win "market share" in an expanding global economy
- **Spark:** encouraging innovation, new company creation, and the scaling up of new industries in the United States
- **Speed:** removing impediments to investment and job creation

In this chapter, we describe why these four themes are critical (Exhibit 30). There are many ways to make substantive progress on each dimension, and we invite others to contribute specific ideas for solutions. Indeed, we hope to advance the national conversation on jobs by offering this framework for the solutions.

One thing is certain: "business as usual" will not solve the employment challenge that the United States faces. All parties to this debate—government, business, educational institutions, and workers themselves—will need the courage to consider new approaches. Other nations have reversed declining employment by attacking its causes directly and adopting solutions appropriate to their unique circumstances (see Box 6, "Germany's approach to employment"). The American employment challenge will require American solutions based on fresh thinking. As Peter Drucker warned, "The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic."

Exhibit 30

The impact of different policy solutions varies by sector

High | Moderate | Low | MGI focus

Sector	Job growth potential[1], 2010–20 Million	Employment, April 2011 Million	Skill	Share	Spark	Speed
Business services	>3	17.1	High	High	High	Low
Health care	>3	16.7	High	Low	Moderate	High
Leisure and hospitality	>3	13.2	Low	Moderate	Moderate	Moderate
Construction	1–2	5.5	Low	Low	Moderate	High
Retail	1–2	14.5	Low	Low	Moderate	Low
Manufacturing	<1	11.7	Moderate	High	High	High
Finance	<1	7.6	Low	Moderate	Low	Low
Other services[2]	<1	5.4	Low	Low	Moderate	Moderate
Transportation	<1	4.2	Low	Low	Low	Moderate
Education (private and nonprofit)	<1	3.2	Moderate	Moderate	Moderate	Low
Media and information	<1	2.7	Moderate	Moderate	Moderate	Low
Utilities	<1	0.6	Low	Low	Low	Moderate
Government	1–2	22.2	Low	Low	Low	Low
New industries[3]	n/a	n/a	Moderate	Moderate	High	High

1 Job growth for the first six sectors listed comes from the MGI high-job-growth scenario described in Chapter 2. For all other sectors, job growth is taken from Moody's Analytics.
2 Other services includes repair and maintenance, personal care, and religious and nonprofit organizations.
3 Emerging new industries that are currently very small but could potentially grow very large, such as telecom and Internet businesses in the 1990s.

SOURCE: Moody's Analytics; McKinsey Global Institute analysis

Box 6. Germany's approach to employment

Germany has chosen a different approach to employment, preferring to subsidize employment rather than to pay for unemployment benefits. As a result, while it suffered a 50 percent larger drop in GDP than the United States in the recent recession, its unemployment rate remained essentially flat.

Several specific policies illustrate Germany's commitment to keeping workers in jobs. A series of labor policy reforms enacted in 2003–2005 (the so-called Hartz laws) simultaneously deregulated the labor market and created new mechanisms to help workers. One is the "mini job" program, which creates opportunities for students, retirees, and others who are not working full time to work up to 15 hours per week at a set pay rate. An "integration subsidy" targets the long-term unemployed: when companies hire a worker who has been unemployed for more than a year, the government pays up to 50 percent of the wages for two years.[1] Finally, Germany retooled its local labor agencies to boost effectiveness and efficiency. By carefully segmenting the unemployed population, it has been able to create more targeted actions and clear performance goals for getting workers back in jobs.

When the 2008 recession hit, Germany relied on *Kurzarbeitergeld*, a system created in the 1970s that permits an employer to apply for subsidies to keep workers on the payroll. In 2008, the government raised the limit on short-time payments from 6 months to 24 months (the limit has since been reduced to 18 months).

Proposals for providing "wage insurance" for US workers, similar to German policies, have been discussed for years.[2] In light of Germany's successful employment experience in recent years, it might be time to reconsider such proposals.

1 There are several other criteria for the integration subsidy, including a worker's age.

2 One proposal takes a note from Germany, offering a plan to subsidize wages of workers who leave the unemployment insurance system to take jobs that pay less than their previous employment. See Jeffrey R. Kling, *Fundamental restructuring of unemployment insurance: Wage-loss insurance and temporary earnings replacement accounts*, Brookings Institution, September 2006.

SKILL: DEVELOP THE WORKFORCE OF TOMORROW

Neither students nor experienced workers looking for new opportunities are served sufficiently by current educational and training institutions, as we discussed in Chapter 3. Although the United States spends more than $300 billion annually on postsecondary education and job training programs, employers still have trouble finding workers with specific skills. And many students lack a clear picture of which jobs and skills will be in high demand.[69]

While reforming the primary and secondary education systems remains a top long-term priority, there are shorter-term solutions, too. Employers can play an essential role, by helping educational institutions define and certify needed skills. In our interviews, we spoke to executives whose companies have worked with community colleges and vocational schools to design curricula and to ensure that students have job-ready skills. New consortia are emerging to define industry skill adders, which will allow workers to demonstrate their competencies, whether learned in school or on the job. At the same time, a national database of jobs, requirements, and salaries could vastly improve how students, workers, and educators identify and prepare for jobs of the future. Targeting more scholarships, financial aid, and other support to students in technical fields such as engineering, science, and mathematics could also help ease the looming shortages in those fields.

SHARE: HARNESS GLOBALIZATION TO CREATE MORE US JOBS

Despite the recent financial crisis, the global economy is booming and, for the most part, US companies have adapted and thrived. As consumers, Americans have benefited greatly, but as workers, much less so. It is time to find ways in which US workers can win "share" in a global marketplace. As one executive told us, in the global economy, "governments in other countries understand that the real currency is jobs."

Helping US workers win market share in the global economy is not about enacting tariffs and quotas or using other forms of protectionism. Rather, this is about policies that unlock global demand and investment to create jobs in the United States. For example, the United States could make foreign direct investment easier and more efficient. It could also make it easier for the rising middle class in emerging markets to visit the United States for leisure. Private players and public entities could help America's small businesses gain more visibility in the global export market. China's small manufacturers, for example, have benefited greatly from aggregators that help them attract and serve foreign customers. Finally, to encourage the nascent onshoring movement, states and localities could provide more complete information on the economics of setting up remote service centers in their areas.

SPARK: GROW EMERGING INDUSTRIES AND NEW BUSINESSES, AND REIGNITE INNOVATION

To achieve the high-growth scenario of 22.5 million jobs that we described in Chapter 2, it is critical that the United States support emerging industries and revive the rate of new business creation. Equally important, it must create an environment in which innovations created in the United States are scaled up to become new industries in the United States. In recent years, many innovations born in US research labs became industries—and jobs—elsewhere (e.g., photovoltaic coatings for solar

69 See McKinsey & Company, *Winning by degrees: The strategies of highly productive higher-education institutions*, November 2010.

panels). And finally, the United States must reignite innovation in businesses, both large and small. This will help drive productivity growth through expanding demand, as we saw in the 1990s, rather than through efficiency gains alone, as we saw in the last decade.[70]

There are many ways to promote a high-spark economy. Improving the flow of capital to new businesses and translating the lessons of successful innovation hubs to other metropolitan areas should be top priorities. Policy makers can support the emergence of new industries by using the power of the government to set standards and to create pricing mechanisms, and by using government purchases to provide early-stage demand for new technologies. States and localities can do more to support collaboration between university researchers and businesses to help ensure that ideas coming out of their research labs spawn new companies—and jobs—in the United States. As former Intel Chairman Andrew S. Grove writes, "A new industry needs an effective ecosystem in which technology know-how accumulates, experience builds on experience, and close relationships develop between supplier and customer."[71]

SPEED: CLEAR THE PATH FOR INVESTING AND HIRING

While conducting our research, we have heard a relatively new and disturbing theme from some companies: they hesitate to invest in the United States because of the complexities, real or perceived, of existing regulations and regulatory processes. While the United States remains one of the top business environments in the world, other nations have caught up (Exhibit 31).[72] In many cases, an array of land use rules—combined with an inconsistent and sometimes lengthy process to decide which regulations apply—adds months or even years to timelines. A project that might require less than a year to build could first take many years to be approved. According to the World Bank, the United States has fallen to number 27—behind Thailand and Saudi Arabia—on ease of getting a construction permit.[73] This discourages investment from US or global companies in "greenfield projects"—and job creation.

Of course, regulations reflect important environmental, safety and land-use concerns, and job creation will never be the only objective. However, without changing substantive environmental or zoning rules, the United States could meaningfully shorten the time it takes to approve or reject a project, thus reducing uncertainty and encouraging investment. One approach would be to streamline the process of decision-making by applying the lessons of "lean operations." Another might be a new type of enterprise zone which would emphasize speed rather than tax incentives, and offer some preapproved environmental and land-use permits. The federal government could work with willing state and local governments to ensure consistency in permitting and enforcing other regulations across all levels of government as well.

---

70 See McKinsey Global Institute, *Growth and renewal in the United States: Retooling America's economic engine*, February 2011.

71 Andy Grove, "How America can create jobs," *Bloomberg Business Week*, July 1, 2010.

72 See McKinsey Global Institute, *Growth and competitiveness in the United States: The role of its multinational companies*, June 2010.

73 See World Bank and International Finance Corporation, *Doing Business 2011: Making a Difference for Entrepreneurs* (Washington, DC: World Bank, 2010).

At the same time, in some sectors, job creation is held back by outdated regulations over how services are provided and by what type of worker. For example, scope of practice laws that delineate how health care services are delivered vary across US states—and are often very different from the rules in other advanced economies. Without sacrificing the quality of care, revising such laws could open the door for rapid growth of middle-skill jobs in health care. In places with revised scope of practice laws, health care practices employ a whole range of care providers in addition to physicians, including nurse practitioners, physician's assistants, and community health workers. Similar restrictions affect many service industries, and revising them could create new jobs in these sectors.

Exhibit 31

US performance on business environment is declining relative to other countries

Leader
Top quartile
Average
Bottom quartile

	Key metrics	US relative position: 10 years ago	US relative position: Today	Trend
Economic fundamentals	Household consumption	Leader	Leader	▼
	Household consumption growth	Leader	Top quartile	▼
	GDP	Leader	Leader	▼
	Stock market capitalization	Leader	Leader	▼
	Industrial production	Leader	Top quartile	▼
	Trade as % of GDP	Average	Average	▼
	National spending on R&D	Average	Average	▼
Business climate	Statutory corporate tax rate	Average	Bottom quartile	▼
	Business environment	Leader	Top quartile	▼
	FDI as % of GDP	Average	Average	▼
	Growth of local innovation clusters	Leader	Leader	▬
	Tax incentives for R&D	Top quartile	Average	▼
Human capital	Population and demographic profile	Top quartile	Top quartile	▬
	Availability of high-quality labor	Leader	Leader	▼
	Retention of foreign-born talent	Leader	Leader	▬
	Cost-adjusted labor productivity	Average	Average	▬
	Public expenditure on education	Leader	Leader	▬
	Number of patent applications	Leader	Top quartile	▬
Infrastructure	Transportation	Leader	Top quartile	▼
	Telecommunications	Leader	Top quartile	▼

SOURCE: McKinsey Global Institute, *Growth and competitiveness in the United States: The role of its multinational companies*, June 2010; McKinsey Global Institute analysis

IMPLICATIONS FOR GOVERNMENT, POLICY MAKERS, BUSINESS, AND WORKERS

High skill, high share, high spark, high speed: it's a recipe for success for the US economy, American corporations, small businesses, ambitious entrepreneurs, consumers, and workers. Any specific policy solution in each of these areas will have intelligent detractors, who will point to other priorities and offer legitimate reasons for caution and delay. Yet, if the United States allows job creation to be merely a byproduct of other policy choices—rather than a high priority in its own right—then jobless recoveries will indeed become the "new normal." In pursuit of solutions, US institutions will need to be agile, open-minded, and focused on results. This has implications for government, business, and citizens.

- **Government and policy makers:** Governments at all levels can have an immediate impact on US job creation by fixing how existing regulations are administered. That means accelerating the speed of decision-making, eliminating redundancy, and improving interagency and intergovernmental cooperation—steps that make it easier for companies to pursue investment and expansion while following the rules. The federal government could also use pilots, waivers, and competitive grants to promote state and local efforts to streamline regulations, to overturn barriers to innovation, or to experiment with special economic zones.

Rather than rely primarily on tax incentives, states and municipalities should compete for business investment on the basis of their workforce skills, ease of regulatory compliance, and access to innovation ecosystems; the US should do the same at the national level. Finally, governments can use their influence to set standards and to create incentive structures that catalyze new industries.

- **Business leaders:** Ultimately, private-sector employers will be the main source of job creation, as they hire to support innovation, business expansion, and the pursuit of profit. US job creation will not be robust until more business leaders from around the world—and especially within the United States—fully understand the enormous potential of the US workforce. In recent years, rising foreign wages and transportation costs, coupled with increased supply chain risks, have made the United States a more attractive place to deliver services and to manufacture and source products than many corporations suppose. If more business leaders confirmed their willingness to invest and to hire in the US—and also worked collaboratively with public and nonprofit institutions to build the workforce and business environment they need—they could do a great deal to put the nation on a path to sustained growth and competitive advantage.

- **American workers:** Paradoxically, American workers have become less geographically mobile as the economy has become more global. Given the pace of "creative destruction" in the US and the global economy, American workers will need to adapt much faster to new industries, new skill sets, and new patterns of work than they have in the past. Substantial improvements are needed in how public schools, community colleges, vocational schools, and employers train the workforce. But the entrepreneurship, resilience, and commitment to continuous learning of American workers will play an essential role in renewing the vitality of our labor markets, too. They need better support, training, and information to adapt to the shifting economic opportunities and to remain one of the most productive labor forces in the world.

□ □ □

The current pattern of jobless recoveries has evolved over two decades, and reversing this trend will not be easy. It will take time to address the long-term challenges to US employment, and it will require major efforts in education, regulation, and even in diplomacy. However, it is important to start now—both to head off the worst effects of this jobless recovery and to lay the ground work for an innovation-driven, adaptive economy that will thrive on the talent of a globally competitive workforce.

Appendix A. Technical notes

These technical notes provide additional detail on the definitions and methodologies employed in this report. Specifically, the notes expand on the following points:

1. Establishing the relationship among GDP, productivity, and employment
2. Creating sector-specific job-growth scenarios
3. Determining future skill requirements
4. Projecting labor supply to 2020
5. Estimating college degree attainment

1. RELATIONSHIP AMONG GDP, PRODUCTIVITY, AND EMPLOYMENT

Production functions represent the relationship of an output to inputs, one of which is labor. Therefore, when thinking about job growth in this decade, we start with the relationship among labor, productivity, and GDP:

$$Y = (Y/L) \times L$$

where Y is real GDP output, Y/L is output per worker (or productivity), and L is the labor input (hours worked).

To determine how these parameters have evolved historically, the first derivative of this function gives us the rate of change for each parameter. The equation then becomes additive and allows us to express the rate of change in real GDP output as equal to the sum of the rate of change in productivity and the rate of change in the quantity of labor. We used the natural logarithm to approximate the derivative.[74] The additive form of the equation then becomes:

$$\ln Y = \ln(Y/L) + \ln L$$

This relationship shows us that changes in output will be composed of changes in productivity and changes in employment.

74 Strictly speaking, the natural logarithm of the variable only approximates the change in the value of the variable between two time periods; however, for small values, the approximation has a very small error. Any change in the natural logarithm is nearly equal to the percentage change in the underlying value.

2. CREATING SECTOR-SPECIFIC JOB-GROWTH SCENARIOS

The relationship described among employment growth, productivity growth, and GDP growth holds for individual sectors of the economy as well as for the economy in aggregate. We use this relationship to build job-growth scenarios by industry.

We start with industries defined at the two-digit NAICS (North American Industry Classification System) code level, dividing the economy into 23 distinct industries. We then reduce these industries into 16 sectors: agriculture, forestry, fishing, and hunting; mining, quarrying, and oil and gas extraction; utilities; construction; manufacturing; wholesale trade; retail; transportation and warehousing; information; financial activities; business services; leisure and hospitality; education; health care; other services; and government. Of these sectors, we focused on six that accounted for 66 percent of nongovernment US employment in 2010: health care, business services, leisure and hospitality, construction, manufacturing, and retail. These sectors are not only major employers today, but they also span the range from services to production, tradable to nontradable work, and high-skill to low-skill jobs.

We base our scenarios for potential job growth in these sectors on several inputs. First, we consider sector-level GDP and employment projections from macroeconomic forecasters, including Moody's Analytics, Global Insight, and the Bureau of Labor Statistics (BLS). Based on these forecasts, we can calculate the implied sector productivity growth (GDP per worker) of the forecast and compare it to the historic sector experience. We also check what the individual sector estimates imply about the economy's overall productivity growth to ensure that it is within the range of historical productivity growth and consistent with earlier MGI work on US productivity.[75] This gives us a plausible range for future output growth and productivity growth in each sector.

Next, we adjust these sector output and productivity growth figures using our own analysis of structural changes that are under way in each sector. We interviewed executives at more than a dozen firms within these six industries, as well as McKinsey's internal industry experts, to understand the most important sector-specific trends and their potential impact on sector productivity and demand in this decade. For example, in the health care sector, the 2010 Patient Protection and Affordable Care Act could expand insurance coverage by as many as 34 million Americans.[76] This may raise demand for health care services beyond what the current macro forecasts show. As another example, experts we interviewed in the retail sector believe that a large-scale move toward self-checkout could take place in the coming years, which would raise productivity growth.

---

75 See McKinsey Global Institute, *Growth and renewal in the United States: Retooling America's economic engine*, February 2011 (www.mckinsey.com/mgi).

76 The Centers for Medicare and Medicaid Services, Office of the Actuary, estimated in April 2010 that the number of uninsured Americans in 2019 would decline from 56.9 million to 23.1 million as a result of the Patient Protection and Affordable Care Act.

For each sector, we use these trends to develop a low-job-growth scenario, a high-job-growth scenario, and a midrange scenario (Exhibit A1). The specific assumptions for the low and high scenarios in each of the six major sectors are shown in Exhibits A2 and A3.

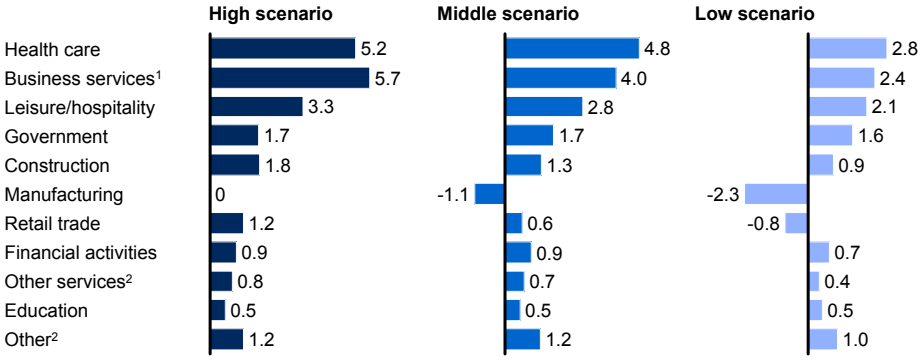
Finally, to obtain three overall employment scenarios for the US economy, we total the high-job-growth sector estimates, the low-job-growth estimates, and the midrange estimates. We do not factor inter-sector dependencies into these scenarios, nor do we factor in dynamic effects. However, we do use an adding-up constraint to ensure that top-line employment growth combined with a range of productivity growth estimates results in reasonable GDP growth assumptions for each scenario (Exhibits A4 and A5). To get total job growth, we use Moody's Analytics' employment growth forecasts for the remaining sectors of the economy. Moody's provides employment forecasts for seven economic scenarios; we take their lowest job-growth forecast for our low scenario, their "current" projection for our middle scenario, and their highest job-growth forecast for our high scenario.

These scenarios are not meant to provide forecasts of what will occur. Rather, they provide reasonable illustrations of how job growth could evolve and highlight the critical sectors and trends that will determine the outcome.

Exhibit A1

Scenarios for job growth by sector

Net job creation, year-end 2010–2020
Million



	High scenario	Middle scenario	Low scenario
Total jobs	**22.5 million**	**17.4 million**	**9.3 million**
Jobs per month	187,000	145,000	77,000
Compound annual growth rate, 2010–20 %	1.5	1.2	0.6

1 Business services includes professional, scientific, and technical services; administrative and support services; and waste management services.
2 Other includes mining, utilities, wholesale trade, transportation and warehousing, information, self-employed, and agriculture.
SOURCE: Moody's Analytics; Global Insight; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit A2

Key sector assumptions: Low-job-growth scenario

Change in jobs (million)

	Employment growth (%)		
	Historical, 1997–2007	Low, 2010–2020	Rationale
Health care	2.6%	1.6% (2.8)	▪ Health care spending is constrained, with little or no expansion of coverage for the uninsured ▪ Positive productivity growth of 0.4% annually, due to electronic medical records, automation, or outsourcing of routine tasks
Business services	2.3%	1.3% (2.4)	▪ Continued offshoring of administrative/back-office work; accelerated offshoring of higher-value-added jobs such as engineering and design ▪ Weak start-up activity reduces demand for domestic outsourcing
Leisure and hospitality	2.0%	1.5% (2.1)	▪ Sluggish consumer demand growth due to slow housing recovery, increased savings, and limited credit ▪ No improvement in foreign tourism
Retail	0.8%	-0.6% (-0.8)	▪ Sluggish consumer demand growth due to slow housing recovery, increased savings, and limited credit ▪ New wave of productivity gains from automation, such as self-checkout and RFID tagging in inventory management
Construction	2.8%	1.5% (0.9)	▪ Residential real estate market remains depressed, and housing starts stay below 1 million through 2015, then recover slowly ▪ Infrastructure spending falls because of fiscal constraints
Manufacturing	-2.2%	-2.2% (-2.3)	▪ Productivity growth and demand growth continue near historic rates (4.8% and 2.6%, respectively) ▪ Little or no change in offshoring of jobs ▪ Little or no change in US net exports of manufactured goods

SOURCE: Moody's Analytics; Global Insight; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit A3

Key sector assumptions: High-job-growth scenario

Change in jobs (million)

	Employment growth (%)		
	Historical, 1997–2007	High, 2010–2020	Rationale
Health care	2.6%	2.8% (5.2)	▪ Expansion of insurance coverage and aging population drive significant demand, with no significant constraint on spending ▪ Productivity growth is slightly higher than historic levels (0% vs. -0.6%), but there is no major productivity revolution
Business services	2.3%	3.0% (5.7)	▪ Offshoring of customer-facing functions reverses, and there is not a major wave of offshoring of higher-value-added jobs (e.g., engineering) ▪ New firm creation returns to normal levels, demanding outsourced office functions
Leisure and hospitality	2.0%	2.3% (3.3)	▪ Consumer spending growth returns, household balance sheets improve, and wealth effect encourages spending on leisure and recreation ▪ Additional foreign tourism increases sector demand
Retail	0.8%	0.8% (1.2)	▪ Consumer spending returns to 2007 levels more quickly than anticipated (before 2014) ▪ Productivity growth remains at historic levels
Construction	2.8%	2.8% (1.8)	▪ Residential and commercial construction rebounds; housing starts reach long-term average of 1.5 million by 2014 ▪ Subsidies or legislation ignite clean-tech retrofitting boom ▪ Higher infrastructure investments than in the past
Manufacturing	-2.2%	0% (0)	▪ Some recovery in US exports offsets productivity growth and results in flat employment—a large improvement over the 2000–10 period ▪ Some reversal of offshoring due to rising wages and transportation costs, supply-chain risk, and concerns over intellectual property and customer service

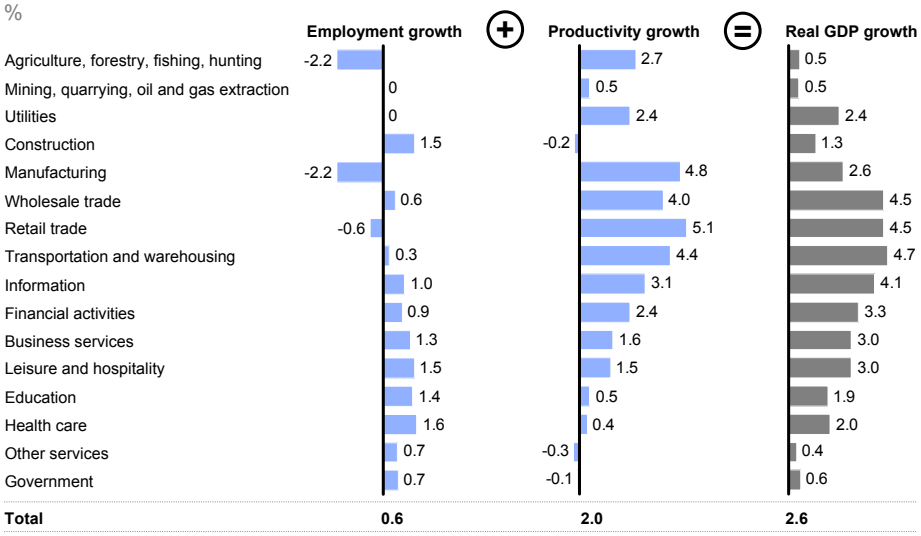
SOURCE: Moody's Analytics; Global Insight; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit A4

Employment growth, productivity growth, and GDP growth by sector: Low scenario

Compound annual growth rate, 2010–2020

%



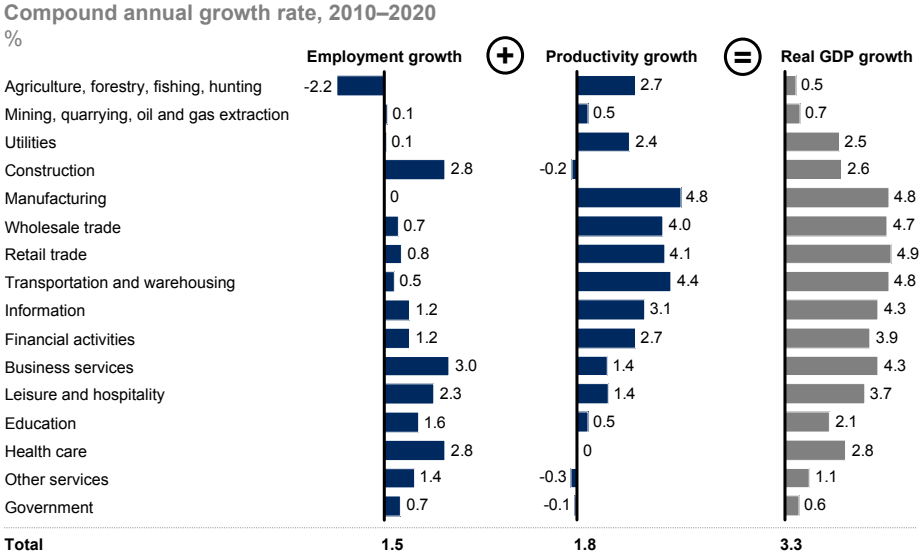
NOTE: Numbers may not sum due to rounding.
SOURCE: Moody's Analytics; McKinsey Global Institute analysis

Exhibit A5

Employment growth, productivity growth, and GDP growth by sector: High scenario

Compound annual growth rate, 2010–2020

%



NOTE: Numbers may not sum due to rounding.
SOURCE: Moody's Analytics; McKinsey Global Institute analysis

3. DETERMINING FUTURE SKILL REQUIREMENTS

Based on the sector employment scenarios already described, we then calculate demand for different occupations and skills. To do this, we use a proprietary framework that groups occupations into production, transaction, and interaction categories. Production occupations involve the conversion of materials into finished products; transaction occupations primarily involve routine exchanges; interaction jobs involve direct contact and independent problem solving. The jobs within each category have varying educational attainment requirements and span different skill levels: a production worker can be preparing food or operating advanced manufacturing machinery, while a transaction job can range from food server to accountant. Interaction jobs have the greatest range, from home health care aides to doctors and lawyers. In the United States today, more than 50 percent of employment falls into either high-skill interaction or moderate- to low-skill transaction (Exhibit A6).

Exhibit A6

2010 employment is concentrated in high-skill interaction work and moderate- to low-skill transaction work

0–5% | 5–10% | >10% | % of total employment

Typical education required	Production (13%)	Transaction (39%)	Interaction (48%)
No high school diploma	▪ Construction assistants ▪ Drywall or tile installers ▪ Food preparation 3	▪ Maids ▪ Grounds maintenance staff ▪ Cashiers 5	▪ Security guards ▪ Day care workers 2
High school diploma	▪ Food prep/service ▪ Construction foremen ▪ Carpenters 6	▪ Stock clerks ▪ Cashiers ▪ Janitors 14	▪ Nursing aides ▪ Child care workers ▪ Telemarketers 9
Some college, no degree	▪ Construction inspectors ▪ Machinists ▪ Restaurant cooks 2	▪ Bookkeeping clerks ▪ Secretaries ▪ Photographers 9	▪ Customer service reps ▪ Medical assistants ▪ Purchasing agents 8
Associate or postsecondary vocational degree	▪ Welders ▪ Semiconductor processors ▪ Jewelers/stone workers 1	▪ Drafters ▪ Radiology technicians ▪ Electrical technicians 4	▪ Dental hygienists ▪ Therapist assistants ▪ Computer support technicians 5
Bachelor's degree or higher	▪ High-tech manufacturing 1	▪ Accountants ▪ Computer programmers ▪ Loan officers 8	▪ Teachers ▪ Engineers ▪ Lawyers 24

NOTE: Numbers may not sum due to rounding.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

To fill out this framework, we translate the sector employment projections from our job scenarios into occupational employment, and then from occupations to the levels of education needed. We use the Bureau of Labor Statistics Employment Projections Program data for 2008 and 2018 to show the evolving occupational mix of each sector. We then apply that occupational mix to our sector employment estimates at the level of three-digit NAICS codes (e.g., food manufacturing as opposed to manufacturing overall).

We then map approximately 750 occupation codes to production, transaction, and interaction categories and to skill levels. To determine the skill requirement mapping, we use the 2008 American Community Survey (ACS) data that provide educational attainment by object class code (OCC)[77] (Exhibit A7).

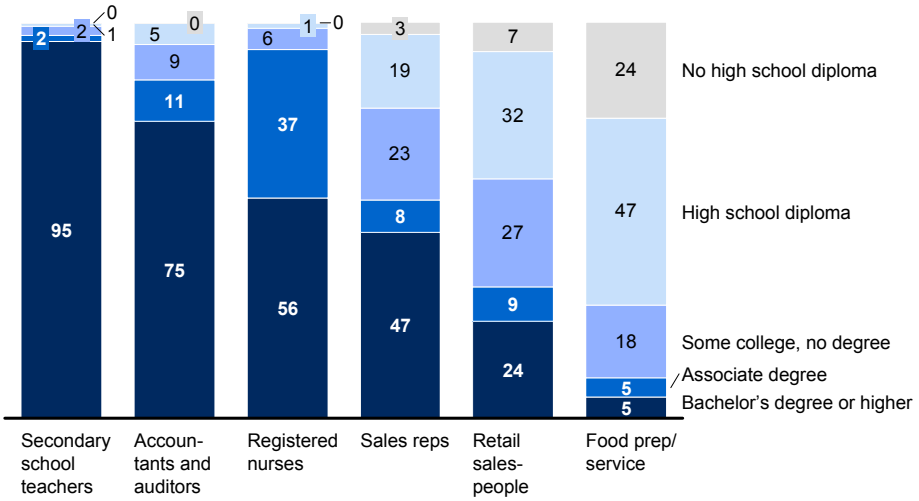
77 Combining the American Community Survey educational attainment data with Bureau of Labor Statistics' Employment Projections Program data on occupation mix slightly understates the skills requirement. This is due to multiple factors, including payroll vs. total employment across surveys, and the propensity of those surveyed in the ACS to refer to themselves as managers, overstating their actual roles. Thus, we adjusted the educational attainment by occupation to tie to March 2010 CPS supplemental data on overall skills of the employed.

Exhibit A7

The American Community Survey provides information on current education levels by occupation

Educational attainment for selected occupations

%



NOTE: Numbers may not sum due to rounding.
SOURCE: US Census Bureau; US Bureau of Labor Statistics; McKinsey Global Institute analysis

However, because educational attainment levels are rising for many of the occupations, it would not be accurate to assume that a given occupation will have the same skill requirements in 2020 as in 2008. Indeed, while the percentage of employed US workers who have a bachelor's degree or higher rose from 29 percent in 2003 to 32 percent in 2008, only one percentage point of this shift can be explained by change in occupation mix; this indicates an increase in educational attainment, or "up-skilling."

To factor this into our projections for skill requirements, we use the projected 2008–2018 up-skilling estimate from Carnevale, et al.[78] Their estimate is based on data from the Current Population Survey going back to the early 1990s that is used to project skill requirements going forward. Carnevale predicts significant up-skilling, particularly in managerial/professional and health care support occupations (Exhibit A8).

We use this estimate of up-skilling, combined with our sector employment changes, to find that approximately 56.6 million jobs will require a bachelor's or higher degree in 2020 in the high-job-growth scenario. At first glance, this would seem similar to our projection of 56.5 million people with such degrees. However, even at full employment, there is a large amount of turnover in the US labor market each year. At any given time, some number of people will be between jobs. To take into account this frictional unemployment, we use the average unemployment rate for 2000–2007 for college graduates in the years prior to the 2008 recession (2.4 percent). Factoring this in, we find that the effective demand for college graduates is 58 million. This results in a shortage of 1.5 million college graduates in 2020. This shortage will be exacerbated by the fact that many of these people will not have the fields of specialization sought by employers, as we note elsewhere in this report.

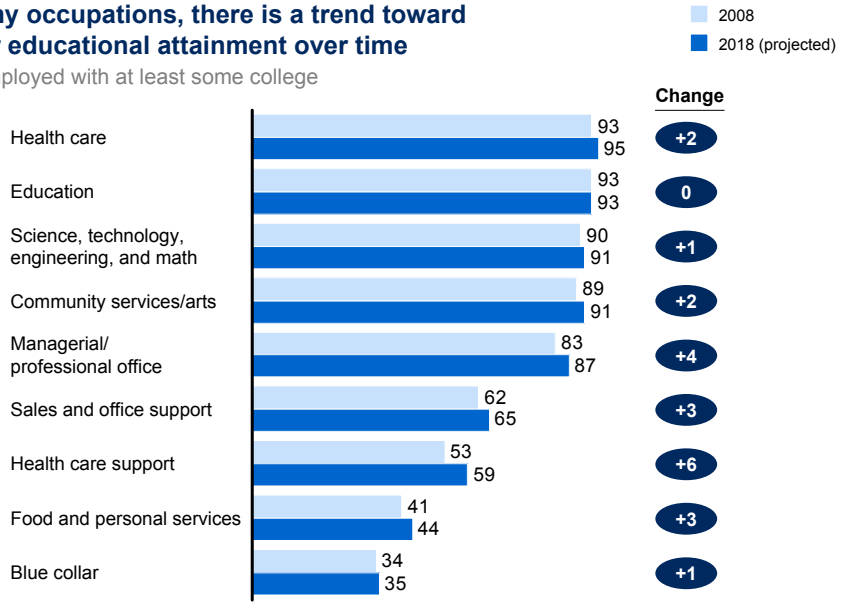
78 See Anthony Carnevale, Nicole Smith, and Jeff Strohl, *Help wanted: Projections of jobs and education requirements through 2018*, Center for Education and the Workforce, Georgetown University, June 2010.

In every scenario, our analysis shows that job growth will be highest for occupations requiring a bachelor's degree or higher. However, job growth for occupations that require a high school diploma or less differs widely across scenarios and is most robust in the high-job-growth scenario (Exhibit A9).

Exhibit A8

In many occupations, there is a trend toward higher educational attainment over time

% of employed with at least some college



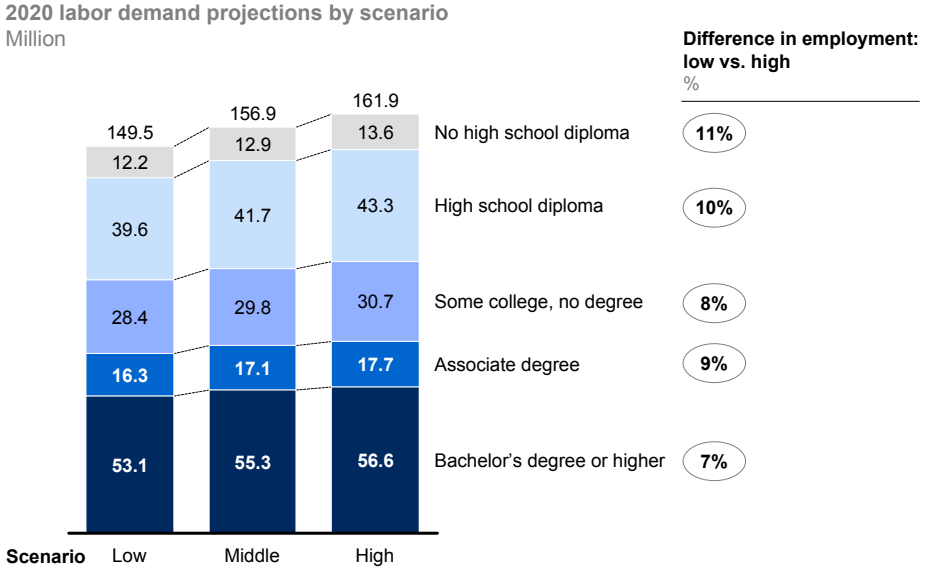
SOURCE: Anthony Carnevale, Nicole Smith, and Jeff Strohl, *Help wanted: Projections of jobs and education requirements through 2018*, 2010; Center for Education and the Workforce, Georgetown University, June 2010; US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit A9

There are fewer jobs for people without postsecondary education in the low-job-growth scenario

2020 labor demand projections by scenario

Million



SOURCE: McKinsey Global Institute analysis

4. PROJECTING LABOR SUPPLY TO 2020

We base our projection of US labor supply to 2020 on four major flows of workers: those leaving the educational system; net immigration; the return of prime working-age, discouraged workers to the labor force; and the exit of retirees. For all of these

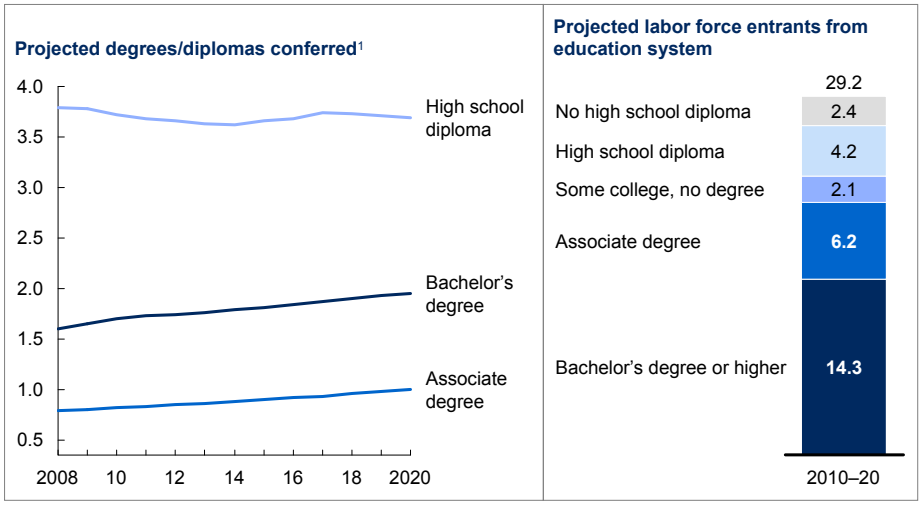
flows, we estimate the total number in the population, their educational attainment, and their labor force participation rates.

New entrants from the US educational system. Based on estimates by the National Center for Education Statistics (NCES), the estimated flow from the educational system will add 29.2 million workers to the labor force by 2020. To understand the educational attainment of these new workers, we start with projections of college degrees and high school diplomas conferred as well as the current number of high school enrollees (Exhibit A10). To translate degrees conferred to labor force participants requires several steps.

Exhibit A10

National Center for Education Statistics projects an increase in new workers with bachelor's and associate degrees

Million



1 2008–19 projections extrapolated to 2020.

SOURCE: National Center for Education Statistics; US Census Bureau; US Bureau of Labor Statistics; McKinsey Global Institute analysis

First, we remove double counting of degrees conferred—that is, some of those who receive bachelor's degrees have already received associate degrees, and all of the people who earn graduate degrees (master's, professional, and doctoral) already received bachelor's degrees. To avoid this double counting, we use a similar method to Carnevale et al. We estimate that 17 percent of bachelor's degree earners already have an associate degree, so we subtract these associate degrees from the total number of associate degrees awarded. Similarly, all of the postgraduate degrees are subtracted from the total number of bachelor's degrees awarded. Timing considerations are also factored in to ensure adjustments to the associates and bachelor's degree totals are made in the correct years. We assume a two-year gap between associate and bachelor's degrees as well as between bachelor's and master's degrees. For example, the number of master's degrees conferred in 2012 was subtracted from the number of bachelor's degrees conferred in 2010. In addition, we factor in a two-year gap between master's and doctoral degrees.

We then determine the likely labor force participation rate associated with each inflow cohort, using the 2008 labor force participation rates of 20- to 24-year-olds with different levels of educational attainment as a proxy. We choose the 2008 time period to model recovery after the recession, and we choose the 20- to 24-year-old age cohort as representative of the majority leaving the educational system.

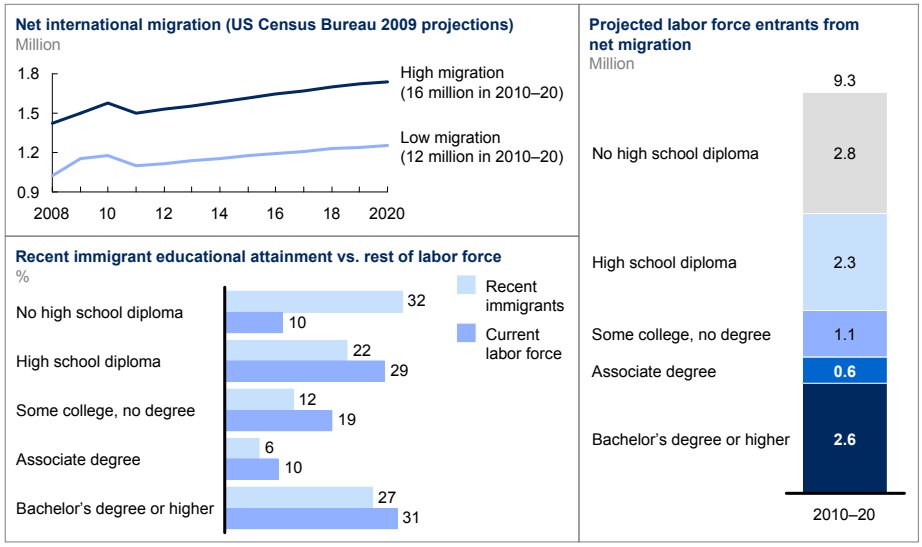
Net immigration. We estimate that immigration will add 9.3 million people to the US labor force by 2020. These are only those immigrants who come to the United States and directly enter the labor force. Immigrants coming to the United States and entering the educational system are already captured in the NCES's projections of degrees conferred. We use the broadest possible definition of net immigration, including authorized and unauthorized immigrants, since both are potential labor force participants.

The calculation of net immigration began by reviewing the estimates from the Congressional Budget Office, the Social Security Administration, and the Census Bureau. We choose the 2009 Census population projections, which are widely used in academic and other literature, and also provide a range of scenarios for low and high net migration.[79] This results in a range of 12 million to 16 million net migrants from 2010 to 2020; we use the midrange of 14 million for our projection.

The educational attainment of recent immigrants is quite polarized, with 32 percent having less than a high school diploma and 27 percent holding a bachelor's degree or higher (Exhibit A11). This mix is based on the Pew Hispanic Center analysis of foreign-born workers.[80] We use March 2010 Current Population Survey data for the foreign-born labor force participation rate by educational attainment. This results in an estimated labor force participation rate of 67 percent for this inflow group, which is slightly higher than the 64.5 percent of the overall population. Most notably, the participation rate for those without high school diplomas is 63 percent among immigrants, which is substantially higher than the participation rate of 46 percent for all US residents aged 16 and older with this level of educational attainment.

Exhibit A11

Immigrants entering the US workforce tend to be either very high-skilled or very low-skilled



NOTE: Numbers may not sum due to rounding.
SOURCE: US Census Bureau; Pew Research Center; US Bureau of Labor Statistics; McKinsey Global Institute analysis

79 From the U.S. Population Projections by the US Census Bureau, *Summary tables for the 2009 National Population Projections (Supplemental).*

80 See Pew Research Center, "Statistical portrait of the foreign-born population in the United States," Pew Hispanic Center, 2009.

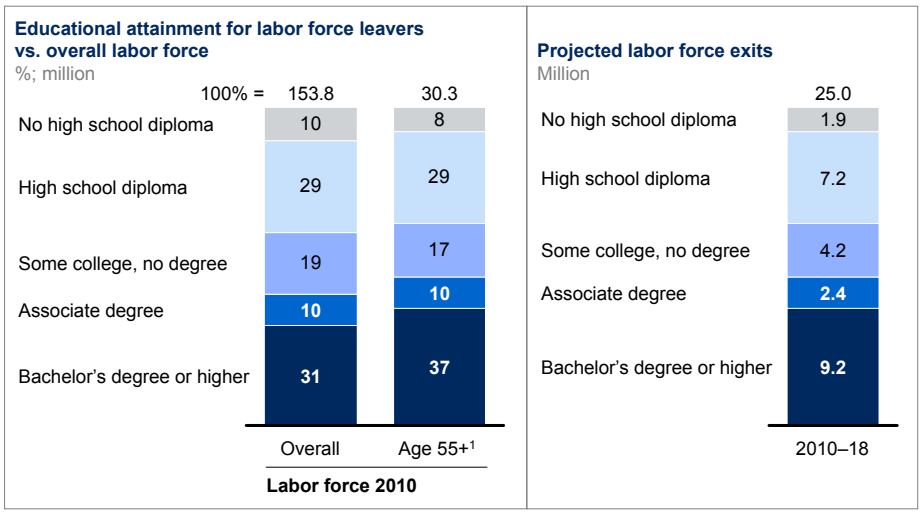
Increased participation among prime-aged workers. The third flow we consider is a return of an estimated 1.5 million prime-age workers (25–54) to the labor force as a recovery occurs. First of all, we choose to look at this prime-age population alone because the other age cohorts (16–24 and 55+) are dealt with in our labor force flows for education and retirement. We do not necessarily assume that all discouraged workers in the economy will return to the labor force. Rather, we believe that a solid baseline scenario is a return to the January 2008 labor force participation rate for these workers to 83.1 percent from 82.0 percent in December 2010, our starting period. For reference, there were an estimated 6.2 million workers of all ages in the nation that wanted a job but were not in the labor force in December 2010 versus 4.4 million in December 2007. In essence, our projection assumes most, but not all, of these workers join the labor force in this decade as the economy picks up.

Labor force exits. The fourth flow considered is the exit of 25 million labor force participants by 2020. This figure, based on Bureau of Labor Statistics projections,[81] includes workers who retire, people who go on long-term disability, and other people who leave the labor force for various reasons (e.g., new mothers). The BLS analysis includes a continuing trend of older workers postponing retirement; the labor force participation rate of workers age 55 and older is projected to increase from 39.5 percent in 2008 to 43.5 percent in 2018. Although the BLS does not provide an explicit explanation for this increase, we believe that this is a reasonable baseline scenario that takes into account the insufficient retirement savings of baby boomers.

The BLS does not provide an estimate of the educational attainment of those leaving the labor force. However, since more than 85 percent of people leaving the labor force are 55 or older, we use the 2010 educational attainment of the age 55 and older population in the labor force. We find that the 55 and older labor force today is better educated than the labor force overall, with 37 percent holding a bachelor's degree or higher (Exhibit A12).

Exhibit A12

People exiting the labor force have slightly higher educational attainment than the overall workforce



1 While overall education of 55+ population is lower than younger cohorts, the 55+ group left in the labor force today is more highly educated.
NOTE: Numbers may not sum due to rounding.
SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

81 From the Bureau of Labor Statistics' Employment Projections Program tables.

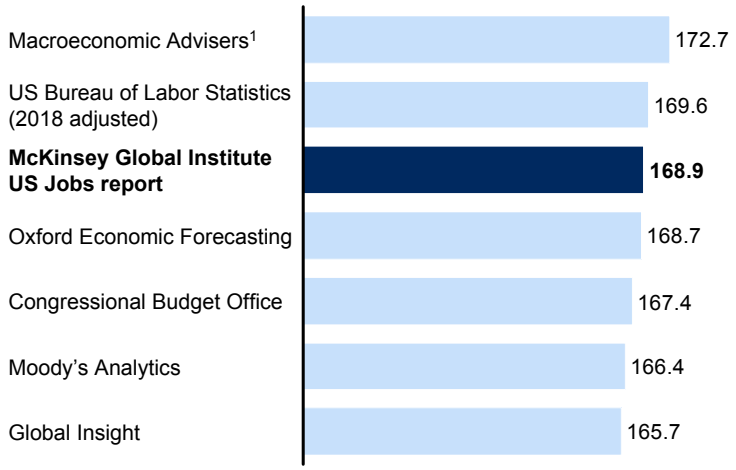
Total labor supply in 2020 grows to 168.9 million. Adding these four flows to our December 2010 baseline of 153.8 million results in 168.9 million labor force participants in 2020.[82] This is within the range of other public and private forecasts (Exhibit A13). It is interesting to note, however, the wide range of estimates for population growth and labor force participation rate in different forecasts.

Exhibit A13

Our labor supply projection for 2020 falls in line with other public and private forecasts

2020 labor force projections

Million



1 Estimated from 1.16% stated 2010–20 compound annual growth rate with a December 2010 baseline of 153.8 million.

SOURCE: National Center for Education Statistics; US Census Bureau; US Bureau of Labor Statistics; Moody's Analytics; Oxford Economic Forecasting; Global Insight; Macroeconomic Advisers; McKinsey Global Institute analysis

Sensitivity of labor supply projections

Our labor supply projections depend on a number of assumptions that may or may not prove to be accurate. To test the sensitivity of our projections to different outcomes, we focus on three factors: a higher or lower immigration rate; no increase in the labor force participation rate of prime working-age, discouraged workers; and a one-year increase in the average retirement age. These scenarios result in estimates of 2020 labor supply that range from 167.3 million to 171.2 million.

Uncertainty in the immigration rate is quite significant. The actual number will be determined by availability of jobs in the United States for immigrants, US immigration policy, and numerous other factors. The skill mix of the projected immigrant inflow could also vary significantly, depending on policy changes. A common policy suggestion has been to increase permanent visa quotas for those with degrees in the STEM fields (science, technology, engineering, and mathematics), which could shift the mix toward those with college degrees.

82 To develop a complete labor force baseline, we used the DataFerrett (Federated Electronic Research, Review, Extraction, and Tabulation Tool) from the US Census Bureau to pull educational attainment including those aged 16–24 for December 2010. While including 16- to 24-year-olds can skew statistics if looking at attainment alone (as many of these people are still in school), we believe it is critical to start with this baseline if we want to develop a true supply-demand comparison in 2020. For instance, 2.4 million 16- to 24-year-olds in the labor force held a bachelor's degree or higher; ignoring these people would imply a bigger supply-demand mismatch than we see in our report.

In our sensitivity analysis, we consider both the high and low net migration series from the US Census Bureau. The high scenario includes an additional 2 million immigrants by 2020. Multiplying this by our estimated immigrant labor force participation rate (67 percent) results in 1.4 million more labor force participants. Similarly, using the low net migration scenario from the Census Bureau would result in 1.4 million fewer immigrants in the 2020 labor force than our baseline (or 2.8 million less than this high scenario).

A second scenario we consider is no return or a lower rate of return of prime-age, discouraged workers to the labor force. This scenario is quite possible; the problems associated with long-term unemployment are well known, and the historically high levels of long-term unemployment could contribute to a smaller labor force in the future. Also, the acceleration of changes in employment mix by sector (e.g., away from manufacturing) could result in a higher number of discouraged workers. To estimate the impact of this scenario, we assume that the labor force participation rate holds stable at the December 2010 level, resulting in 1.5 million fewer workers in the labor force by 2020.

The final scenario we consider is an increase in the average beyond that used in our baseline assumption. To calculate the impact of a further one-year delay in baby boomers' retirement, we used an approach based on labor force participation rates for different five-year age cohorts of workers (e.g., those aged 50–54, 55–59, etc.). We estimated that delaying retirement by 5 years would increase the labor force participation of any cohort to match that of its adjacent younger cohort. Therefore, delaying retirement by one year would increase the participation rate by 20 percent of the difference between that cohort and its adjacent younger cohort. For example, there is a 13 percentage point difference in the labor force participation rate between ages 55–59 and 50–54. Delaying retirement by one year would therefore increase the labor force participation rate of the 55- to 59-year-olds by roughly 2.5 percent (20 percent of 13). With an estimated population of 95 million workers over 55 in 2020, this results in a 2.4 million increase in the labor force.

5. ESTIMATING COLLEGE DEGREE ATTAINMENT

To answer the question of whether the United States is producing the right types of college graduates, we developed a projection of the specific fields of specialization in the labor force by 2020. We conduct this analysis for bachelor's degrees or higher, but not for associate degrees because of limited availability of consistent data on associate degree trends by fields of study. Our main conclusion is that unless we see sharp changes in science, technology, engineering, and mathematics graduation rates (or liberalized immigration policy for applicants with STEM degrees), we will continue to see slow—and insufficient—labor force growth in these fields.

We use the approach of Thompson and Hall at Indiana University's Kelley School of Business and group fields of study into 11 categories (Exhibit A14).[83] For instance, one category is social sciences and services, which includes degrees awarded in social sciences, history, theology, psychology, family sciences, and ethnic studies.

We then estimate the degree mix of the four labor force inflows we project as well as our December 2010 starting baseline for members of those groups. For students entering the labor force through the US educational system, we assume the

83 See Michael F. Thompson and Tanya J. Hall, "Do teachers have education degrees? Matching fields of study to popular occupations of bachelor's degree graduates," *In Context*, Volume 11, Number 1, January–February 2010.

degree mix based on the trends of the past 30 years will continue. As an example, engineering degrees (which includes engineering, technologies, and architecture) were 8.2 percent of degrees conferred from 1970 to 1995; 6.7 percent of degrees conferred from 1995 to 2008; and 6.1 percent of degrees conferred in 2008. Based on this steadily declining trend, we estimate that from 2010 to 2020, 5.5 percent of degrees conferred will be engineering degrees. We replicate this analysis for all labor force flows, using a different degree mix for each one.

Of course, this approach merely represents what would take place if current trends persist. It does not represent potential changes in policy to change this degree mix. However, we believe that this allows us to highlight the challenges associated with maintaining the status quo.

Exhibit A14

We aggregated degree types into 11 standardized categories developed at the Indiana Business Research Center

Categories

- Physical and biological sciences and mathematics
- Social sciences and service
- Business, administration, sales, and marketing
- Nursing and allied health
- Humanities, liberal arts, and fine arts
- Education, except administration
- Computer science and information science
- Engineering, technologies, and architecture
- Communications and journalism
- Office and administrative services
- Other/unknown

SOURCE: Michael F. Thompson and Tanya J. Hall, "Do teachers have education degrees? Matching fields of study to popular occupations of bachelor's degree graduates," *In Context*, January–February 2010; McKinsey Global Institute analysis

Appendix B. Business leader interviews and survey results

In conjunction with the research in this report, we conducted a series of interviews with the chief human resources officers of 17 companies, most of which are Fortune 500 corporations. We also commissioned an employer survey of 2,000 US companies. In this appendix we describe the interviews and survey results in more detail. Our goal in both the interviews and survey was to better understand:

- Outlook for hiring in the United States over the next 3 to 5 years
- How companies responded to the recession
- The potential barriers to future employment growth in the United States
- How the nature of work and skills required in the workforce are evolving
- What policy changes could enhance job creation in the United States

COMPANY INTERVIEWS

To better understand how companies view the challenges and prospects for US employment, we interviewed senior human resource executives from 17 companies. The economic impact of the participating companies is immense: in 2010, they had combined annual sales of more than $700 billion, and they employed nearly 1.5 million workers worldwide. Each company maintains significant operations in the United States, and they span a range of industries including health care, manufacturing, financial services, media, leisure and hospitality, business services, and consumer goods.

We interviewed executives at these companies on the condition that we would not identify them or their companies in the report. Their insights, cited anonymously, are used throughout the text. All references to specific companies in the report come from public sources.

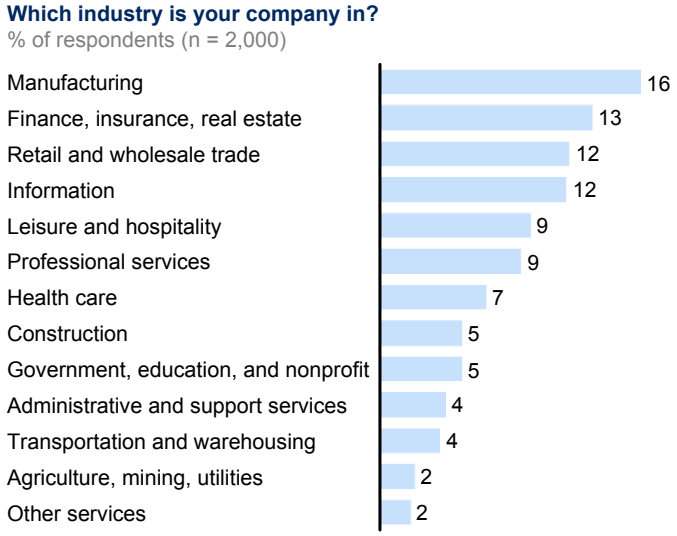
BUSINESS SURVEY

Our survey was conducted in March 2011 and included 2,000 respondents, 90 percent of whom were responsible for hiring in their companies. More than two-thirds of respondents were in human resources–related positions, and 85 percent were C-level executives or partners, directors, general managers, or supervisors.

Our sample represents a broad mix of industries, with the highest share in manufacturing, finance, retail, and information (Exhibit B1). The sample also includes a range of firm sizes: roughly one-third are companies with fewer than 100 employees, and another one-third are companies with 100 to 1,000 employees (Exhibit B2).

Exhibit B1

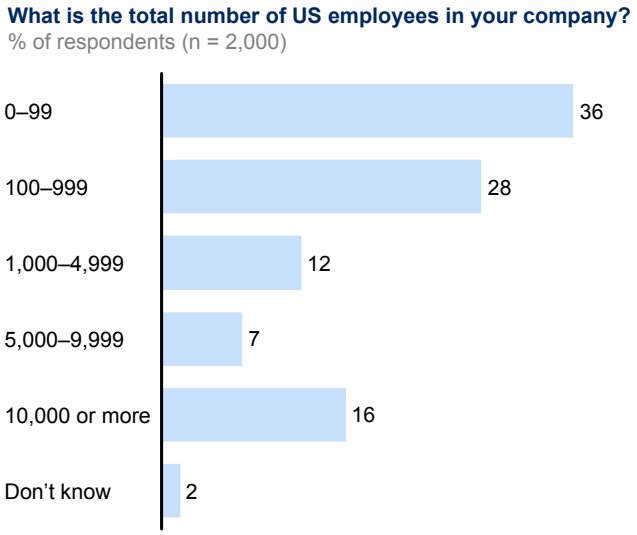
The survey respondents represent a broad mix of sectors



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

Exhibit B2

The sample includes firms of different sizes



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

This sample provides a good view on US employment dynamics; 26 percent said their companies reduced staffing in the preceding 12 months, and 51 percent said they expect employment to grow over the next 12 months. Here we summarize the main survey findings.

65 percent of companies made operational changes to increase labor productivity over the past three years

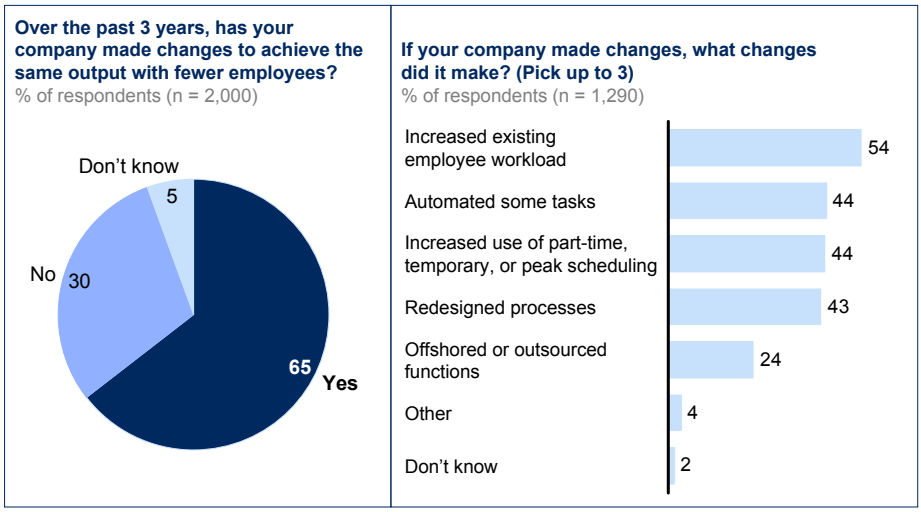
As noted in Chapter 1, 65 percent of businesses in the sample have restructured operations to reduce head count and to increase output per worker in the past three years (Exhibit B3). This was more prevalent among large companies

(76 percent) than small ones (58 percent) and supports our finding that one of the reasons for jobless recoveries is the extent to which companies respond to economic downturns by reducing employment. Some capacity reduction may be temporary, however: 54 percent of respondents indicated that they have already increased the hours of remaining employees to make up for fewer workers, which suggests that they will have to refill positions when demand picks up. But some changes that reduce the need for labor are likely to be permanent: 44 percent of companies automated some tasks; 43 percent redesigned processes; and 44 percent used peak scheduling or part-time or temporary workers.

Interestingly, only 24 percent of respondents whose companies took steps to improve productivity over the past three years said they had used outsourcing or offshoring. Large firms were more likely to offshore or outsource than small firms (33 percent versus 18 percent). This is consistent with our finding that the economics of offshoring may be changing.

Exhibit B3

65 percent of companies have restructured operations in the past 3 years



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

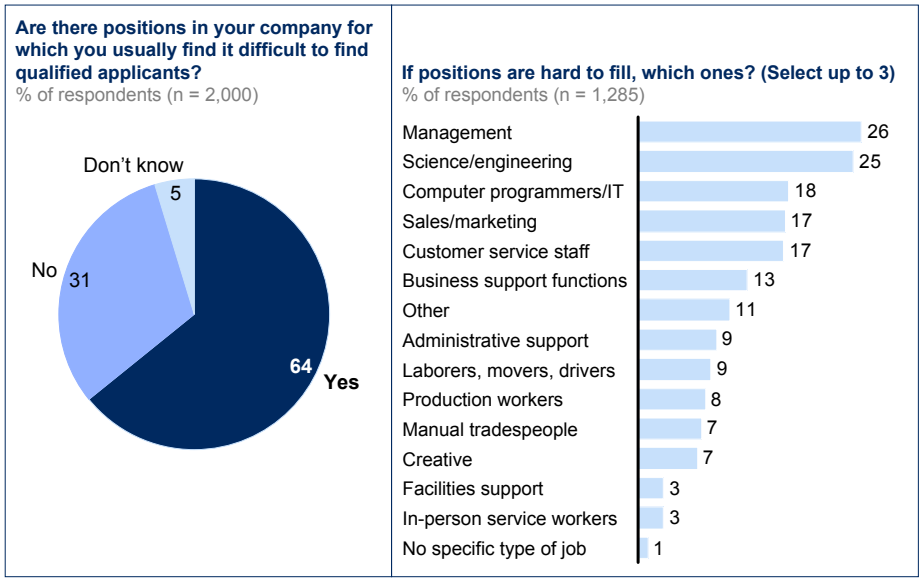
Two-thirds of companies report difficulty filling some positions—and 30 percent have had positions open for six months or longer

Nearly two-thirds of all companies report difficulty in filling some types of positions. In the health care and manufacturing sectors, 43 percent of firms had open positions for six months or longer; 30 percent of all firms did. The mismatch of workers to jobs may constrain future job growth: 41 percent of companies planning to hire more workers in the next 12 months have had open positions for six months or more.

Management and science/engineering positions are the hardest to fill: more than a quarter of respondents cited difficulty in filling these positions. Manufacturing firms find it particularly hard to fill science and engineering positions: 46 percent of manufacturing firms reported difficulty hiring engineers, compared with 25 percent of all firms. Computer programmers and other IT jobs, cited by 18 percent of respondents, are the third most difficult position to fill (Exhibit B4).

Exhibit B4

Management and science/engineering positions are the hardest to fill



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

When asked to explain why they had difficulty filling certain jobs, most employers said there was not a lack of applicants for any of their openings, but too few applicants with the right qualifications. Employers are looking for people with proven skills in the right fields; the number one cause for difficulty in filling positions (cited by 45 percent of companies) is lack of sufficient experience (Exhibit B5). Other reasons commonly cited are that candidates' wage expectations are too high (35 percent) and that applicants' basic work habits—their mind-sets, attitudes, character traits—are unsuitable (33 percent). Only a few respondents (13 percent) said they would be willing to hire strong performers from different fields.

Exhibit B5

45 percent of companies report that applicants have insufficient job experience

SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

Most companies provide the same training or more than they did five years ago

It is has been widely reported that employers today provide less training than they did in the past. However, our survey results do not support this claim. Across all industries and company sizes, 49 percent of companies said they provided more formal training to midlevel and lower-skill workers than they did years ago. An additional 33 percent said they provided the same amount of training. Companies that had implemented new technology were more likely (60 percent) to have increased training. Also, 61 percent of companies with open positions reported that they were providing more training.

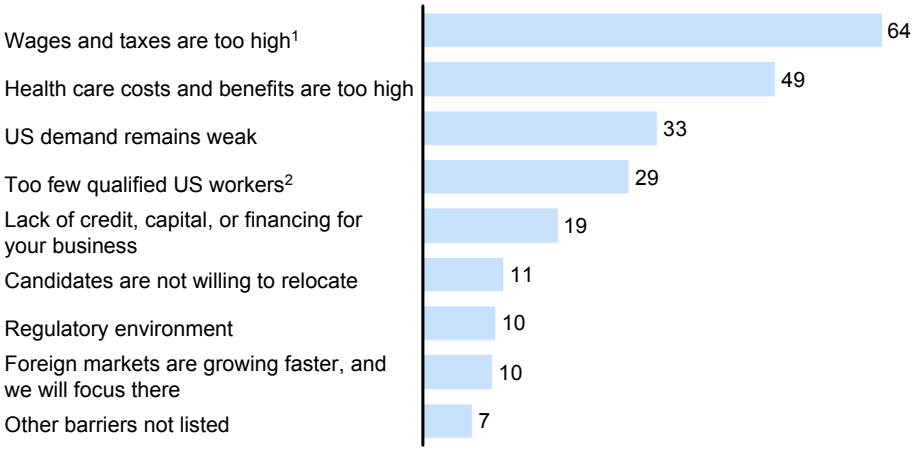
Employers most frequently cite labor costs as the greatest barrier to employment growth

We asked employers to indicate which obstacles to job growth in the United States over the next 5 years will be most critical (Exhibit B6). The most important factors by far: wages and payroll taxes, which were cited by 64 percent of respondents, followed by health care costs (49 percent), low aggregate demand (33 percent), and lack of skills (29 percent). Health care costs are of particular concern to smaller firms (53 percent) compared with large firms (41 percent).

Exhibit B6

Labor costs are biggest barrier to hiring

What are barriers to your company creating US jobs in the next 5 years? (Select up to 3)
% of respondents (n = 2,000)

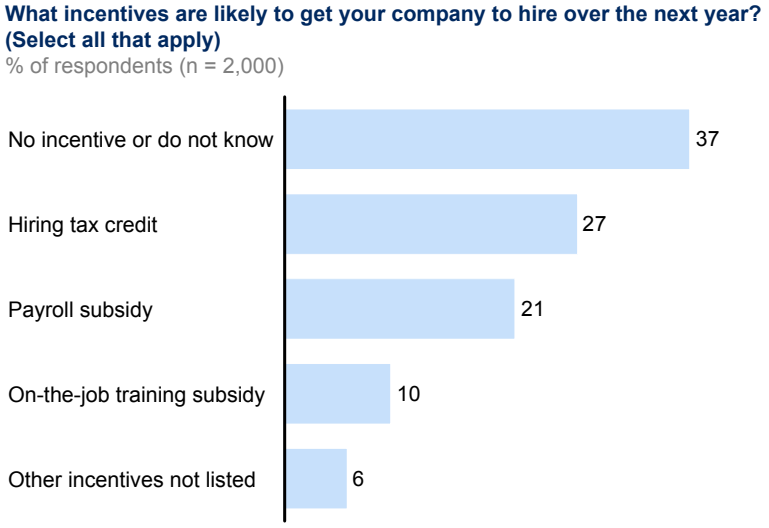


1 Includes wage expectations, payroll taxes, and risk of increased future taxes being too high, as well as other countries providing needed skills at a lower cost.
2 Includes education, experience, technical skills, nontechnical skills, and worker's mind-set, personality, or work ethic.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

Among our respondents, there is not a strong interest in government incentives to boost hiring. A total of 27 percent reported that a hiring tax credit might help persuade their companies to hire in the United States over the next year. An additional 37 percent said that they either didn't know of any incentives or that no incentive would change their companies' hiring plans (Exhibit B7). This is consistent with our interviews, which revealed that the critical factor in hiring decisions is the overall business environment.

Exhibit B7

Incentive schemes are unlikely to have a major impact on hiring



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

Employers foresee strongest employment growth for the most highly skilled workers

The outlook for employment in our survey is quite positive. Slightly more than half of employers, both large and small, report they will increase the size of their workforce in the next 12 months. Only around 10 percent of respondents believe that their workforce may decrease in size.

In terms of what types of workers they plan to hire, the trend clearly confirms that there will be more opportunity for high-skill workers: 53 percent of employers in our survey see the number of workers with a bachelor's degree or higher education increasing, versus only 23 percent of employers who expect their number of workers with only high school diplomas to grow (Exhibit B8). This aligns well with our estimate of increasing educational attainment within occupations discussed in Chapter 3, and it implies a continuation of historical trends.

Employers predict more use of part-time, contingent, and remote workers to gain flexibility

Our survey also confirms the changing nature of work that we discussed in Chapter 4. In our sample, 37 percent of respondents expect to use more part-time workers, and 34 percent expect an increase in temporary or contract workers (Exhibit B9).[84] This is true across all firm sizes. Plans for part-time hiring are especially common in leisure and hospitality, wholesale trade, and retail trade; 57 percent of companies in these sectors expect an increase in part-time hiring. We also found that 26 percent of all companies expect to employ people working from home, and 20 percent expect to have more workers over the age of 55.

84 Because respondents can choose more than one answer, these figures cannot be added. As we note in Chapter 4, 58 percent of respondents plan to increase either part-time or temporary/contract workers.

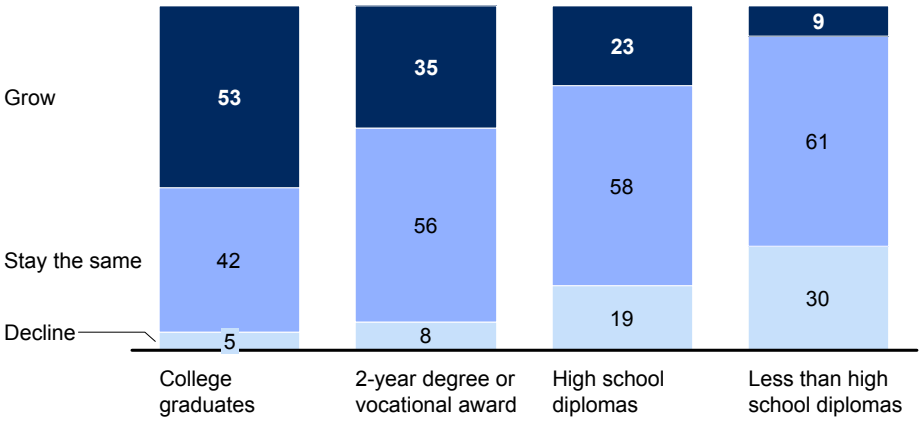
Even as they look for greater workforce flexibility, however, our sample companies do not seem particularly eager to outsource more work. Only 16 percent expect more outsourcing over the next five years, and only 10 percent expect more offshoring of functions or positions.

Overall, the trends are clear: employers want workers with higher skills but will also continue pushing for flexible labor, potentially enabled by technology that supports telecommuting.

Exhibit B8

Respondents see the most job growth among college-educated workers[1]

How will your company's workforce change over the next 5 years? (Select all that apply)
% of respondents (n = 2,000)

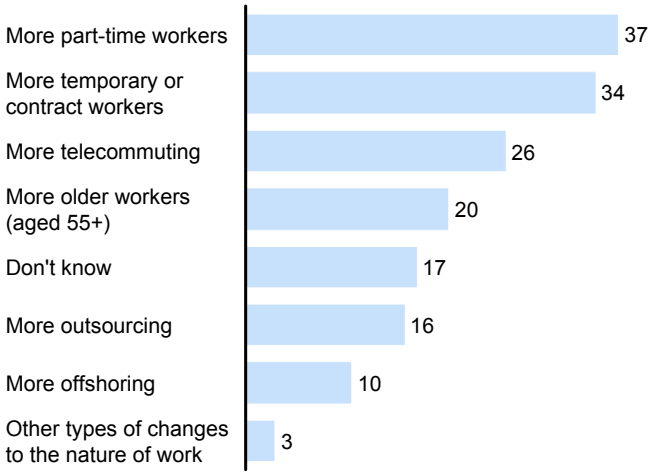


1 Does not include respondents who answered "do not know" for college graduates (9.7%), two-year degrees (12.5%), high school diplomas (12.4%), and less than high school (21.2%).
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

Exhibit B9

Employers foresee a more flexible future labor force

How will your company's workforce change over the next 5 years? (Select all that apply)
% of respondents (n = 2,000)



SOURCE: McKinsey Global Institute US Jobs Survey, 2011; McKinsey Global Institute analysis

Bibliography

ACT, Incorporated, *Breaking new ground: Building a national workforce skills credentialing system*, 2011.

Agrawal, Vivek and Diana Farrell, "Who wins in offshoring," *McKinsey Quarterly*, December 2003.

Ashenfelter, Orley and David Card, eds., *Handbooks in economics: Labor economics*, Volume 4A (Amsterdam: Elsevier, 2011).

Autor, David H., *The polarization of job opportunities in the U.S. labor market*, Center for American Progress (The Hamilton Project), April 2010.

Autor, David H., Frank Levy, and Richard J. Murnane, "The skill content of recent technological change: An empirical exploration," *The Quarterly Journal of Economics*, Volume 118, Number 4, November 2003.

Baily, Martin Neil and Robert Z. Lawrence, "Don't blame trade for US job losses," *McKinsey Quarterly*, February 2005.

Baily, Martin Neil and Robert Z. Lawrence, "What happened to the great US job machine? The role of trade and electronic offshoring," *Brookings Papers on Economic Activity*, Number 2, 2004.

Barsh, Joanna and Lareina Yee, *Unlocking the full potential of women in the US economy*, McKinsey & Company, April 2011.

Bartelsman, Eric, John Haltiwanger, and Stefano Scarpetta, *Microeconomic evidence of creative destruction in industrial and developing countries*, October 2004.

Bartik, Timothy J., *Bringing jobs to people: How federal policy can target job creation for economically distressed areas*, The Hamilton Project discussion paper, Brookings Institution, October 2010.

Bartsch, Kristina J., "The employment projections for 2008–18," *Monthly Labor Review*, Volume 132, Number 11, November 2009.

Biggs, Andrew G., *Statement before the United States House of Representatives Committee on Ways and Means hearing on impediments to job creation*, American Enterprise Institute for Public Policy Research, March 30, 2011.

Booz Allen Hamilton, *Green jobs study*, U.S. Green Building Council, November 12, 2009.

Boushey, Heather, *Improving efforts to help unemployed Americans find jobs*, Center for American Progress Action Fund, February 10, 2011.

Bronfebrenner, Kate and Stephanie Luce, *The changing nature of corporate global restructuring: The impact of production shifts on jobs in the US, China, and around the globe*, U.S. China Economic and Security Review Commission research paper, October 14, 2004.

Brynjolfsson, Erik and Adam Saunders, *Wired for innovation: How information technology is reshaping the economy* (Cambridge, MA: The MIT Press, 2010).

Burda, Michael C. and Jennifer Hunt, *What explains the German labor market miracle in the Great Recession?* McGill University working paper, February 2011.

Burgard, Sarah A., Jennie E. Brand, and James S. House, "Perceived job insecurity and worker health in the United States," *Social Science and Medicine*, Volume 69, Number 5, 2009.

Byun, Kathryn J., "The U.S. housing bubble and bust: Impacts on employment," *Monthly Labor Review*, December 2010.

Caplan, Jeremy, "Phonesourcing: Bringing call centers back to the U.S.," *Time*, April 5, 2010.

Cappelli, Peter and Bill Novelli, *Managing the older worker: How to prepare for the new organizational order* (Boston: Harvard Business Press, 2010).

Card, David, Jochen Kluve, and Andrea Weber, *Active labor market policy evaluations: A meta-analysis*, National Bureau of Economic Research working paper, 16173, July 2010.

Carnevale, Anthony, Nicole Smith, and Jeff Strohl, *Help wanted: Projections of jobs and education requirements through 2018*, Center on Education and the Workforce, Georgetown University, June 2010.

Carnevale, Anthony P., Jeff Strohl, and Michelle Melton, *What's it worth? The economic value of college majors*, Center on Education and the Workforce, Georgetown University, May 2010.

Catalyst, *Targeting inequity: The gender gap in U.S. corporate leadership*, September 28, 2010.

Centers for Medicare and Medicaid Services, *National health expenditure projections 2009–2019*, US Department of Health and Human Services, September 2010.

Congressional Budget Office, *CBO's labor force projections through 2021*, Congress of the United States, March 2001.

Congressional Budget Office, *Changes in the distribution of workers' hourly wages between 1979 and 2009*, Congress of the United States, February 2011.

Congressional Budget Office, *The role of immigrants in the U.S. labor market: An update*, Congress of the United States, July 2010.

Cota, Adam, Kartik Jayaram, and Martha C. A. Laboissière, "Boosting productivity in US higher education," *McKinsey Quarterly*, April 2011.

Daly, Mary, Bart Hobijn, and Rob Valletta, *The recent evolution of the natural rate of unemployment*, Federal Reserve Bank of San Francisco, working paper, 2011–05, January 2011.

Davis, Steven J., John C. Haltiwanger, and Scott Schuh, *Job creation and destruction* (Cambridge, MA: The MIT Press, 1996).

Directorate-General for Economic and Financial Affairs of the European Commission, "2009 ageing report: Economic and budgetary projections for the EU-27 member states (2008–2060)," *European Economy*, Volume 2, 2009.

Dorgan, Stephen J., John J. Dowdy, and Thomas M. Rippin, "The link between management and productivity," *McKinsey Quarterly*, February 2006.

Ehrenberg, Ronald G. and Robert S. Smith, *Modern labor economics: Theory and public policy*, tenth edition (Boston: Pearson/Addison Wesley, 2009).

Estevão, Marcello and Evridiki Tsounta, *Has the Great Recession raised U.S. structural unemployment?* International Monetary Fund working paper ,11/105, February 2011.

Executive Office of the President, *A framework for revitalizing American manufacturing*, National Economic Council, Office of Science and Technology Policy, December 2009.

Executive Office of the President, *A strategy for American innovation: Driving towards sustainable growth and quality jobs*, National Economic Council, Office of Science and Technology Policy, September 2009.

Farber, Henry S., "Mobility and stability: The dynamics of job change in labor markets," in Ashenfelter, Orley and David Card, eds., *Handbooks in economics: Handbook of labor economics*, Volume 3B (Amsterdam: Elsevier, 1999).

Farrell, Diana and Jaana K. Remes, "How the world should invest in energy efficiency," *McKinsey Quarterly*, July 2008.

Field, Simon, Kathrin Hoeckel, Viktória Kis, and Małgorzata Kuczera, *Learning for jobs: OECD reviews of vocational education and training*, Organisation for Economic Co-operation and Development, initial report, 2009.

Freeman, Richard, *The great doubling: The challenge of the new global labor market*, Department of Economics, University of California, Berkeley, August 2006.

Global Insight, *Current and potential green jobs in the U.S. economy*, The United States Conference of Mayors, October 2008.

Goldin, Claudia and Lawrence F. Katz, "Long-run changes in the wage structure: Narrowing, widening, polarizing," *Brookings Papers on Economic Activity*, Volume 38, Issue 2, 2007.

Goldin, Claudia and Lawrence F. Katz, *The race between education and technology* (Cambridge, MA: Belknap Press, 2008).

Gordon, Robert J., *The demise of Okun's law and of procyclical fluctuations in conventional and unconventional measures of productivity*, paper delivered at NBER summer institute, Cambridge, MA, July 21, 2010.

Gordon, Robert J., "Okun's law and productivity innovations," *American Economic Review*, Volume 100, Number 2, May 2010.

Groshen, Erica L. and Simon Potter, "Has structural change contributed to a jobless recovery?" *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, Volume 9, Number 8, August 2003.

Grove, Andy, "How America can create jobs," *Bloomberg Businessweek*, July 1, 2010.

Hackos, Bill and Charles Dowdell, "Baumol's disease: Is there a cure?" *Best Practices*, Center for Information-Development Management, August 2006.

Hall, Robert E., "Job loss, job finding, and unemployment in the U.S. economy over the past 50 years," in Gertler, Mark and Kenneth Rogoff, eds., *NBER Macroeconomics Annual 2005*, Volume 20 (Cambridge, MA: MIT Press, April 2006).

Haltiwanger, John C., Ron S. Jarmin, and Javier Miranda, *Who creates jobs? Small vs. large vs. young*, National Bureau of Economic Research working paper, 16300, August 2010.

Hansen, Bruce E., "The new econometrics of structural change: Dating breaks in U.S. labor productivity," *Journal of Economic Perspectives*, Volume 15, Number 4, Fall 2001.

Harrington, Paul E. and Andrew M. Sum, "College labor shortages in 2018?" *The New England Journal of Higher Education*, November 2010.

Hersh, Adam and Christian E. Weller, *Measuring future U.S. competitiveness: U.S. productivity and innovation snapshot*, Center for American Progress, February 9, 2011.

Hewlett, Sylvia, Kerrie Peraino, Laura Sherbin, and Karen Sumberg, *The sponsor effect: Breaking through the last glass ceiling*, Center for Work-Life Policy, 2011.

Jacobson, Louis S., Robert J. LaLonde, and Daniel G. Sullivan, *The costs of worker dislocation* (Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, 1993).

Johnson, Bradford C., James M. Manyika, and Lareina A. Yee, "The next revolution in interactions," *McKinsey Quarterly*, November 2005.

Kahn, Lisa, *The long-term labor market consequences of graduating from college in a bad economy*, Yale School of Management, August 2009.

Katz, Lawrence, *Long-term unemployment in the Great Recession*, testimony before the Joint Economic Committee, US Congress, April 29, 2010.

Kletzer, Lori G., *Job loss from imports: Measuring the costs*, Peterson Institute for International Economics, 2001.

Kling, Jeffrey R., *Fundamental restructuring of unemployment insurance: Wage-loss insurance and temporary earnings replacement accounts*, Brookings Institution, September 2006.

Kohn, Donald, *Promoting economic recovery and job creation: The road forward*, testimony before the Committee on Financial Services, US Congress, January 26, 2011.

Levy, Frank, *How technology changes demands for human skills*, OECD working paper, 45, OECD Publishing, March 5, 2010.

Locke, Gary, *Remarks before the Middle Class Task Force Meeting: Manufacturing*, Washington, DC, December 16, 2009.

Long, Bridget, *Grading higher education: Giving consumers the information they need*, Harvard Graduate School of Education, December 2010.

Macroeconomic Advisers LLC, "Good news: U.S. labor force growth through 2020 could be faster than widely expected," *Macro Focus*, Volume 6, Number 5, April 26, 2011.

Malone, Thomas W., *The future of work: How the new order of business will shape your organization, your management style, and your life* (Cambridge, MA: Harvard Business Press, 2004).

Mankiw, N. Gregory, *Principles of macroeconomics*, third edition (New York: Worth Publishers, 1997).

Manpower Group, Manpower talent shortage survey, 2006–2011.

McAfee, Andrew, *Enterprise 2.0: New collaborative tools for your organization's toughest challenges* (Cambridge, MA: Harvard Business School Press, 2009).

McConnell, Margaret M., and Joseph S. Tracy, *Unemployment insurance and the diminished importance of temporary layoffs over the business cycle*, Federal Reserve Bank of New York, May 2005.

McKinsey & Company, *The economic impact of the achievement gap in America's schools*, April 2009.

McKinsey & Company, *Winning by degrees: The strategies of highly productive higher-education institutions*, November 2010.

McKinsey Global Institute, *Accounting for the cost of US health care: A new look at why Americans spend more*, December 2008.

McKinsey Global Institute, *Beyond austerity: A path to economic growth and renewal in Europe*, October 2010.

McKinsey Global Institute, *Big data: The next frontier for innovation, competition, and productivity*, May 2011.

McKinsey Global Institute, *Changing the fortunes of America's workforce: A human capital challenge*, June 2009.

McKinsey Global Institute, *Growth and competitiveness in the United States: The role of its multinational companies*, June 2010.

McKinsey Global Institute, *Growth and renewal in the United States: Retooling America's economic engine*, February 2011.

McKinsey Global Institute, *How to compete and grow: A sector guide to policy*, March 2010.

McKinsey Global Institute, *Talkin' 'bout my generation: The economic impact of aging US baby boomers*, June 2008.

McKinsey Global Institute, *Will US consumer debt reduction cripple the recovery?* March 2009.

Mussa, Michael, *Global economic prospects as of September 30, 2010: A moderating pace of global recovery*, Peterson Institute for International Economics, September 2010.

Oi, Walter Y., "Labor as a quasi-fixed factor," *The Journal of Political Economy*, Volume 70, Number 6, December 1962.

Oi, Walter Y. and Todd L. Idson, "Firm size and wages," in Ashenfelter, Orley, and David Card, eds., *Handbooks in economics: Handbook of labor economics*, Volume 3B (Amsterdam: Elsevier, 1999).

Okun, Arthur M., *Potential GNP: Its measurement and significance*, 1962 Proceedings of the Business and Economic Statistics Section of the American Statistical Association.

Peck, Don, "Early career moves are the most important," *National Journal*, May 8, 2010.

Peck, Don, "How a new jobless era will transform America," *The Atlantic*, March 2010.

Pew Research Center, "Statistical portrait of the foreign-born population in the United States," Pew Hispanic Center, 2009.

Phelps, Edmund S., *Supporting innovation: Why and how*, speech at Camera dei Deputati, Italy, February 2, 2011.

Phelps, Edmund S. and Leo Tilman, "Wanted: A First National Bank of Innovation," *Harvard Business Review*, January–February 2010.

Pisano, Gary P. and Willy C. Shih, "Restoring American competitiveness," *Harvard Business Review*, July–August 2009.

Ready Indiana, *Annual employer workforce skills survey*, 2010.

Reinhart, Carmen M., and Kenneth S. Rogoff, *This time is different: Eight centuries of financial folly* (Princeton and Oxford: Princeton University Press, 2009).

Roland-Holst, David, *Energy efficiency, innovation, and job creation in California*, Center for Energy, Resources, and Economic Sustainability (CERES), University of California, Berkeley, October 2008.

Seoul G20 Business Summit, *Preliminary findings and recommendations from participants: Discussion report for round table discussions*, September 2010.

Soares, Rachel, Jan Combopiano, Allyson Regis, Yelena Shur, and Rosita Wong, *2010 Catalyst Census: Fortune 500 women executive officers and top earners*, Catalyst, 2010.

Sparks, Erin and Mary Jo Waits, *Degrees for what jobs? Raising expectations for universities and colleges in a global economy*, National Governors Association Center for Best Practices, March 2011.

Spence, Michael and Sandile Hlatshwayo, *The evolving structure of the American economy and the employment challenge*, Council on Foreign Relations working paper, March 2011.

Stangler, Dane and Robert E. Litan, *Where will the jobs come from?* Ewing Marion Kauffman Foundation, November 2009.

Sullivan, Daniel and Till von Wachter, "Job displacement and mortality: An analysis using administrative data," *The Quarterly Journal of Economics*, Volume 124, Number 3, 2009.

Sum, Andrew, Ishwar Khatiwada, and Joseph McLaughlin, *The economic recession of 2007–2009: A comparative perspective on its duration and the severity of its labor market impacts*, Center for Labor Market Studies, Northeastern University, April 2009.

Sum, Andrew and Joseph McLaughlin, *How the U.S. economic output recession of 2007-2009 led to the Great Recession in labor markets: The role of corporate job downsizing, work hour reductions, labor productivity gains, and rising corporate profits*, Center for Labor Market Studies, Northeastern University, July 2010.

Symonds, William C., Robert B. Schwartz, and Ronald Ferguson, *Pathways to prosperity: Meeting the challenge of preparing young Americans for the 21st century*, Pathways to Prosperity Project, Harvard Graduate School of Education, February 2011.

Thompson, Michael F. and Tanya J. Hall, "Do teachers have education degrees? Matching fields of study to popular occupations of bachelor's degree graduates," *In Context*, Volume 11, Number 1, January–February 2010.

Turner, Adair, *Just capital: The liberal economy* (London: Pan Macmillan, 2001).

US Census Bureau, *Methodology statement for the 2009 national projections*, August 14, 2008.

US Travel Association and Oxford Economics, *The lost decade: The high costs of America's failure to compete for international travel*, February 2010.

Valletta, Rob and Katherine Kuang, "Extended unemployment and UI benefits," *Federal Reserve Bank of San Francisco Economic Letter 2010–12*, April 19, 2010.

Valletta, Rob and Katherine Kuang, "Is structural unemployment on the rise?" *Federal Reserve Bank of San Francisco Economic Letter 2010–34*, November 8, 2010.

Von Wachter, Till, *Challenges for the US economic recovery*, testimony before the US Senate Budget Committee, February 2, 2011.

Von Wachter, Till, Jae Song, and Joyce Manchester, *Long-term earnings losses due to mass layoffs during the 1982 recession*, Columbia University, Department of Economics discussion paper, 0708-16, 2009.

Weidner, Justin and John C. Williams, "What is the new normal unemployment rate?" *Federal Reserve Bank of San Francisco Economic Letter 2011–05*, February 14, 2011.

WorldatWork and The Dieringer Research Group*, Telework trendlines 2009*.

World Bank and International Finance Corporation, *Doing business 2011: Making a difference for entrepreneurs* (Washington, DC: World Bank, 2010).

Zandi, Mark M., and Zoltan Pozsar, *U.S. macro model system*, Moody's Analytics, 2010.

Relevant McKinsey Global Institute publications

Growth and renewal in the United States: Retooling America's economic engine (February 2011)

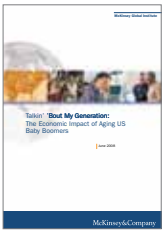
In order to drive growth and competitiveness, the United States needs to boost labor productivity growth to a rate not seen since the 1960s. It is important that the United States returns to the more broadly based productivity growth of the 1990s when strong demand and a shift to products with a higher value per unit helped to create jobs even as productivity was growing.

Growth and competitiveness in the United States: The role of its multinational companies (June 2010)

Although US multinationals include many of the biggest companies in the United States, the full extent of their economic impacts is less well known. MGI seeks to provide a fuller picture by assessing the contributions of MNCs across the key metrics of economic performance.

Changing the fortunes of America's workforce: A human capital challenge (June 2009)

Rising income dispersion in the United States and other advanced nations has become a source of concern. Since the early 1970s, incomes for the highest US earners have raced ahead, while those at the bottom of the income distribution have stood still and those in the middle barely increased. This report examines changes in income dispersion and their causes from 1991 to 2005.



Talkin' 'bout my generation: The economic impact of aging US baby boomers (June 2008)

Despite their aggregate wealth, a vast majority of US baby boomers are unprepared for retirement. Enabling them to work longer would significantly benefit both individuals and the broader economy, but policy makers and business leaders will need to take action.

Accounting for the costs of US health care: A new look at why Americans spend more (December 2008)

The United States spends $650 billion more on health care than expected, even when adjusting for the economy's relative wealth; MGI examines the underlying trends and key drivers of these higher costs. The study finds that outpatient care, which includes same-day hospital and physician office visits, is by far the largest and fastest-growing part of the US health system.

The emerging global labor market (June 2005)

Although the practice of offshoring is growing among companies in developed countries, a wide gap exists between the number of service jobs that could be located remotely and the number of jobs that have been offshored. This white paper examines the potential for offshoring in a variety of industries.

www.mckinsey.com/mgi

eBook versions of selected MGI reports are available on MGI's website, on Amazon's Kindle bookstore, and on Apple's iBookstore.

Download and listen to MGI podcasts on iTunes or at www.mckinsey.com/mgi/publications/multimedia/

McKinsey Global Institute
June 2011
Copyright © McKinsey & Company
www.mckinsey.com/mgi