



C H A P T E R 4

JOBS, WORKERS AND SKILLS

The future of the American economy depends critically on our workers and their skills, especially in today’s global economy. For the past three decades, American workers have faced a challenging job market. Computers and robots now perform routine tasks, reducing demand for workers in many industries and occupations. In addition, advances in communication technology and low transportation costs have enabled many production jobs to be performed in lower-wage countries abroad. The United States needs to invest in the skills of its workforce to engage effectively in the global competition for good jobs, especially in high-end manufacturing. The Nation also needs to produce and attract highly skilled workers who lead innovation, entrepreneurship, and growth.

Aside from the “skills” challenge, the United States, like many other advanced economies, also faces a “demographic” challenge. Rising longevity and lower birth rates have increased the average age of the population and reduced population growth. Even though the United States is in a relatively strong position compared to many other developed nations in this regard, the latest Census estimates project that the prime working-age population, defined as individuals aged 25–54, will continue to decline as a share of the total population, falling from 40.5 percent in 2012 to 37.9 percent by 2040. By affecting the size of the labor force as well as the ratio of retirees to the working-age population, ongoing demographic changes have a direct impact on the long-run growth of the economy.

This chapter begins by describing the demographic and labor force trends that pose challenges in the near future. It next turns to education and the steps the President has taken to ensure that all Americans have access to the education and training they need to succeed in the changing labor market. The chapter ends with an overview of immigration and its potential to help address both of the challenges ahead—the need for more workers and the need for a more skilled, innovative, and entrepreneurial workforce.

Box 4-1: Minimum Wages and Employment

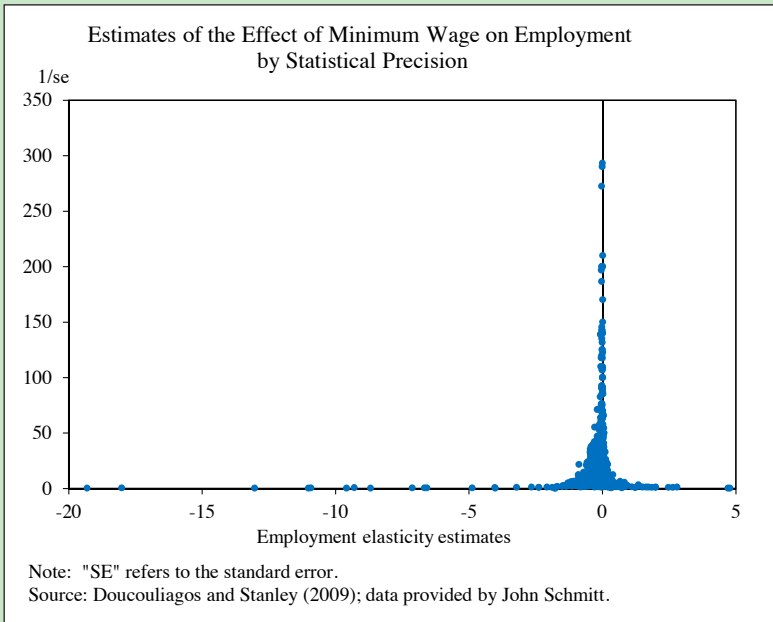
In his State of the Union address, delivered on February 12, 2013, President Obama called on Congress to raise the Federal minimum wage from \$7.25 to \$9.00 in stages by the end of 2015 and index it to inflation thereafter. His guiding principle was that in the wealthiest nation in the world, no one who works full-time should have to live in poverty. By way of example, President Obama noted that a full-time worker making the minimum wage earns \$14,500 a year. Even with the tax relief for lower-income workers that exists in current law, a family with two children and one minimum wage income still lives below the poverty line. Raising the minimum wage to \$9.00 would raise the wages of approximately 15 million workers. In addition to making America a magnet for jobs and equipping workers with the skills they need, ensuring that hard work leads to a decent living is a cornerstone of the President's vision to build a stronger economy.

Economists have long studied how the minimum wage affects employment and the economy. A comprehensive survey article written in 1982 concluded that a 10 percent increase in the minimum wage lowers teen employment by 1 to 3 percent. While this reflected the opinion of most economists at the time, the consensus view among economists has since shifted as more evidence has accumulated. Indeed, by the early 1990s time-series estimates of the effect of the minimum wage on teenage employment were turning up statistically insignificant effects (Wellington 1991). The 1999 *Economic Report of the President* concluded that “modest increases in the minimum wage have had very little or no effect on employment.”

The shift in consensus reflects two decades worth of studies that have made some methodological advances in the field. Since the 1990s, after the shift in the time-series evidence, economists have used differences across states in the level and timing of changes to minimum wage laws to study the effect of the minimum wage on employment of low wage workers (Card 1992). This approach arguably produces more robust estimates than the previous time-series approach of relating changes in nationwide teenage employment to movements in the federal minimum wage because it allows researchers to do a better job of controlling for other factors, such as underlying economy-wide trends, that might also affect low-wage employment. A further refinement of the state-level analysis is to focus more specifically on comparisons of adjacent states, which has the advantage that underlying economic trends are more likely to have had similar effects on nearby states (Card and Krueger 1994). A particularly compelling recent study takes this approach a step further by comparing all contiguous county-pairs in the United States

that are located on the opposite side of a state border (Arindrajit Dube, T. William Lester, and Michael Reich 2011). The authors show that workers benefited in states that increased their minimum wage, such as California, Rhode Island, New York, Vermont, and Washington, relative to similar workers across the state borders. The study concluded, “For cross-state contiguous counties, we find strong earnings effects and no employment effects of minimum wage increases.”

A meta-analysis by Doucouliagos and Stanley (2009) of 64 studies on the minimum wage published between 1972 and 2007, encompassing over 1,000 estimates, finds that most estimates are concentrated around zero, indicating no detectable effect (see figure). The authors conclude that the available research finds “no evidence of a meaningful adverse employment effect” of the minimum wage.



Commonsense immigration reform can be a key contributor to future economic growth and job creation.

DEMOGRAPHIC AND LABOR FORCE TRENDS

The U.S. adult civilian non-institutional population stood at 237.8 million in 2010 and is projected to reach 263.0 million by 2020, growing at a projected annual rate of 1.0 percent, down from 1.1 percent in the 2000s and

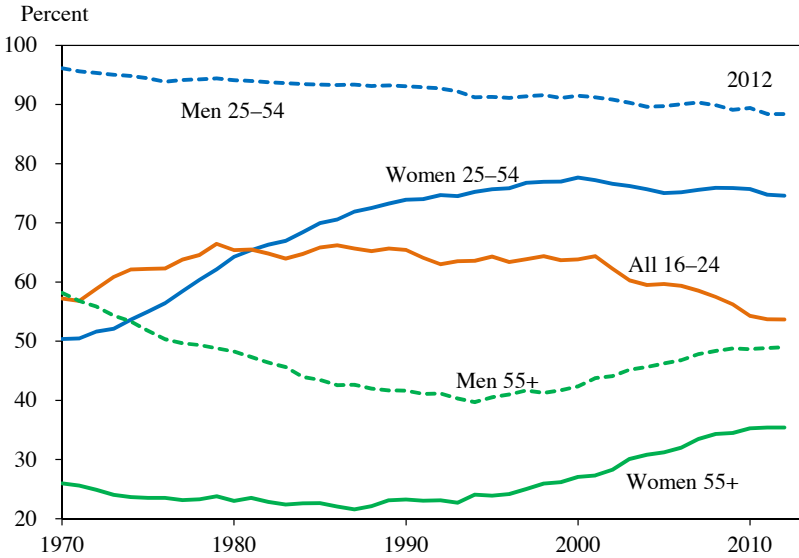
1.2 percent in the 1990s. Further, the share of older Americans is projected to grow over the 2010–20 period, with the number of individuals aged 55 and older increasing 2.6 percent a year, while the number of 16–24 year olds remains roughly constant and the size of the working-age population grows by just 0.3 percent a year (Toossi 2012). These population projections reflect the aging of the baby-boom generation born between 1946 and 1964. Because older men and women are considerably less likely to participate in the labor force than younger individuals, these demographic trends imply that the fraction of the population in the labor force will fall. This trend has already begun.

After increasing at a steady clip for two and half decades starting in the mid-1960s, labor force participation exhibited slower growth during the 1990s and began to fall during the 2000s. The overall labor force participation rate (LFPR), which peaked at 67.1 percent in 2000, fell to 63.7 percent in 2012. Approximately half of this decline can be attributed to the aging of the population and the retirement of the oldest members of the baby-boom generation together with long-term declines in labor force participation among several of the groups shown in Figure 4-1 not related to cyclical factors (see Table 2-1 in Chapter 2).

As the figure illustrates, participation rates have fallen for all major demographic groups since 2000 with the exception of men and women aged 55 and older. The LFPR for younger men and women fell in the 2000s, although the decline for men is a continuation of a long-term trend, whereas the gradual decline for women in the 2001–07 recovery is a new development that reverses a long period of rising participation. The labor force participation rate for 16–24 year olds has dropped precipitously since 2000 after trending down since 1980.

Recent studies suggest two different explanations for the declining trend among teens and young adults. On the one hand, the increasing monetary return to educational attainment has made it more likely that young people enroll in school rather than become employed. One recent study found that while about two-thirds of the decline in participation among teens stems from an increasing share of teens enrolled in school, an additional portion is due to declining participation among those enrolled in school (Aaronson, Park, and Sullivan 2007). To the extent that young people are forgoing work for education, the decline in their labor force participation is less of a concern because they are acquiring skills that will raise their productivity when they do enter or return to work. Less optimistically, other researchers have argued that competition for low-wage jobs has been a major cause of the decline in the teen LFPR, with low-skilled adults now filling jobs that teenagers used to take (Smith 2011).

Figure 4-1
 Labor Force Participation Rate by Population Group, 1970–2012



Source: Bureau of Labor Statistics, Current Population Survey, Annual Social and Economic Supplement; CEA calculations.

On the other end of the age spectrum, older workers have increased their labor force participation. Researchers have identified rising education levels and the growth of white-collar and service jobs as important explanations. Other plausible explanations that have not yet been investigated fully are improved health and reductions in the value of retirement savings (Blau and Goodstein 2010; Maestas and Zissimopoulos 2010).

The labor force participation of working-age men has declined steadily since the 1970s. One likely factor behind this trend is that real wages have declined for less skilled men. Since the early 1970s, the average real wage has fallen about 25 percent for high school dropouts and about 15 percent for high school graduates with no further education (Acemoglu and Autor 2011).

The pattern for women has been different. During the 1970s and 1980s, the economy benefited greatly as married women entered the labor force and increased potential and actual gross domestic product (GDP). As Figure 4-1 above illustrates, the growth in female labor force participation abated in the early 2000s. Different forces appear to be at work for different groups of women. Gains in employment for less educated women during the 1990s were encouraged by policy changes (for example, the Earned Income Tax Credit and welfare reform) and by strong economic growth that was not sustained in the early 2000s. Highly educated women, particularly mothers,

have pulled back from the pattern of large increases in labor force participation observed in the 1970s and 1980s. Lack of hours flexibility and the challenges inherent in balancing career and family appear to be important factors for these women.

A Slowdown in Women's Participation Rates

Table 4-1 reports participation rates of working-age women in selected years that correspond to peak years of the business cycle and thus allow a focus on long-term trends. From 1969 to 1989, the labor force participation rate of working-age women increased 24.5 percentage points. The most dramatic changes in participation have occurred among married women, and more starkly, among married mothers. The LFPR among married mothers increased an astounding 31.4 percentage points from 1969 to 1999. Growth among all working-age women was slower during the 1990s, but the LFPR for working-age women increased another 4 percentage points to 77 percent in 1999. As the table shows, however, since 1999, the participation rate for these women has declined, falling to 75.6 percent by 2007.

Figure 4-2, which compares the participation rates of women born in different periods, provides insight into the rise and subsequent stagnation of participation among married mothers. Among women born between 1936 and 1945, labor force participation is moderately high at younger ages, drops during the peak child-bearing years, exhibits a subsequent reprise in mid-life, and finally declines as retirement approaches. The curve tends to rise across successive generations of women, indicating higher participation rates for each successive cohort, and the dip associated with child-bearing ages has largely disappeared. The rise in participation, however, appears to have stopped with the most recent generation. Given this pattern across birth cohorts, it is difficult to be optimistic about future increases in the labor supply of prime-age women. New birth cohorts work no more than the immediately preceding cohort at the same ages, and it is therefore unlikely they will work more at later ages. The gains during the 1970s and 1980s achieved from the increased participation of married mothers appear to have come to a standstill and perhaps even partially reversed.

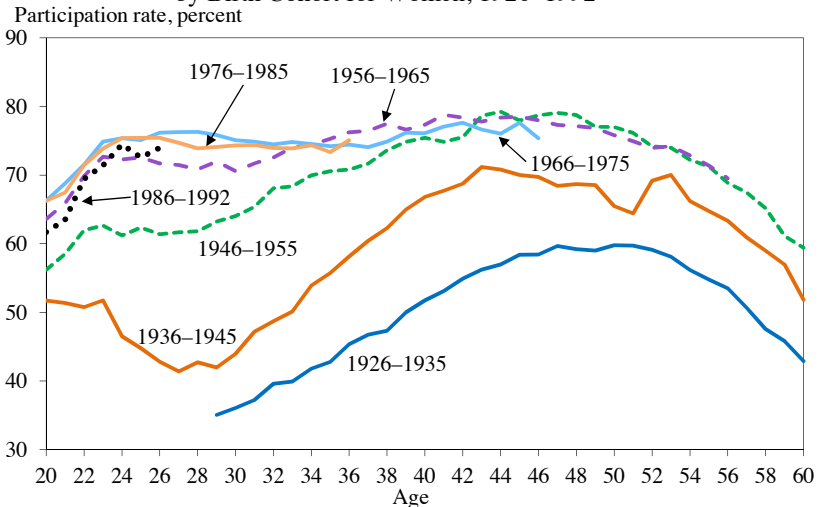
What has brought about this change? One candidate explanation—that labor market prospects have declined for women in the 2000s—cannot be the whole story, since participation has fallen even among groups for whom average wages have risen. For example, according to one recent investigation, the average weekly wage of women aged 25–39 with a college degree increased 2.4 percent from 1999 to 2007, after adjusting for inflation, even as the share of this group who are employed fell 3.0 percentage points (Moffitt 2012).

Table 4-1
Labor Force Participation Rate of Women Aged 25-54, 1969-2007

	Percent				
	1969	1979	1989	1999	2007
Prime-Age Women	48.8	62.1	73.3	77.0	75.6
<i>Marital Status</i>					
All married	43.5	57.4	70.2	74.1	73.3
Widowed/divorced	69.6	73.4	78.4	81.6	79.0
Never married	80.5	80.8	81.8	82.6	79.9
<i>Marital status and presence of children</i>					
Married mothers	40.8	54.4	67.8	72.2	71.6
Widowed/divorced mothers	65.5	70.9	76.1	82.5	81.2
Never-married mothers	50.4	57.6	64.0	78.4	75.4
<i>Race</i>					
White	47.6	61.6	73.3	76.9	75.6
Black	58.7	66.5	74.1	79.6	77.8
Other	49.1	62.3	69.5	71.4	72.1
<i>Education</i>					
High school dropouts	45.0	48.7	51.3	56.1	53.2
High school graduates	49.8	62.7	73.4	75.2	73.2
Some college	48.2	66.9	78.3	80.2	79.1
College graduates	58.2	74.9	83.4	84.3	81.8

Source: Bureau of Labor Statistics, Current Population Survey; CEA calculations.

Figure 4-2
Age-Specific Labor Force Participation Rate
by Birth Cohort for Women, 1926-1992



Source: Bureau of Labor Statistics, Current Population Survey, Annual Social and Economic Supplement; CEA calculations.

The one subgroup of women most likely to have been affected by declining labor market prospects is never-married mothers, a population that tends to have lower levels of education and correspondingly lower wages. As Table 4-1 illustrates, the labor force participation of these women rose dramatically from 64.0 percent in 1989 to 78.4 percent in 1999. One factor contributing to this increase was the 1996 welfare reform act, which replaced the welfare entitlements embodied in the old Aid for Families with Dependent Children with more temporary and conditional assistance under the Temporary Assistance to Needy Families program (Blank 2002; Moffitt 2003; Grogger 2003). Another important factor was the expansion of the Earned Income Tax Credit (EITC) in 1986, 1990, and 1993, which made work more attractive and encouraged the entry of low-wage workers into the labor force (Eissa and Liebman 1996; Meyer and Rosenbaum 2001). The impacts of these program and tax changes were amplified by the strong labor market of the second half of the 1990s, a situation that was not sustained as labor markets weakened in the 2000s. The further expansion of the EITC under the Recovery Act and the American Taxpayer Relief Act, and increasing and indexing the minimum wage as proposed by President Obama, would be expected to encourage greater labor force participation for this group in the future.

Work Schedules and Workplace Flexibility

Recent studies that examine the career trajectories of highly educated women in business and law provide some perspective on the challenges women face as they attempt to balance career and family. One study followed a cohort of University of Chicago graduates who had earned a master's in business administration (Bertrand, Goldin, and Katz 2010). While male and female graduates started their careers with similar earnings, 17 percent of the women were not working at all 10 years later, compared with only 1 percent of the men. In addition, only 62 percent of female graduates were working year-round full-time 10 years after graduation, compared with more than 92 percent of the men. The lower levels of work among these career-minded women generally were associated with motherhood, suggesting that work-family balance issues played a role.

One way that women (and others with family responsibilities) may achieve greater flexibility for juggling these competing demands is to work part time rather than full time during some periods. Traditionally, however, given that part-time jobs tended to pay lower wages, the fact that women were more likely to be in part-time work was thought to be a major impediment to women gaining equal pay (Blank and Burtless 1990; Manning and Petrongolo 2008; Bardasi and Gornick 2008). In some cases, however,

offering part-time work—and greater hours flexibility more generally—may be seen by employers as a way to attract highly qualified workers, especially highly qualified women who might otherwise choose not to work.

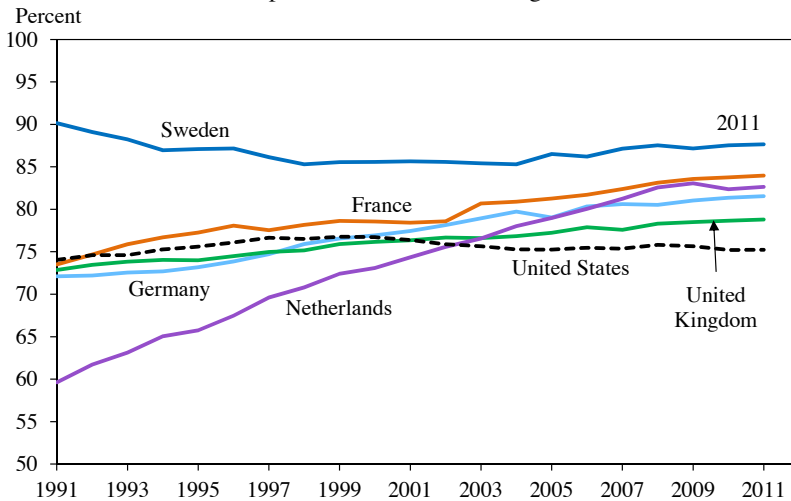
Other advanced economies appear to be offering a different mix of work schedules and employment opportunities. Figure 4-3 shows a comparison of labor force participation rates for women, 25–54 years old, in selected advanced economies. While participation rates in France, Germany, and the United Kingdom were slightly below the U.S. rate in 1991, they were higher than the U.S. rate by 2011. Much of the rapid rise in the European participation rates for working-age women has come from increases in part-time work. In contrast, women in the United States are more likely either to work full-time—defined as 35 hours or more a week—or not to work at all. Figure 4-4 shows that, among the selected countries, U.S. women are still the most likely to work full-time.

The labor force participation rate and average hours worked among those who do participate can be used to calculate average hours worked per woman across countries. In 2005–09, women worked an average of 26.8 hours a week in the United States, more than the average of 26.4 hours per capita in France, 24.4 in the United Kingdom, 22.3 in Germany, and 20.2 in the Netherlands. The U.S. average, however, was down from 27.4 hours a week in 1995–99, while women’s hours worked had risen in all the other countries.

A recent study by Blau and Kahn (2013) noted that in 1990, the United States ranked 6th among 22 developed countries in women’s labor force participation, but by 2010 the United States had fallen to the 17th position. Blau and Kahn found that the increased prevalence of “family-friendly policies”—parental leave as well as part-time work entitlements—in other developed countries can account for up to 29 percent of the decline in U.S. women’s LFPR relative to other countries. Among the countries shown in Figure 4-3, the greatest change in labor force participation for prime-age women occurred in the Netherlands, where the rate rose by nearly 20 percentage points between 1991 and 2011. During this period, the Netherlands instituted laws that mandate equal pay per working hour regardless of total weekly hours worked. These requirements were accompanied by other laws that establish employees’ right to request changes in their weekly working hours or request parental leave on a part-time basis (OECD 2012a). As Data Watch 4-1 highlights, the United States lags behind in the availability of both paid and unpaid leave.

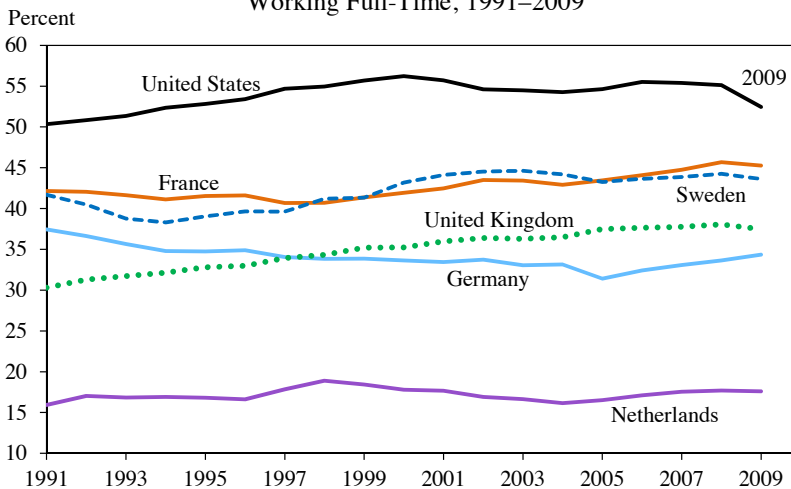
One question is whether rising labor force participation comes at a cost. In particular, women in other developed countries could be accepting lower wages in exchange for being able to work part-time or having access

Figure 4-3
Labor Force Participation Rate of Women Aged 25–54, 1991–2011



Note: Workers on leave are considered employed. The participation rates in the KILM data are harmonized to account for differences in national data and scope of coverage, collection and tabulation methodologies, as well as for other country-specific factors such as military service requirements.
Source: International Labour Organization, Key Indicators of the Labor Market (KILM).

Figure 4-4
Percent of Women Ages 25 Years and Older Working Full-Time, 1991–2009



Note: Full-time is defined as 35 hours per week or more. Workers on leave are considered employed. The participation rates in the KILM data are harmonized to account for differences in national data and scope of coverage, collection and tabulation methodologies, as well as for other country-specific factors such as military service requirements.
Source: International Labour Organization, Key Indicators of the Labor Market (KILM).

to other forms of workplace flexibility. Contrary to this notion, however, gender wage gaps are actually smaller in other developed countries than in the United States. For example, in 2010, the female-to-male hourly wage ratio was 77.7 percent in Germany, 78.7 percent in the United Kingdom, 81.9 percent in the Netherlands, 84.4 percent in France, and 84.4 percent in Sweden. In all of these countries, part-time work and other types of workplace flexibility, such as paid parental leave, are more available than in the United States, where the female-to-male hourly wage ratio was 75.0 percent. Part of what lies behind this phenomenon is that the wage distribution is more compressed in these other countries (Blau and Kahn 2003). Although women in the United States and France are at similar percentile positions of the overall wage distribution relative to their male counterparts, for example, wage compression translates into a much smaller gender wage gap between the average working man and woman in France compared to the United States. Comparisons across countries also suggest, however, that it is not inherently the case that greater flexibility implies lower wages.

Other recent work comparing wages and hours flexibility across occupations also challenges the notion that hours flexibility necessarily comes at a cost. Goldin and Katz (2012) provide an illustrative case study of the pharmacist occupation, where consolidation brought about by scale economies led to the rise of large retail giants. The new market structure made it possible for two part-time pharmacists to substitute for one full-time pharmacist, creating a much more flexible work environment for women. Notably, part-time pharmacists earn no less per hour than full-time pharmacists in contrast to other occupations employing female college graduates where working part-time is associated with wages as much as 20 percent lower. Among women aged 35–39 with pharmacy degrees, only 12 percent were not in the labor force, compared with 18 percent among other college graduates. The study also found that only 11 percent of women with active pharmacy licenses ever had a spell out of the workforce. Given this pattern of continuous participation, female pharmacists are likely to work more over their lifetimes than other women who start working long hours but drop out altogether mid-career as they face the often stark choice between work and family.

To be sure, not all occupations can easily accommodate flexible hours. There is some evidence, however, that even in fields such as medicine, where part-time work is rare, jobs may be evolving to accommodate more flexible schedules (Goldin and Katz 2011). More flexible schedules also seem to be gaining acceptance in the business community (CEA 2010). As more businesses adopt these practices, the cost to any one firm of their adoption will be lowered. An individual employer may be less likely to offer flexible work

Data Watch 4-1: New Evidence on Access to Paid Leave

The traditional family today is vastly different than it was decades ago. In contrast to 1975, when just 43 percent of women with children were working, nearly two-thirds of women with children were at work in 2010. The juggling of work and family is not a challenge for women alone. Among married households with children, 60 percent had two working parents. In addition, Americans are getting older. With an aging population, working families will face growing challenges in providing eldercare in the years to come. Access to paid leave and scheduling flexibility can help families deal with these challenges.

Each of the President's Budgets since FY 2011 has proposed money for a State Paid Leave Fund at the Department of Labor that would provide competitive grants to help cover start-up costs for states that choose to launch their own paid leave programs. The value to families of paid leave is illustrated by California's experience with its Paid Family Leave (PFL) program. Since 2004, employed individuals in California have been able to take up to six weeks of paid leave to spend time with a newborn or a newly adopted child or to care for a seriously ill relative. During this time, workers receive payments through the State Disability Insurance system for up to 55 percent of their earnings. A recent study found that the California program more than doubled the overall use of maternity leave, increasing it from around three to six or seven weeks for the typical new mother, with especially large growth among less advantaged mothers, while also raising the hours and wage incomes of employed mothers in the affected group by 6 to 9 percent (Rossin-Slater, Ruhm, and Waldfogel 2011).

The President's FY 2011 Budget included funding to add a module to the American Time Use Survey (ATUS) asking workers about the leave policies at their place of work. The module had questions on leave access, leave use, and unmet need for leave. Because the ATUS is linked to the Current Population Survey, rich data are available on the characteristics of people surveyed. The ATUS survey also provides much-needed information on workers' ability to adjust their schedules or location or to work from home, as well as other dimensions of work-place flexibility that can help in balancing work and family obligations.

This new survey indicates that a large fraction of American workers still lacks access to paid leave, including paid sick leave and paid family leave for the birth of a child. In addition, only 53 percent of the workers reported that they had the ability to adjust their schedule or work location. Previous studies using the National Compensation Survey have shown large disparities in access to paid leave by level of earnings. The new data confirm these findings and, in addition, docu-

ment large disparities in access to paid leave and scheduling adjustments across education groups and between Hispanics and non-Hispanics (see table). Those in the top quartile of earnings are 1.7 times as likely to have access to paid leave as workers in the bottom quartile (83 percent vs. 50 percent). College-educated workers are about twice as likely to have access to paid leave as workers without a high school degree (72 percent vs. 35 percent). Only 43 percent of Hispanics have access to paid leave, compared with 61 percent of non-Hispanics. Although a large and roughly similar share of workers in most groups has access to unpaid leave, that is a poor substitute for paid leave that can be taken when the need arises.

Access to Leave by Selected Characteristics, 2011

	Percent		
	Access to paid leave	Access to unpaid leave	Access to schedule adjustment or location
Total	59.0	76.6	55.9
<i>Gender</i>			
Male	60.3	75.4	55.5
Female	57.5	77.9	56.3
<i>Race/Ethnicity</i>			
White only	58.9	76.9	56.6
Black only	60.6	76.7	49.8
Asian only	62.2	72.1	59.8
Hispanic	43.0	71.2	48.2
Non-Hispanic	61.4	77.4	57.1
<i>Education</i>			
Less than high school	34.9	70.4	37.6
High school	61.1	75.8	48.2
Some college	66.4	78.2	55.8
Bachelor's or higher	71.6	75.3	60.5
<i>Weekly Earnings</i>			
\$0-\$540	50.1	78.0	47.2
\$541-\$830	77.1	78.9	48.8
\$831-\$1,230	81.3	74.9	51.4
\$1,230+	82.7	75.4	59.9

Notes: Education breakdown is only for individuals age 25 and over. Each earnings range represents approximately 25 percent of full-time wage and salary workers (except self-employed incorporated workers) who held only one job.

Source: Bureau of Labor Statistics, American Time Use Survey, Leave Module; CEA calculations.

schedules when other firms have not adopted the same practice out of the fear that it will attract less committed workers. This situation is similar to health insurance, where before enactment of the Affordable Care Act, a firm might not have offered health insurance in an environment where employer-provided health insurance was rare out of the fear that it would attract the least healthy workers. If all firms engage in the practice, the risk to any one firm is lowered.

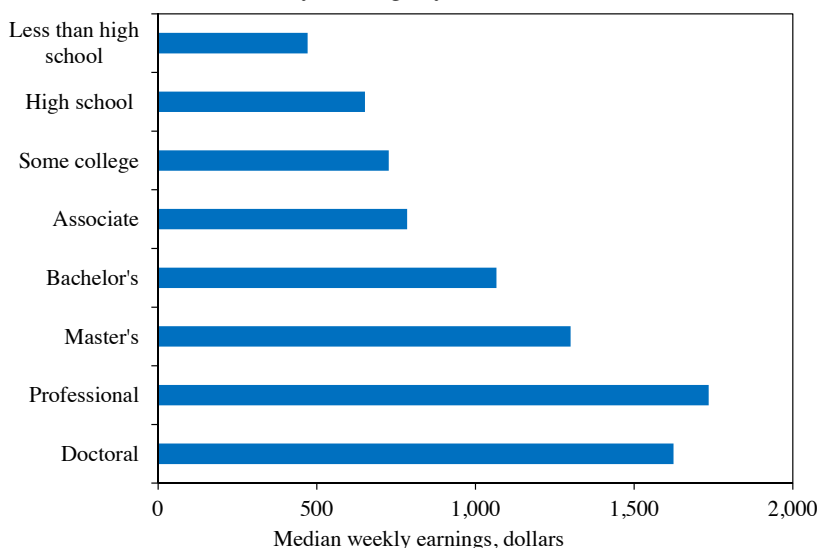
Such developments may well provide a boost to the economy. Women received a majority of both bachelor's degrees (57 percent) and master's degrees (60 percent) awarded in 2010. Educational attainment commands a high return in an increasingly knowledge-based economy. It is in society's collective interest to encourage women to make full use of these educational investments by remaining in the labor market where the return to their job-related skills can be realized.

GOVERNMENT AS A PARTNER IN HUMAN CAPITAL AND SKILL FORMATION

Overwhelming evidence shows that the average return to obtaining a college education is large. In 2011, the median weekly earnings of individuals with a bachelor's degree was \$1,053, compared with \$638 for individuals with only a high school diploma—a 65 percent premium for the college graduate. A bachelor's degree is also the gateway to other advanced degrees that command even higher earnings premiums (Figure 4-5). The premium for college and beyond has been rising since 1980 and has continued to increase, albeit at a slower rate than in the 1980s (Acemoglu and Autor 2011). Because the number of college graduates also has been increasing over this time, the rising premium is a signal that the economy is demanding still more college graduates.

From a national perspective, an educated workforce is vital. The productivity of a nation's labor force is a key input into future economic growth, and the most direct prescription for increasing labor productivity is investment in skills. The United States has historically been a leader among developed countries in the share of its population with postsecondary education (referred to by the Organisation for Economic Co-operation and Development as "tertiary" education). That standing has fallen over the past generation, with the United States now ranked 14th among a set of 34 industrialized nations in the share of 25–34 year olds with such education (OECD 2012b). While other measures can be used to assess a nation's ability to educate its workforce—including measures of educational quality, test scores, and how well people with skills are matched to jobs that can make use

Figure 4-5
Median Weekly Earnings by Education Level, 2012



Note: Data are for full-time wage and salary workers, 25 years and older.

Source: Bureau of Labor Statistics, Current Population Survey.

of them—the fall in the U.S. postsecondary education ranking is a reminder that we have more to do to provide America’s workers with the skills to compete in today’s economy.

Early learning and the quality of education from kindergarten through high school (K–12) are key determinants of successfully completing a college degree. Study after study finds that early life conditions have persistent and large effects on later life outcomes such as high school graduation rates, employment, and earnings (Cunha and Heckman 2008; Cunha, Heckman, and Schennach 2010; Almond and Currie 2011). In his State of the Union address delivered to Congress on February 12, 2013, President Obama proposed to work with states to make high-quality preschool available to every single child in America. Four years ago, the President launched the Race to the Top competition, which has proven to be successful in convincing states to develop smarter curricula and higher standards for grades K-12. In his 2013 State of the Union address, the President announced a new challenge to high schools to partner with colleges and employers to better equip students with the problem-solving and math skills that are in demand in today’s high-tech economy.

President Obama wants to make the United States the leader in postsecondary attainment. In his address to Congress on February 24, 2009, he set 2020 as the year by which the Nation would once again have the highest

proportion in the world of young people graduating from college. The U.S. Department of Education projects that the share of college graduates will need to increase by 50 percent to achieve this goal. That means 8 million more young adults will need to earn associate degrees, bachelor's degrees, and meaningful postsecondary certificates by 2020. To achieve this ambitious goal, the higher education system must undertake far-reaching reforms to improve college readiness, widen access, ensure quality, promote affordability and value, and accelerate completion. Colleges and universities in every state have a vital role and a unique opportunity to help America again lead the world in college attainment.

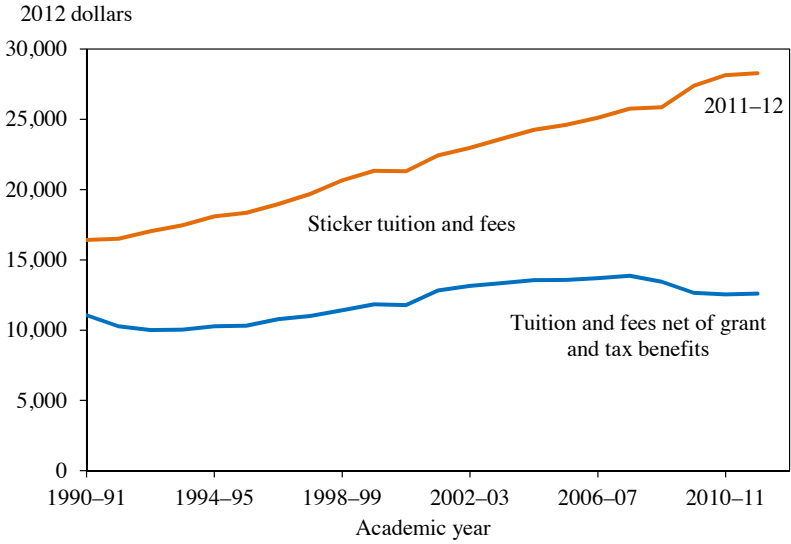
Giving America's workers the skills to compete for good jobs will require the necessary resources to educate millions of additional students. Unfortunately, State and local government support for higher education—traditionally the cornerstone of public higher education funding—has been falling for at least a decade. From 2000 to 2010, State appropriations for public four-year institutions fell from \$8,029 to \$6,388 per full-time student, while appropriations for public community colleges fell from \$7,095 to \$5,712 (in 2010 dollars).¹ This sharp drop in State support has left postsecondary institutions in need of alternative revenue sources, including additional tuition dollars. In fact, in 2010, for the first time ever, public research and master's institutions received more revenue from tuition than from State appropriations. While State appropriations fell only 0.4 percent in 2012, the effects of budget cuts stemming from the economic downturn are expected to last for some time.

Sticker tuition is the price of tuition advertised by the individual colleges. Net tuition is the price students actually pay after deducting Federal, State, and private aid, as well as various discounts offered by the institutions themselves. Between 2000 and 2012, sticker tuition increased from \$4,860 to \$8,370 (in 2012 dollars) per full-time student at public institutions, an increase of \$3,510, and from \$21,310 to \$28,280 at private institutions, an increase of \$6,970 (Figure 4-6). Net tuition per full-time student has increased much less than sticker tuition, going up \$1,260 at public institutions and \$820 at private institutions over this period. The relatively modest increase in the net cost of attending college resulted in large part from Federal policies aimed at reducing the price of education. President Obama has worked to expand these Federal programs. Expanded Pell Grants made college more affordable for 9.4 million low-income students in 2011

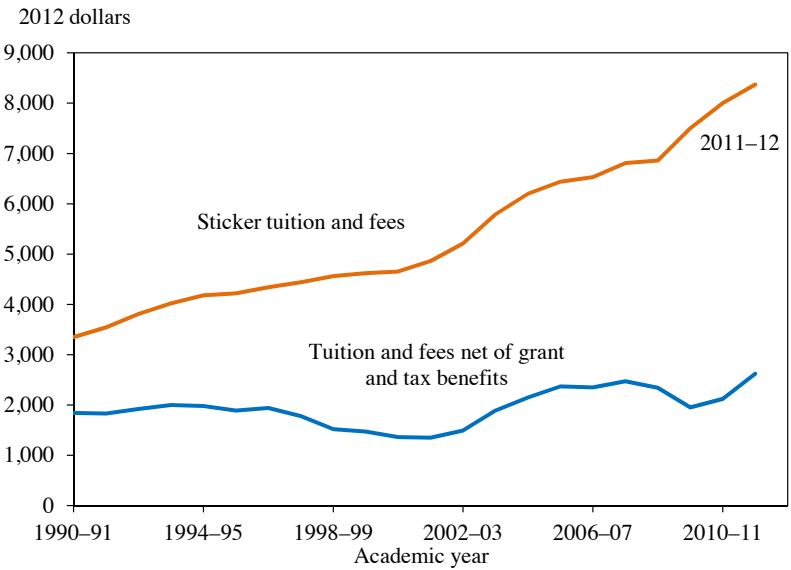
¹ States provide substantially less appropriations to private institutions on a per-student basis. State funding for private institutions was more stable over this period. For example, state appropriations per full-time student rose from \$513 to \$523 at private research institutions and fell from \$537 to \$288 at private master's institutions. (College Board 2010). See: <http://chronicle.com/article/State-Spending-on-Higher/136745/>

Figure 4-6
Tuition and Fees for Full-Time Undergraduate Students, 1990–2012

a. Private institutions



b. Public institutions



Source: The College Board, Annual Survey of Colleges, Trends in Student Aid (2012).

(2.4 million more than in 2009), and the establishment of the American Opportunity Tax Credit (AOTC) has lowered the cost of attending college for millions more.

Expanded Pell Grants

Pell Grants are the foundation of the Nation's efforts to make college affordable for students from lower- and middle-income families. Pell Grants help more than 9 million Americans a year pay for college, but the purchasing power of these grants has diminished over time. Recognizing the importance of the Pell Grant program to so many people, President Obama worked aggressively to increase the maximum award. The Health Care and Education Reconciliation Act, signed into law in 2010, raised the maximum grant from \$5,550 for the 2012–13 academic year to \$5,975 in 2017–18. The Act invests approximately \$40 billion a year in Pell Grants to ensure that all eligible students receive an award and that these awards will be increased in future years to keep pace with inflation. These steps, together with the funding provided in the American Recovery and Reinvestment Act of 2009 (the Recovery Act) and President Obama's first two Budgets, more than doubled the total amount of funding available for Pell Grant awards.

President Obama also took steps to stabilize Pell Grant funding. In the past, the budgeting process for Pell Grants often led to funding shortfalls, as Pell Grant funding is subject to the annual appropriations process rather than financed through mandatory funding. The appropriations bill that funds Pell Grants for the upcoming academic year is passed almost a full year before the funds become available, and thus the funding is established before it can be clear what the program will cost. The recent shortfall was expected to be particularly severe because of the large number of students qualifying for the award. The Act covered the expected funding shortfall and much of the recent growth in Pell costs, putting the program on a sounder footing going forward. The Act increased investments in Pell Grants by reforming existing student loan programs to deliver loans directly to students instead of subsidizing banks through the more costly Federal Family Educational Loan program. Direct student loans are more efficient and affordable for taxpayers, and the reform allowed more than \$60 billion to be reinvested in Pell Grants and other programs that support and sustain college access, while cutting billions from the national deficit (CBO 2010).

Expanded American Opportunity Tax Credit

Tax credits for higher education expenses were substantially expanded by President Obama in the Recovery Act. Before 2009, taxpayers could claim either the Lifetime Learning Credit or the Hope Scholarship Credit toward

higher education expenses. The Recovery Act established the American Opportunity Tax Credit, an expanded version of the Hope Credit. The AOTC offers a larger maximum benefit, makes more middle-income taxpayers eligible, and is partially refundable. These provisions substantially enlarged both the pool of taxpayers eligible for education tax credits and the amount of money available to qualifying taxpayers.²

In 2010, the AOTC was one of the most widely used education tax incentives, with 11.9 million taxpayers (8.3 percent of all taxpayers) claiming the credit (Table 4-2). The AOTC benefits totaled \$12.3 billion, likely making the credit more important to college affordability than all other education deductions and credits combined. The benefits of the AOTC were spread throughout the income distribution with low- and middle-income families receiving substantial benefits. Seventy-nine percent of the beneficiaries had household incomes below \$100,000, and 13.1 percent of beneficiaries had household incomes below \$25,000. The refundable aspect of the AOTC was particularly beneficial to low-income households. In 2010, AOTC benefits claimed as refundable credits were worth a total of \$6.0 billion to American households, with those benefits flowing overwhelmingly to households with incomes under \$50,000. The majority of beneficiaries of the refundable portion of the AOTC—63.6 percent—had household incomes under \$25,000. In recent budget negotiations, the Administration achieved an agreement with Congress to extend the AOTC for an additional five years. If the AOTC program had been allowed to expire, 11 million college students and their families would have seen tax increases averaging \$1,100. President Obama has called on Congress to make this tax credit permanent so that families can plan ahead and count on this credit for all four years of college.

Aggregate Student Loan Debt

While net tuition has risen considerably less than sticker tuition, for some low- and middle-income families, even the rise in net tuition may have put a quality education out of reach; for other students, the rise in college costs has led to substantially higher levels of borrowing. Aggregate student debt has grown steadily, from \$241 billion in the first quarter of 2003 to \$966 billion in the fourth quarter of 2012 (in dollars not adjusted for inflation). In contrast, after increasing earlier in the 2000s, aggregate amounts of other types of consumer debt, including mortgages, home equity loans,

² The AOTC is available to taxpayers with income below \$90,000 (\$180,000 if married), offering a maximum credit amount of \$2,500 per student for the first four years of postsecondary education; students must be enrolled at least part-time and be pursuing a degree to be eligible. The AOTC is 40 percent refundable, meaning that taxpayers with no tax liability can claim up to \$1,000 toward higher education expenses.

Table 4-2
Education Tax Incentives: The American Opportunity Tax Credit, 2010

Income Class	Returns	Amount (thousands of dollars)	Percent of income class benefitting	Percent of total benefit
\$0 to \$24,999	2,829,111	1,605,855	4.8	13.1
\$25,000 to \$49,999	3,628,972	3,579,601	10.5	29.2
\$50,000 to \$99,999	3,628,533	4,500,639	11.8	36.7
\$100,000 to \$199,999	1,776,318	2,582,592	12.4	21.0
\$200,000 or more	4,122	3,385	0.1	0.0
All returns, total	11,867,055	12,272,073	8.3	100.0

Source: Internal Revenue Service, Statistics of Income.

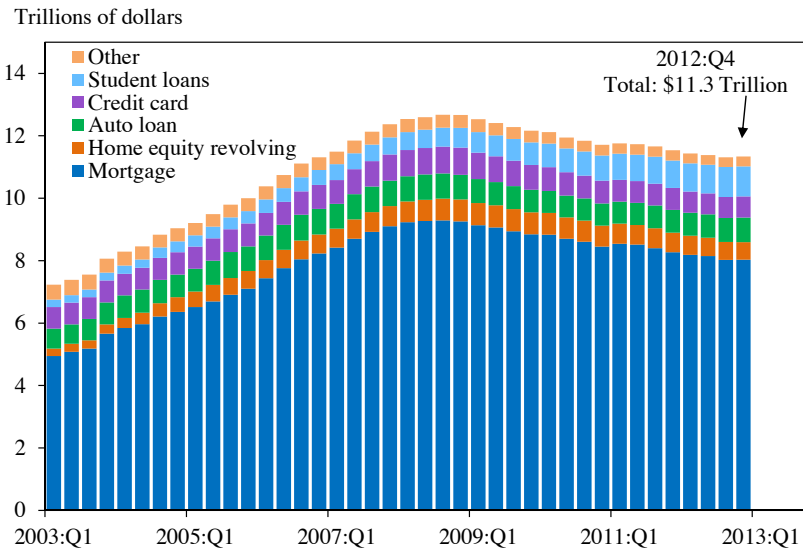
and credit card and auto debt, have fallen since the financial crisis (Figure 4-7).³ In fact, more student loan debt is now outstanding than either credit card debt or auto loan debt; only the mortgage debt category is larger. This rise in aggregate student loan debt, coupled with an increase in the share of student borrowers in delinquency status, has focused growing attention on student borrowing.

The rise in aggregate student debt—apparent even after adjusting the figures to account for inflation—has been driven partly by increased enrollment in postsecondary education (Figure 4-8). Between 1990 and 2012, the number of students attending college increased from 13.8 million to 21.0 million. From this perspective, the rise in aggregate student debt is partly the result of increased investment in human capital, which can be expected to lead to higher wages in the future and to a more prosperous standard of living for the cohorts who have been entering the labor market. The rise in aggregate student debt also reflects increases in the share of students who take out student loans and increases in the amount they borrow. Total borrowing has fallen in the aftermath of the financial crisis, and some of the increase in student debt may reflect families taking out student loans rather than home equity lines of credit to pay for college, but concern has been expressed about the increase in student debt.

Among students who received a bachelor’s degree from a four-year public college between academic years 1999–2000 and 2010–11, the share who took out student loans rose from 54 percent to 57 percent. More importantly, the average loan amount rose by 16.1 percent, from \$20,500 to \$23,800 (in constant 2011 dollars). Sharply rising student loan debt not only threatens the financial stability of recent graduates but also may serve as a disincentive for younger students who are deciding whether to invest

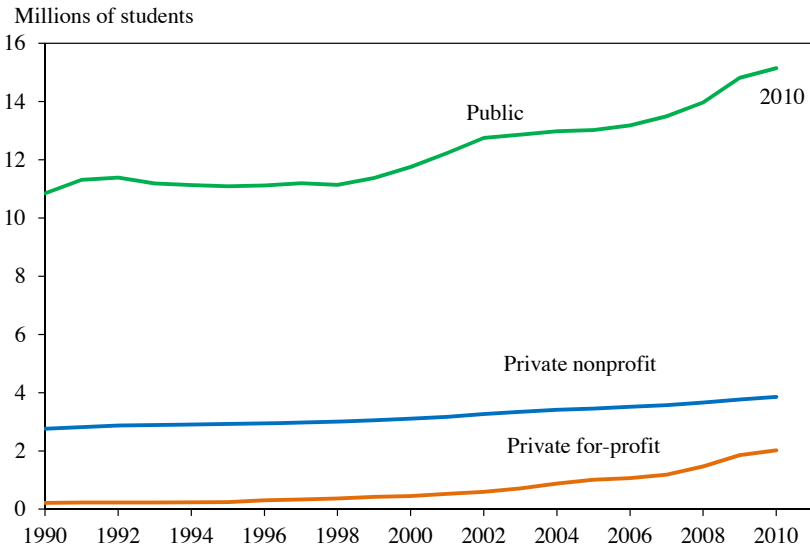
³ Aggregate mortgage debt peaked in 2008:Q3, home equity debt peaked in 2009:Q1, and auto debt, credit card debt, and other debt peaked in 2008:Q4.

Figure 4-7
Compositions of Household Debt Balance, 2003–2012



Source: Federal Reserve Bank of New York, Quarterly Report on Household Debt and Credit.

Figure 4-8
Total Postsecondary Enrollment by Type of Institution, 1990–2010



Source: Department of Education, National Center for Education Statistics, Digest of Education Statistics (2011).

in their future and obtain a college degree. To help protect taxpayers, borrowers, and the broader economy against the threat of rising student loan delinquencies, the Administration has advanced several policies designed to make it easier for students to pay back their education loans and to hold schools accountable for poor student debt outcomes after graduation.

Income-Based Repayment

Since 2009, responsible former students have been able to enroll in an Income-Based Repayment (IBR) plan to cap student loan payments. In October 2011, the Administration announced a new “Pay As You Earn” option that will reduce monthly payments for about 1.6 million current college students and borrowers; eligible borrowers include those holding any type of Federal student loan, such as Stafford, PLUS, and consolidation loans (nonfederal loans and loans in default are not eligible). Starting in 2012, the new IBR option has allowed eligible students to cap their annual loan payments at 10 percent of their discretionary income. The amount that an eligible student borrower is required to pay each month is based on adjusted gross income (AGI) and family size. Specifically, the maximum monthly payment equals 15 percent of the difference between AGI and 150 percent of the poverty threshold for a given family size, divided by 12. Eligible borrowers never have to pay more than the maximum monthly threshold; if a borrower’s monthly payments are higher than this threshold, they may apply to have their monthly payments lowered. Ultimately, IBR helps responsible student loan borrowers continue to make payments on their student loans at a manageable rate. As of November 2012, the Department of Education estimated that approximately 1.37 million borrowers are participating in the IBR program.

Federal Loan Consolidation

The Administration also took important steps to allow student borrowers to better manage their debt by consolidating their Federal student loans. Starting in January 2012, an estimated 6 million current students and recent college graduates were eligible to consolidate their loans as a Direct Loan, and by so doing, reduce their interest rates. Before this policy change, approximately 5.8 million borrowers had both a Direct Loan and a Federal Family Education Loan. These loans require separate payments making borrowers more likely to default. By consolidating these loans, borrowers could achieve the convenience of a single payment to a single lender. Borrowers who took advantage of this consolidation option also received up to a 0.5 percentage point reduction in their interest rate on some of their

loans, which means lower monthly payments that may save each borrower hundreds of dollars in interest over the life of the loan.

The Growth of For-Profit Colleges

Although they still account for only a small fraction of all postsecondary education students, for-profit colleges are the fastest-growing type of postsecondary school. They offer both an opportunity and a challenge for America's system of higher education. For-profit colleges have been shown to be flexible and innovative in meeting the needs of many postsecondary students, especially those who seek a nontraditional education or who require flexible arrangements for receiving their education, such as on-line and evening courses. Many for-profit colleges respond quickly to the changing needs of employers, and they can play an important role in helping more Americans earn college degrees. However, the experiences of some students at for-profit schools have been a cause for concern.

For-profit colleges have shown mixed outcomes with respect to completion rates relative to other types of institutions. For-profit completion rates in one- and two-year programs tend to be higher than completion rates for similar programs at other schools, but completion rates in for-profit bachelor programs are significantly lower. Low graduation rates not only waste taxpayer funds devoted to subsidizing the cost of education but can lead to prolonged financial hardship for students who borrow to finance their education but do not gain a college diploma to add to their earning potential.

Students at for-profit schools are about twice as likely as other students to be idle—not working or enrolled in school—six years following matriculation. In 2009, 23.6 percent of enrollees at for-profit schools were idle six years later, compared with just 10.6 percent of matriculating students at four-year public and nonprofit private schools, and 13.3 percent of matriculating students at two-year public and nonprofit private schools. As a result, the average annual earnings of for-profit graduates are about \$2,000 less relative to their counterparts at other types of schools, after accounting for differences in student characteristics (Deming, Goldin, and Katz 2012). Yet another study that uses detailed data to take account of differences in student characteristics found large and significant earnings benefits from obtaining an associate degree from public and nonprofit institutions but not from for-profit institutions (Lang and Weinstein 2012).

Given the higher tuition costs at many for-profit institutions, students at these schools also leave with substantially higher debt than their counterparts at public and nonprofit schools. In 2007–08, 53 percent of bachelor's degree recipients at some for-profit four-year schools had accumulated

more than \$30,500 in debt, compared with 24 percent of graduates at private nonprofit schools and just 12 percent of public school graduates (Baum and Steele 2010). Default on student loans is a much more serious problem at for-profit schools. For fiscal year 2009, the three-year “cohort default rate,” which measures the percentage of borrowers who enter repayment with student loans and default over a three-year period, was 22.7 percent among for-profit students, compared with just 7.5 percent for private nonprofits and 11 percent for public institutions (Department of Education 2012).

Gainful Employment

In 2010 and 2011, the Obama Administration issued a broad set of rules to strengthen occupational higher education programs at for-profit, nonprofit, and public institutions by protecting students from aggressive or misleading recruiting practices, providing consumers with better information about the effectiveness of such education and training programs, and ensuring that only eligible students or programs receive aid. One notable provision in this set of regulatory reforms was the “gainful employment” rule, which made occupational programs ineligible for Federal aid if they failed to meet a set of tests related to students’ financial situations after graduation. While many occupational and for-profit institutions have pioneered new ways to reach adult students, offer online education, and meet the needs of employers, some programs have left students with large debts and poor employment prospects. Specifically, the rule stated that programs could become ineligible for financial aid if fewer than 35 percent of graduates were actively repaying their student loans; graduates were spending in excess of 30 percent of their discretionary income on student loan payments; and graduates were spending more than 12 percent of their total income on student loan payments. The gainful employment provisions were intended to align institutional incentives with the interests of students, by conditioning eligibility to receive Federal aid on student outcomes. In June 2012, a Federal judge vacated the key provisions of the gainful employment rule on the grounds that there was no factual basis for the rule’s 35 percent repayment standard and that the better-grounded debt-to-income ratio standards were so intertwined with the repayment standard as to invalidate the whole rule. The Department of Education has appealed a portion of the judge’s decision, asking that schools continue to be required to report information about their students’ loan repayment rates and debt-to-income ratio to the Department even if this information is not used to determine eligibility for Federal funds. The Obama Administration remains committed to the principles of accountability and transparency in the use of taxpayer funds in occupational higher education programs and will continue efforts to

provide students with good information about the quality and value of such programs.

What Is Driving Up Tuition Costs?

One often-posed explanation for the increase in tuition costs is that colleges require skilled labor inputs—highly educated instructors—and as education premiums rise, so do the costs of these skilled labor inputs. This explanation—an example of the Baumol’s cost disease (Economics Application Box 4-1)—may be a contributing factor at private colleges but is unlikely to be the major part of the story at public institutions. Over the period 2000–10, average full-time faculty salaries increased 2 percent at public four-year colleges and actually fell at community colleges. Instructional spending as a share of total costs has been falling at public colleges as institutions seek to cut costs by substituting non-tenured and adjunct faculty for full-time tenure-track faculty. Evidence is mixed on whether this compositional shift has hurt learning outcomes with some arguing that graduation rates have suffered while others find no measurable changes. But, faculty salaries have not driven up costs.

So, what is driving up tuition costs? A recent survey article by economist Ronald Ehrenberg suggests that no single answer fits across all institutional types. Different types of institutions—private and public universities engaged in research, private and public institutions largely devoted to teaching, and public community colleges specializing in two-year instructional programs—are subject to different market forces and cost pressures (Ehrenberg 2012).

One driver of costs for many colleges is increased competition for students. The higher education market has been transformed from a state-based model where a majority of students attend local state universities to a more national—even international—market where students search over a large set of options. In this competitive environment, many institutions seek to position themselves as unique by offering an attractive mix of amenities. Published rankings likely contribute to this spending race because expenditures per student and average faculty salaries are often inputs into the rankings. Private research institutions, including the elite private universities, are in the best position to compete in this environment. These universities seek to have the most appealing facilities and the most renowned research faculty, and so at these types of institutions, the rise in tuition reflects rising average expenditure per student. At private research institutions, average spending per full-time equivalent (FTE) student on “education and related” items increased by more than \$10,000, from \$42,449 in 2000 to \$52,710 in 2010, all measured in 2010 dollars. Spending increases have been fairly

Economics Application Box 4-1: Baumol’s Cost Disease (or Bowen’s Curse) and the Price of Education

In the 1960s, economists William Baumol and William Bowen developed the notion, known as “Baumol’s cost disease,” that in certain labor-intensive industries—the example they chose was the performing arts—there is less opportunity for productivity gains to reduce labor costs. The number of musicians needed to perform Beethoven’s Ninth Symphony is the same today as it was decades ago, but the number of workers needed to produce a single car has fallen considerably. Because markets dictate that wages remain comparable across industries for equally skilled workers, the relative price of products and services in sectors where productivity is stagnant will rise over time. Baumol’s cost disease has been cited as a partial explanation for the long-term growth in education costs. Compensation for higher-education faculty and administrators has been rising over time, even though productivity in education has changed very little.

Whether and to what extent Baumol’s cost disease plays a role in the continued rise in higher education cost is a topic of much debate. Regardless of its importance as a possible explanatory factor, improved technology and productivity growth offers a potential solution to growth in the cost of college, opening up potential new ways to deliver education. One such innovation is massive open online courses, or MOOCs, that can accommodate tens of thousands of students in a single class. Another promising innovation is courses delivered through a hybrid of online lectures and in-person tutoring. One study that used randomized trials found no significant difference in learning outcomes between traditional face-to-face statistics courses and hybrid online statistics courses, yet costs were lower in the hybrid course. Another study, also using a randomized design, found a slight advantage for live economics lectures over online lectures in the case where all ancillary materials such as web-based assignments and availability of tutors were comparable. The relatively small advantage demonstrated by live lectures, however, suggests there is room for considerable cost saving with relatively little reduction in learning outcomes (Bowen et al. 2012; Figlio, Rush, and Lin 2010).

evenly spread across categories such as instructional expenditures (faculty salaries and benefits), research (grants and contracts as well as matching funds), student services (admissions, registrar, and counseling services), and academic support (libraries and academic computing) (Figure 4-9a). While these increases may look like rising labor costs, spending on physical plant—“operation and maintenance costs”—has also increased. An important

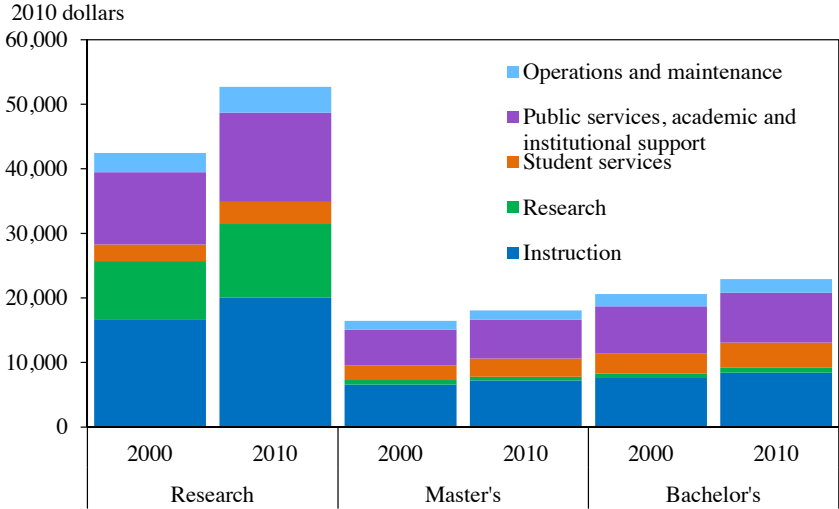
factor for private institutions is “tuition discounting,” or the share of each tuition dollar that is returned to students in the form of need-based or merit grant aid. Tuition discounting at these institutions is substantial and increased from 28.6 percent in 2000 to 33.1 percent in 2008. The ability to offer tuition discounts essentially allows institutions to price discriminate in order to obtain a diverse mix of students.

In contrast, at public institutions, where most students enroll, average spending per student has not risen nearly as much, and tuition increases largely reflect institutions’ attempts to compensate for declining State support (Figure 4-9b). At public community colleges, the average level of State and local appropriations per FTE student to these institutions fell from \$7,095 in 2000 to \$5,712 in 2010. Other public institutions lie somewhere between these two extremes, with public research institutions looking more like private research institutions, and public master’s- and bachelor’s-degree-granting institutions that are more oriented toward teaching looking more like community colleges. Average expenditure per FTE student at public research institutions increased from \$24,178 in 2000 to \$26,971 in 2010. Public research institutions shifted resources away from instructional spending by substituting non-tenured and part-time faculty for full-time, tenured faculty. Meanwhile institutional spending to support research activities increased, likely reflecting the attempt to gather new funding sources such as Federal and private research grants as State and local appropriations decreased. To compete with private universities for faculty who can attract Federal and private grants, public institutions often provide “start-up” research funds and build expensive lab facilities.

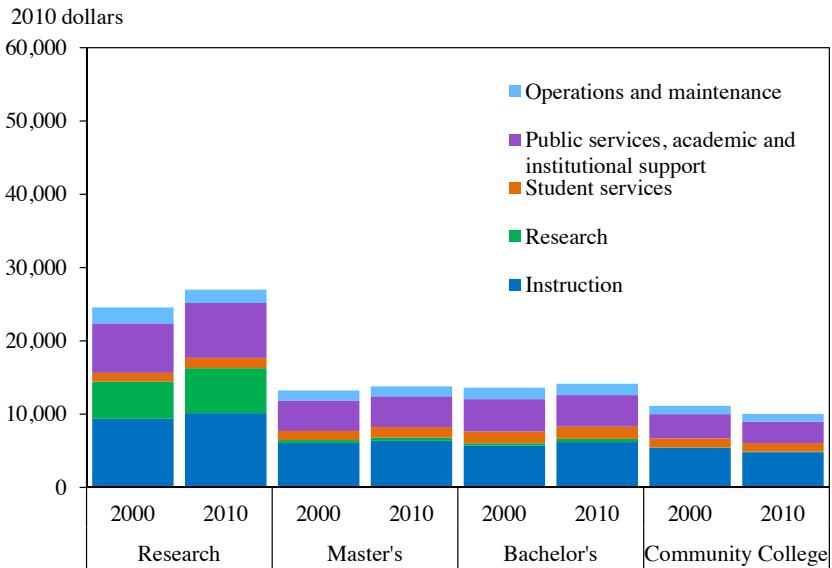
The Administration is committed to keeping college affordable for middle-class families. The Department of Education has released a College Scorecard to provide transparency for families as they evaluate their options for their higher education. The Department, along with the Consumer Financial Protection Bureau, has also designed a College Shopping Sheet to help families and students understand exactly how much money they will owe at each of the schools to which they have been accepted. President Obama has proposed a Race to the Top: College Affordability and Completion challenge to reward States that increase the number of college graduates while containing the costs of tuition. The President has also called on Congress to work with him to hold colleges accountable by considering value, affordability, and student outcomes in making determinations about which colleges and universities receive access to Federal student aid.

Figure 4-9
Average Expenditures per Full-Time-Equivalent Student
by Component, 2000–2010

a. Private institutions



b. Public institutions



Source: Integrated Postsecondary Education Data System, Delta Cost Project.

Government as a Partner in Training

As part of the Administration's efforts to prepare workers for America's 21st century economy, meet the needs of local employers, and achieve President Obama's goal of ensuring that every American worker has the opportunity to secure at least one year of postsecondary education, the Department of Labor, along with the Department of Education, launched the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program. This \$2 billion initiative expands the capacity of community colleges to provide training and credentials to local workers needed for high-wage, high-skill employment in industries like advanced manufacturing, biotechnology, information technology, and other emerging fields. To date, the Department of Labor has awarded 45 grants to colleges across the nation to develop curricula for advanced manufacturing. For example, the Department of Labor funded the National STEM Consortium, led by Anne Arundel Community College in Maryland. This collaboration of 10 leading community colleges in nine states organized to develop nationally portable, certificate-level programs in science, technology, engineering, and mathematics and is also building a national model of multi-college cooperation in the design and delivery of high-quality, labor-market-driven occupational programs. Spokane Community College, in partnership with 11 other community colleges, worked with aerospace employers including Boeing to design an advanced curriculum in aerospace maintenance and manufacturing. The consortium known as Air Washington has been recognized by the Boeing Company for this curriculum development and for its ongoing assistance to the Boeing Academic Alignment Team. This effort includes the development of a pre-employment program to offer training in basic aerospace-related skills to adult learners, a web-based curriculum component on English as a second language, and assessments of prior learning, particularly for active military or veterans, to evaluate credit and classroom advancements based on military experiences and training. The programs funded by TAACCCT are establishing a national repository of high-quality technical curricula and related materials that can be made available at no charge to community colleges around the country.

Several existing U.S. training consortia provide successful models. Among those worth noting are Project QUEST and the Wisconsin Regional Training Partnership. Project QUEST is a training program in San Antonio aimed at the working poor with high school diplomas. The program works with firms (many of which are hospitals) in the city to identify job openings and the skills required to fill them. The firms then make a good-faith pledge to hire program graduates into jobs that meet living-wage standards and may redesign their jobs to create advancement ladders. The training is

provided by local community colleges and typically lasts a year and a half. The program, which offers modest financial support and extensive counseling to the trainees, is organized and managed by a nonprofit closely linked to a community-based organization. More than 2,000 people have participated in QUEST. An evaluation found that those who completed the program saw their earnings rise by an average of \$5,000 a year (Kochan, Finegold, and Osterman 2012). The Wisconsin Regional Training Partnership was established by unions and firms in Milwaukee in the 1990s and does training for manufacturing and construction. A study with random assignment of participants to treatment and control groups found significant increases in employment and incomes for program participants compared with non-participants (Holzer 2011).

Key features of these successful programs are the involvement of industry and worker-focused organizations, along with a commitment to continually evaluate what works and what does not, and a willingness to make adjustments. The involvement of employer groups ensures that the training is relevant; the involvement of worker-focused organizations ensures that workers share in the gains of their improved productivity. Together, the groups can work together to upgrade jobs, rather than taking current job duties and career paths as given. In some cases, as in the Wisconsin program, upgrading has meant calling on other agencies (in that case, the federally funded Manufacturing Extension Program) to help firms upgrade their management, operations, and information-technology practices so that they offer a greater return to skill (Maguire et al. 2010). The programs also have used a variety of tools (focus groups with employers, unions, and workers but also randomized controlled trials) to evaluate their programs, adjusting if necessary based on the results.

IMMIGRATION

We are a nation of immigrants and their descendants. Now, more than ever, the economic and social benefits of immigration loom large. Immigrants increase the size of the population and thus of the labor force and customer base, making an important contribution to economic growth. In 2010, there were nearly 40 million foreign-born people in the United States, representing 13 percent of the population and 16 percent of the workforce. As the United States faces the prospect of a slow-growing population, immigrants are likely to play an increasingly important role in the American economy. Immigrants work in diverse industries and occupations. While they represent 16 percent of the workforce, they account for more than 20 percent of workers in agriculture, construction, food services, and

information technology. They are agricultural laborers, domestic workers, and cabdrivers as well as health care workers, computer software engineers, and medical scientists (Singer 2012). This diversity promotes economic growth as immigrants and natives often specialize in different tasks and occupations.

In addition, many highly skilled workers in the STEM fields are immigrants, and research has shown that these workers contribute importantly to innovation and growth. Many immigrants start businesses and create jobs for American workers. The United States has a distinct advantage compared with other developed nations in that flexible labor markets and robust returns to skills encourage the in-migration of these highly qualified workers. Our open society also allows immigrants to integrate better than in other countries, and we benefit from their vitality and creativity. Commonsense immigration reform can honor America's historical legacy of welcoming those willing to work hard for a better life, while also promoting its national and economic interests.

A Brief History of U.S. Immigration Policy

International migration flows from developing to developed countries are on the rise across the world. According to the latest United Nations estimates, more than 200 million people, or 3.1 percent of the world's population, live in a country that is not their original country of birth. Table 4-3 shows immigrants as a share of total population in selected advanced economies. In addition to the historical immigrant-receiving countries such as Australia, Canada, New Zealand, and the United States, the European Union, Scandinavian countries, and even Russia now have substantial foreign-born populations.⁴

Between 2001 and 2010, 10.5 million foreign-born individuals received legal-resident status (green cards) in the United States. While this is a large number, Figure 4-10 illustrates that the flow of legal immigrants is only now surpassing levels attained at the turn of the 20th century, when the population was much smaller but immigration was virtually unrestricted. The figure also shows that immigrant inflows, as a share of the total population, are far below the levels reached in the 19th century. In reaction to the large inflows in the early 1900s, particularly from Eastern and Southern Europe, Congress enacted a national quota system in 1921. The 1965 amendments to the Immigration and Nationality Act repealed the national quota system and made family reunification a priority. Under current law, immediate relatives

⁴ The list does not include countries in the Middle East, such as Israel, Jordan, Kuwait, Qatar, and United Arab Emirates that have substantial guest-worker programs and foreign-born populations who generally make up 40 percent or more of the total population.

Table 4-3
Foreign-Born Persons in Selected Countries

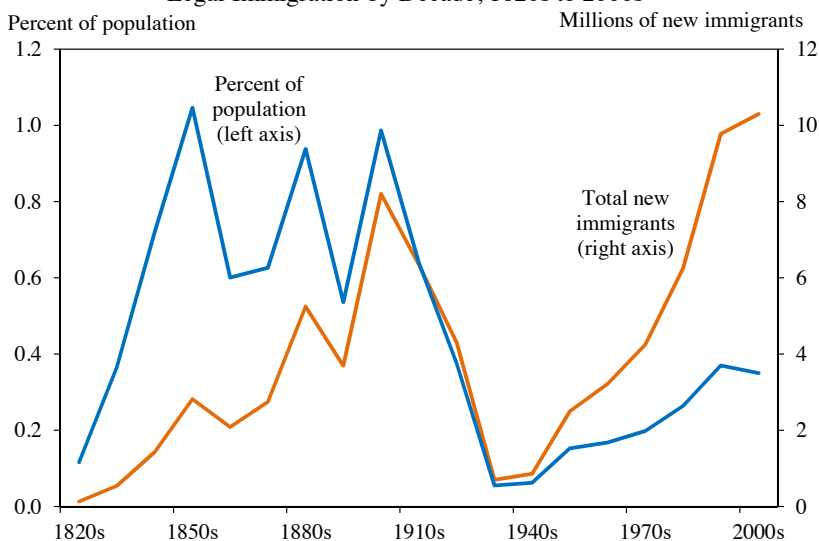
Country	Percent of Total Population	
	1990	2010
New Zealand	15.5	22.4
Australia	21.0	21.9
Canada	16.2	21.3
Spain	2.1	14.1
Sweden	9.1	14.1
United States	9.1	13.5
Germany	7.5	13.1
France	10.4	10.7
United Kingdom	6.5	10.4
Russia	7.8	8.7
Japan	0.9	1.7

Source: United Nations, Department of Economic and Social Affairs, Population Division, Trends in International Migrant Stock (2008).

of U.S. citizens—spouses, minor children, and parents—are not subject to annual numerical limits. For other family members including siblings and adult children of U.S. citizens and spouses and minor children of legal permanent residents, a numerical cap of 226,000 applies. Over the 10-year period from 2002 to 2011, an average of 469,777 immediate relatives of U.S. citizens and an average of 207,927 other family members obtained permanent residency status annually (DHS 2011). As a result of numerical limits and processing backlogs, applications in the “other family member” category have long waiting times. The longest waiting periods are for applications from countries such as China, India, Mexico, and the Philippines; under the law, no more than 7 percent of total family-sponsored visas can be allotted to any single country.

Foreign workers also come to the United States through employment-based green cards. A maximum of 140,000 employment-based slots for permanent residency are available each year, although the actual cap varies since unused visas in the family program are carried over to the employment system. On average over 2002–11, 157,181 employment visas were issued annually (DHS 2011). Employment-based green cards typically require the worker to have at least a college degree or documented evidence of special skills; only 10,000 employment-based green cards are available to workers without formal education or skill requirements. Individuals can obtain employment-based green cards for making large direct investments in job-creating enterprises, although this category is limited to approximately 10,000 visas.

Figure 4-10
 Legal Immigration by Decade, 1820s to 2000s



Source: Department of Homeland Security, Yearbook of Immigration Statistics (2011); Department of Commerce, Census Bureau.

Foreign-born individuals are also allowed to reside and work in the United States on a temporary basis through several temporary immigrant visa programs. For example, individuals are admitted to work in the agricultural industry (H-2A visas) and other seasonal industries (H-2B visas) for short durations on specific jobs with specific employers. These visas help alleviate peak seasonal demands in certain sectors of the economy but cannot be used to employ less-skilled workers for longer durations. H-1B visas permit temporary employment for skilled professionals who are sponsored by a U.S. employer, typically in science, computer, or engineering occupations. A worker can remain in H-1B status for up to six years. Current law permits 65,000 new H-1B issuances a year, although up to 20,000 individuals who either hold advanced degrees from U.S. universities or are going to work for institutions of higher education or government research organizations are exempt from the cap. Applications for the H-1B visa are accepted starting in April for the following fiscal year. The application window closes when the annual cap is met. Demand for H-1B visas slowed during the recent recession but has picked up again, pointing to increasing demand for workers in the rapidly growing STEM occupations. One study published by the Department of Commerce found that employment in STEM occupations increased 7.9 percent from 2000 to 2010 while employment in non-STEM jobs grew just 2.6 percent over the same period. Moreover, STEM

jobs are projected to grow by 17.0 percent from 2008 to 2018 (Langdon et al. 2011). In 2010, 151,710 foreign graduate students were enrolled in U.S. postsecondary institutions in STEM fields (NSF/NIH 2010). Allowing this population—already here and educated in the United States—to stay by increasing the number of visas available will ultimately position the Nation well in the global competition for new ideas, new businesses, and jobs of the future.

In part because of the limited pathways for less skilled workers to obtain legal status, an estimated 11.5 million foreign-born individuals in the United States are undocumented (Hoefer, Rytina, and Baker 2012). Bipartisan support for strengthened immigration enforcement has resulted in a well-resourced and modernized enforcement system. While effective, the fiscal burden of this system is also substantial. The Border Patrol has doubled in size over the past seven years to 21,370 agents in FY 2012. Spending for the two main immigration agencies—U.S. Customs and Border Protection and U.S. Immigration and Customs Enforcement—surpassed \$17.9 billion in FY 2012, an amount that is higher than all other spending on criminal Federal law enforcement agencies (Meissner et al. 2013). Workplace enforcement, which could alleviate some of the fiscal burdens of border enforcement, has not kept pace. Effective workplace enforcement would entail enabling employers to quickly and accurately verify employees' eligibility by using an electronic employment verification system (E-Verify), and also holding those employers accountable who deliberately break the law by hiring unauthorized workers or violating labor laws.

The Department of Homeland Security estimates that of the 11.5 million unauthorized immigrant population residing in the United States in 2011, approximately 1.3 million were under 18 years of age (Hoefer, Rytina, and Baker 2012). Undocumented young people who were brought to the country as children have no clear path to future legal status that would enable them to further their education and find gainful employment outside of the shadow economy. Various versions of legislation to address the undocumented student population, often referred to as the DREAM Act, have been introduced in recent congressional sessions. The latest effort in 2010 passed the House but failed to pass the Senate. In June 2012, the Secretary of Homeland Security announced and implemented a new process, known as “Deferred Action for Childhood Arrivals,” which provides work-status eligibility and relief from deportation for unauthorized immigrants who are no more than 30 years old and who arrived in the United States before age 16. While a smaller number are currently eligible to petition, up to 1.7 million young people could potentially benefit from this program once they reach the requisite age (Passel and Lopez 2012).

Foreign-born workers in the United States tend to be concentrated at both the low and the high end of the educational spectrum. Table 4-4 shows that 29.1 percent of the foreign-born have less than a high school degree. On the other hand, 10.9 percent have a master’s degree or higher, a share on a par with that of the native-born. The table also shows that the foreign-born are more likely to be of working age, with 67.2 percent of the foreign-born aged 25–54 years old compared with 55.9 percent of the native population. The table also shows that foreign-born men are much more likely to be employed than native-born men.

Other countries that receive large numbers of immigrants, such as Australia and Canada, admit a majority of their immigrants based on employment skills. Australian work visas are most commonly granted to highly skilled workers. Candidates are assessed against a system that grants points for certain standards of education. In Canada, almost two-thirds of visas are issued to economic immigrants, primarily skilled workers and their dependents. Skilled workers are selected on factors such as education, English or French language abilities, and work experience. In contrast, the United States has a more “outcome”-based approach to granting visas. For example, employment visas are awarded to persons with extraordinary ability (EB-1), outstanding professors and researchers (EB-2), and skilled and unskilled workers with job offers from a U.S. employer (EB-3). While

Table 4-4
Distribution of Education, Age, and Employment
For Natives and Foreign Born Individuals, 2010–2012

	Native	Foreign Born
<i>Education Attainment (Age 25+)</i>		
Less than high school	9.3	29.1
High school, no college	31.7	26.0
Some college or associates	28.2	16.2
Bachelor’s	19.9	17.8
Master’s or higher	10.9	10.9
<i>Age Group</i>		
16-19	0.6	0.3
19-24	6.9	5.0
25-54	55.9	67.2
55-64	17.5	13.6
65+	19.1	13.9
<i>Work Status</i>		
Employed	60.3	62.4
Men	64.7	73.8
Women	56.2	51.2

Note: Sample limited to individuals 16 and over who are not enrolled in school.

Source: Bureau of Labor Statistics, Current Population Survey, Annual Social and Economic Supplement; CEA calculations.

some may argue that Canada and Australia might do a better job of attracting skilled immigrants than the United States because of their point-based systems, a recent study using detailed data compares the United States with Australia and finds that, by and large, the two countries attract similar immigrants. Skill premiums and geographic proximity, rather than the specific details of the admission criteria, play the predominant role in determining the quality of employment-based immigrants (Jasso and Rosenzweig 2008).

Since enactment of the Immigration and Nationality Act of 1965, family reunification has been a cornerstone of U.S. immigration policy. Debate continues on whether the United States should maintain this family-based system or move more toward an occupation- and skills-based system. While the question is often posed as a stark choice between two systems, in reality the two visa categories—family and employment—complement each other in important ways. In choosing a country to move to, skilled prospective immigrants envision a better life not only for themselves but for their families. Using data arranged by year of arrival and country of origin, one study found a positive correlation between the fraction of immigrants arriving on sibling preference and mean education levels of the immigrants. The data seem to support the notion that highly educated immigrants who arrive based on employment and occupational preference categories then sponsor their siblings who are also highly educated (Duleep and Regets 1996). As proposals are made to increase skill-based immigration, it is important to keep in mind that a welcoming policy toward the family is an important factor in attracting skilled workers to live and invest in the United States.

The Economic Benefits of Immigration

Conventional theory suggests that the destination country as a whole gains from immigration, though these gains may be uneven across groups. Immigrants add to the labor force and increase the economy's total output. The gains accrue to natives whose productivity is enhanced by immigrant workers—often referred to as complementary factors—as well as to capital owners. A major study published by the National Research Council in 1997 estimated the size of the “immigrant surplus” to be on the order of \$14 billion in 1996 dollars, or 0.2 percent of GDP. Given the size of today's economy, this translates into \$31.4 billion in 2012 dollars, even without accounting for growth in the share of the population that is foreign born.

There are additional reasons to think the above calculations may understate the full economic benefit of immigration. For one, the calculations do not take into account the fact that capital owners may boost investment in response to the increased number of workers, which may induce further economic growth. For another, the simple approach assumes a

negative impact on the average wages of native workers that has been difficult to establish empirically. The same National Research Council study concluded that the body of empirical evidence pointed to a very small negative impact from immigration on wages of competing native workers—on the order of 1–2 percent and often statistically insignificant.⁵ In fact, to the extent that new immigrants crowd out existing workers, research shows that those most adversely affected are recent immigrants (Lalonde and Topel 1991; Ottaviano and Peri 2012). A new immigrant with limited English skills, for example, will likely compete closely with other recent immigrants with poor English ability in jobs that do not require institutional, technical, or advanced language skills, thereby lowering the recent immigrants' wages.

Recent studies suggest, in fact, that the skills and talents that immigrants and natives bring to the labor market may not be substitutes for each other. Low-skilled immigrants may enhance the productivity of high-skilled natives. Even within skill groups, the various talents that immigrants and native workers bring to the labor market may complement each other rather than compete. The intuition behind the gains to both natives and immigrants in this case would follow from the principle of comparative advantage. For example, an immigrant worker may be an extraordinary computer programmer but have limited English skills. Rather than filling the programming job with a native worker who is not as skilled in this particular task, the employer might assign the native worker to tasks that use communication and English language skills. Some of these ideas are pursued in recent work by Giovanni Peri and co-authors (Peri and Sparber 2009; Ottaviano and Peri 2012). Other research also by Giovanni Peri compares states with differing levels of immigration and finds that immigration raises productivity by promoting efficient task specialization (Peri 2012).

Another question regards the impact of immigration on the public finances of the host country. Immigrants contribute positively to government finances by paying taxes but add to costs by using publicly provided goods and services such as roads, police, and schools. The 1997 National Research Council study estimated that, over the long run, a typical immigrant and his or her descendants would contribute about \$80,000 more in taxes (in 1996 dollars) than they would receive in terms of public goods and services. This would translate into nearly \$120,000 in 2012 dollars. This positive fiscal impact is attributable to several factors: most immigrants arrive at young ages; their descendants are expected to have higher incomes; immigrants help to pay for public goods such as national defense that do not entail congestion costs; and the 1996 Personal Responsibility and Work

⁵ NRC (1997), chapter 5. Also see Card (1990), Friedberg and Hunt (1995), Card (2009), Cortes (2008). See Borjas (2003) and Borjas, Grogger, and Hanson (2011) for the opposing view.

Opportunity Reconciliation Act prohibited new immigrants from receiving public benefits for five years after arrival.

A recent Congressional Budget Office study also found that allowing undocumented immigrants a pathway to citizenship is likely to help the Federal budget. The study estimates that, had a pathway been established, Federal revenues would have increased by \$48.3 billion while Federal outlays would have increased by \$22.7 billion over the 2008–12 period, leading to a surplus of \$25.6 billion. The revenue increase stems largely from greater receipts of Social Security payroll taxes, while the increase in outlays would be in the form of refundable income tax credits and Medicaid. This calculation does not take into account possible increases in Federal discretionary spending. There may be also additional expenditures at the State and local level on education and healthcare, which are harder to forecast (CBO 2007).

Another important economic benefit of providing a pathway to earned citizenship is that, by bringing immigrant workers out of the shadows, they will be able to obtain above-ground jobs, advance in their careers, and contribute more fully to the economy. Moreover, with a pathway to earned citizenship, immigrant workers and their employers will invest more in their skills, raising the benefit to the economy even further. Legalizing this population will also benefit U.S.-born citizens as they need no longer compete with workers who may work at below market wages due to their unauthorized status.

A Magnet for High-Skilled Immigration

A growing area of study is how high-skilled immigrants—particularly those in the STEM fields—contribute to innovation and growth. Based on the 2010 National Survey of College Graduates conducted by the National Science Foundation, immigrants represent 13.6 percent of all employed college graduates, but they account for 50 percent of PhDs working in math and computer science occupations, and 57.3 percent of PhDs in engineering occupations (Table 4-5). About two-thirds of these foreign-born PhDs hold U.S. degrees, suggesting that many of them either immigrated as children or came to attend U.S. universities and stayed.

Interestingly, one study found that 26 percent of all U.S.-based Nobel laureates over the past 50 years were foreign born. The same study also found that in the EU-12 countries, immigrants made up slightly less than 5 percent of total population and accounted for about 4 percent of those holding masters' and PhDs, in contrast to the United States (Wasmer et al. 2007).⁶

⁶ According to the study, the data for Nobel Laureates were found at the official website of the Nobel Foundation: <http://nobelprize.org/nobel/>.

Table 4-5
 Percentage of Foreign-Born College Graduates
 by Degree and Occupation, 2010

	All	Bachelor's	Master's	Professional	Doctorate
Total	13.6	11.8	15.3	12.9	32.2
<i>All sciences</i>	28.6	20.3	38.1	50.7	44.2
Math/computer sciences	29.2	21.8	42.4	30.5	50.0
Life and related sciences	28.8	14.5	27.3	59.4	44.2
Physical and related sciences	23.9	12.2	21.3	49.6	38.8
<i>Engineering</i>	24.1	16.2	33.3	44.4	57.3

Note: Occupation refers to occupation for principal job. Sample limited to employed individuals.

Source: National Science Foundation/National Center for Science and Engineering Statistics, National Survey of College Graduates (2010).

These statistics support the view that the United States continues to be a magnet for highly skilled immigrants. Two factors likely play a role. First, the United States has flexible labor markets that are able to integrate immigrants relatively quickly. Second, the skill premium is high in the United States, and individuals with exceptional ability and willingness to work hard can thrive. These factors have enabled the Nation to benefit from large inflows of highly skilled workers.

Boosting Innovation and Entrepreneurship

In addition to the benefits already covered, recent studies have shown that immigrants promote productivity and innovation, directly and also indirectly through positive spillover effects on native researchers and scientists. Gauthier-Loiselle and Hunt (2010) found that immigrants patent at two to three times the rate of U.S.-born citizens. The study also found that immigrants further boost innovation in the economy by having positive spillovers on the native rate of innovation. Another study found that raising the number of skilled information-technology workers—as has been done by raising the cap on H-1B visas—spurs innovative activity in states that more heavily employ these workers (Kerr and Lincoln 2009).

Studies also have found that immigrants are not only exceptional workers and innovators but also highly entrepreneurial. One study found that 25 percent of venture capital companies between 1991 and 2006 were started by immigrants (Anderson and Platzer 2006). Another found that immigrants started 25 percent of engineering and technology companies founded between 1995 and 2005 (Wadhwa et al. 2007). Even outside the high-tech sector, one study found that immigrants are more likely than natives to start a company with more than 10 workers (Fairlie 2012). Immigrants are 30 percent more likely to form new businesses than U.S.-born citizens. A study by

Partnership for a New American Economy found that more than 40 percent of Fortune 500 companies were founded by immigrants or their children. The study also found that these companies are responsible for many jobs here and abroad—employing more than 10 million people worldwide—and that they generate annual revenues of \$4.2 trillion.

While there is clearly room for further study, these studies generally provide little systematic evidence that increases in the supply of foreign scientists and engineers discourage natives from entering these fields or from engaging in innovative activity. For example, Gauthier-Loiselle and Hunt found that the inflow of high-skilled immigrant science and engineering workers into a state did not decrease the number of patents originated by native science and engineering workers in the state. Borjas (2007) also found that, on the whole, rising enrollment of foreign graduate students did not discourage native enrollment in science and engineering programs, although there were some disparate impacts across groups.

President Obama has supported a recent initiative to graduate 1 million more college graduates with STEM degrees. At the same time, all evidence points to the fact the United States is extraordinarily successful at attracting highly skilled workers from other countries. Sensible immigration policy would entail taking advantage of this unique situation and allowing more high-skilled immigration. The lack of clear evidence of crowding out bolsters confidence that these are not two conflicting policy goals.

Conclusion

With slowing population growth and aging of the workforce, America needs more workers. The Nation also needs to invest in the education, skills, and training of its citizens so they can fill the jobs of the future. Over the past four years, President Obama has taken an aggressive stance toward combating the rising cost of college. The expansion of the Federal Pell Grant program and the American Opportunity Tax Credit has made college more affordable for millions of students and families. Challenges still remain, including the continuing rise of tuition and levels of student debt. In his recent State of the Union address, President Obama called upon colleges to join in the effort to keep costs down. He proposed using metrics such as value, affordability, and student outcomes in distributing Federal campus-based aid. He also announced a new Race to the Top program for College Affordability and Completion, which will reward states who are willing to change their higher education policies and practices to contain tuition costs and ease students' progress toward a college degree.

With the potential to address both the need for workers and the need for skills, the gains from commonsense immigration reform loom large.

Immigration can boost the economy by adding workers and making our labor force younger and more dynamic. Offering a path to citizenship to more than 11 million currently undocumented residents will further expand the economy as this group invests in education, finds gainful employment, and pays taxes. Border enforcement has proven to be effective, but it is a drain on our public finances. Smart enforcement that balances border security with crackdowns on worksite fraud will not only have higher returns going forward, but it will also save taxpayers money. America has historically been a magnet for capable and hard-working immigrants who seek opportunities and a better life. Many of these immigrants are innovators and entrepreneurs. The smart policy ahead is to leverage America's unique advantage for future prosperity and growth.

Smart policy also involves making sure that all Americans benefit from economic growth. In his 2013 State of the Union address, President Obama reiterated his commitment that an honest day's work is rewarded with decent pay, enough to feel secure and support a family. A Federal minimum wage that keeps up with the cost of living, policies that strengthen workers' ability to bargain for decent wages and safe working conditions, and tax policies such as refundable credits that allow lower-income families to invest in their children's education, are important pieces of the foundation upon which an economy that works for the middle class is built.

