Center for American Progress

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The Contributions of Immigrants and Their Children to the American Workforce and Jobs of the Future

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Introduction and summary

Our nation is in the middle of two great demographic shifts. The largest generation of Americans—the Baby Boomers—is reaching retirement age and will leave the workforce en masse between 2010 and 2030. The retirement of the Baby Boom generation will create millions of replacement job openings, even as economic growth creates the need for additional workers to fill newly created jobs. At the same time, our nation is becoming more demographically diverse. Immigrants and their children make up a growing share of the population that will be entering their prime working years over the next two decades.

With large numbers of jobs coming open in every sector of the economy and at all skill levels from now to 2030, immigrants and their children will be critical to the continued dynamism of the American workforce and economy. They will play a vital role in reshaping the workforce, filling essential jobs, and sustaining economic growth.

This report analyzes fundamental demographic and employment trends that are changing our nation's workforce and seem certain to continue long beyond the ongoing recovery from the recent deep recession.[1] The workforce and jobs of the future will be very different from those of today.

This study presents projections of the workforce that are unprecedented in their detail about the role of foreign-born immigrants—the first generation—and their native-born children—the second generation. Grounded in data from the Census Bureau and the Bureau of Labor Statistics, or BLS, the uniquely detailed Pitkin-Myers generational projections of population[2] are extended to estimate the role of immigrant generations in the workforce.

The study combines these projections of the size and characteristics of the workforce with independent estimates of job openings to show the linkages between workforce changes and economic growth over the coming decade and beyond.

We begin by comparing the coming wave of Baby Boomer retirements with the growth of the workforce—that is, the sheer numbers of people leaving and enter-

Definitions

Workforce: The workforce comprises everyone in the population ages 16 and older who is employed outside of the armed forces, as well as those unemployed people who are actively seeking work. The labor force is another term for workforce and is used interchangeably.

Job openings: Job openings result from growth of jobs and the need to replace workers who leave the workforce (through retirement, death, or other reasons) or who change occupations.

ing the workforce and available to fill jobs in the future. We project that over the next two decades, nearly 83 million people will enter the workforce. More than two-thirds of all new entrants to the workforce will be needed to replace today's workers, who will retire and leave the workforce, with the remaining entrants accounting for the growth in the workforce.[3]

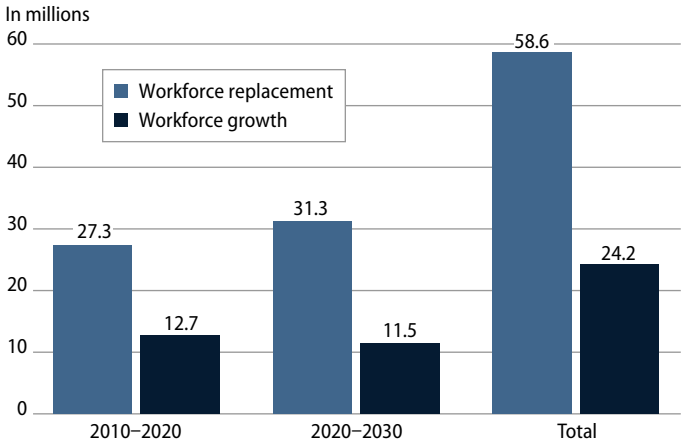
Baby Boomer retirements and the future workforce

People born between 1946 and 1964, the so-called Baby Boomers, were by far the largest cohort in American history. This large generation currently comprises more than 38 percent of the total workforce. This year the first of the Baby Boomers turns 67 years old, past the threshold of eligibility for full Social Security benefits. Even while many are delaying retirement to stay in the workforce at later ages, most will retire in the next 20 years. Between 2010 and 2030 some 45 million older workers will retire, of which 40 million are members of this large generation.

As these retirees and others[4] leave the workforce, new workers will be required to replace them—just to maintain current outputs of goods and services. Between 2010 and 2020, 27.3 million workers will leave the workforce, and between 2020 and 2030 another 31.3 million will leave. In total, these 58.6 million of the 83 million new workers projected to enter the labor force during the next two decades, more than two-thirds of all new workers, will be replacements for older workers leaving the workforce. (see Figure A)

FIGURE A

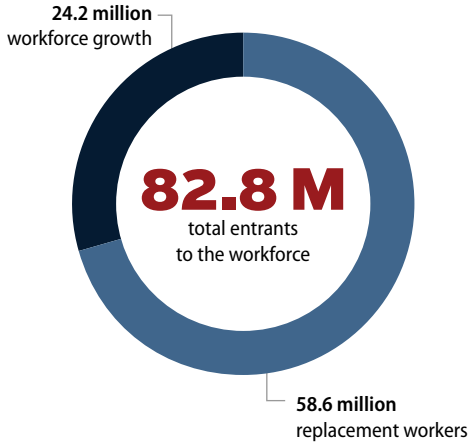
Future workforce



Source: Summary of authors' calculations.

FIGURE B

Total entrants to workforce, 2010 to 2030



Source: Summary of authors' calculations.

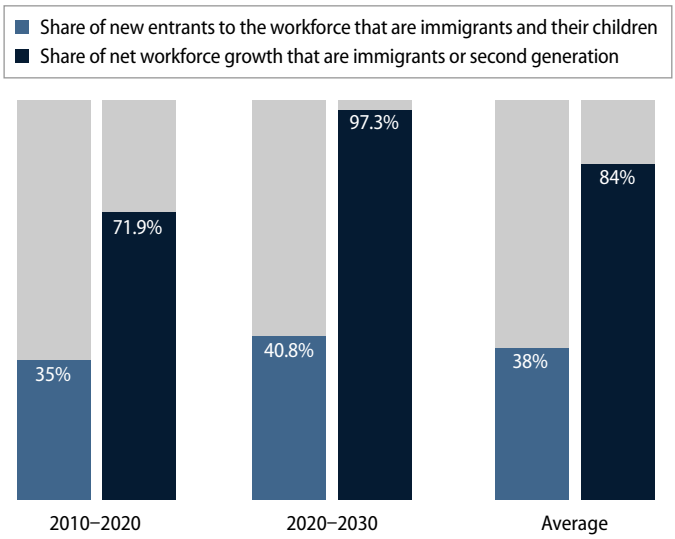
Between 2010 and 2020 the workforce will grow by 12.7 million people, and between 2020 and 2030 it will grow by an additional 11.5 million, for a total of 24.2 million people. (see Figure A) In total, over the next two decades, nearly 83 million people will enter the workforce. More than two-thirds of them will replace people currently in the workforce, and the rest will account for the growth in the workforce. (see Figure B)

Where will the close to 83 million new workers come from? There are three streams of new entrants to the workforce: 51.3 million grown children of native-born parents today (third-generation or higher Americans); 18.6 million immigrants (first-generation Americans); and 12.9 million grown children of immigrants (second-generation Americans). Hence, 31.5 million of the 83 million new workers, or 38 percent, will be immigrants and their children. (see Figure C)

Although immigrants and their children, *the first and second generations*, will comprise 38 percent of new workers, they will be a much smaller share of those aging out of the workforce. As a result, this group will account for the large majority of the net increase in the workforce and fill many of the future job openings that will be created as the Baby Boom generation retires from the workforce. Taken together, immigrants and their children will account for 85 percent of net workforce growth over the next two decades. (see Figure C) Between 2010 and 2020 immigrants and their children will make up 72 percent of net workforce growth; between 2020 and 2030 they will make up 97 percent—nearly all of the workforce growth.

FIGURE C

Immigrants and their children (second generation) in the future workforce



Source: Summary of authors' calculations.

Job openings in the future

Our projections of the overall workforce tell one side of the story of jobs in the economy: the number and characteristics of people available to work in the United States. How do these compare with expected job openings?

It is reasonable to expect that there will be about 90 million job openings between 2010 and 2030, roughly two-thirds of which will be replacement jobs and one-third of which will be new jobs. These jobs will be filled largely by the new workers and by reductions in the ranks of the unemployed. Just as immigrants and their children will play a critical role in the growth of the workforce, so too will they be essential to meeting the job needs of the future in different occupations.

The replacement jobs that the Baby Boomers will leave behind and the new jobs will be in all sectors of the economy and at all skill levels. Some of the highest concentrations of jobs will be found in occupations such as professional and technical work (12.3 million by 2020), the service sector (12.6 million by 2020), and office and administrative support (7.4 million by 2020).

Other professions requiring workers with various skill levels will also see great needs in the future, including sales (6.5 million by 2020), installation and repairs (2 million by 2020), and transportation and material moving (3.6 million by 2020).[5]

And while in the future there will be more jobs that require higher levels of education, data from the Bureau of Labor Statistics indicate that job growth will occur for workers at all educational and experience levels, from those without a high school degree to doctoral degree holders.

The 25.6 million foreign-born workers in the U.S. workforce as of 2010 already make up 16.6 percent of the total workforce. These workers can be found in every major occupational sector, including more than one in eight workers in agriculture, construction, production, service, professional, and sales occupations.[6] The widespread prevalence of the Baby Boomer workers across occupations and industries suggests that their immigrant and children replacements will have even more important roles in coming decades than today.

Summary of findings

This report shows how central immigrants and their children will be to meeting the future workforce and economic needs of the nation. Several specific findings are offered about immigrant contributions to the future workforce. These are followed by some general conclusions related to current policy debates. The five principal findings of this study are the following.

Impact of Baby Boomer retirements

We project that 58.6 million workforce replacements between 2010 and 2030 will be required by the retirement or death of Baby Boomers and other older Americans. This is more than 80 percent greater than the number of replacements required by the exit of the previous generation between 1990 and 2010. The accelerating wave of retirements by the Baby Boom generation provides a key context for judging the economic importance of immigrants and their U.S.-born children.[7]

Most new workers will replace those exiting the workforce

Our projections show that fully two-thirds (58.6 million) of all new workers will replace people who will leave the workforce, while one-third (24.2 million) will represent growth.

Immigrants and their children are vital to replenishing the workforce

Without the immigrant population, the nation's workforce would not be sufficient to replace the number of workers expected to retire from the labor force between 2010 and 2030. Our projections indicate that 51.3 million workers who are native born and not of immigrant parents are likely to enter the workforce in this period. That number is 7.3 million people short of the total number of workers that will be leaving the workforce.

Labor-force growth will support economic growth

Just to maintain current production of goods and services, large needs for replacement workers are projected in the major occupations where members of the retiring generation of Baby Boomers are currently employed. In addition, economic growth is sustained by more than just replacement of retiring workers. Our projections that include immigrants and their children indicate a total increase in the workforce of 24 million workers by 2030.

Retirements will raise the need for new skilled workers

The nation will need a growing number of experienced workers at all skill levels due to the number of older workers that are being replaced. Because the Baby Boomers are more highly educated than earlier generations, replacement needs at higher skill levels will accelerate. This is a substantial shift from the situation before 2010, when a much larger share of older workers leaving the workforce had less than a high school education.

Finally, we believe our empirical findings carry some general implications for current debates over comprehensive immigration reform. Overall, our findings show that existing immigrant residents, their children, and new arrivals are indispensable additions to the nation's workforce, making important contributions that should be studied and carefully considered by policymakers.

Among the policy implications that follow from our findings are the following.

Our projections could be curtailed by policy

The strong growth in the workforce that we project could be reduced if insufficient numbers of new immigrant admissions are permitted. Our workforce projections are based on an extension of current trends in delayed retirements of older workers and assume a rebound in new immigrant arrivals from current low levels. Should the flow of immigrants be restricted below our projected levels, that would have the effect of making it more difficult to replace retiring workers, and it would reduce the growth in the workforce for future economic growth.

More efficient management of the immigration flow is needed

All levels of skills are likely to be needed in the future, necessitating a legal immigration system that is flexible and adjusts to the changing needs of the nation's workforce and economy. Our immigration policies, for example, should facilitate the process for international students who we have trained in our colleges and universities—and who have acquired expertise in skills needed by our economy—to receive legal residency so that they become part of the next round of new immigrants joining the workforce.

The legal and citizenship status of immigrants are workforce issues

Although our study has not addressed the legal status of current and future immigrant workers, it is noted that a substantial minority of immigrant workers have unauthorized residence and face limitations on their skill development and working conditions. These workers' future contributions to meeting the nation's workforce needs will be affected by whether or not immigration reform changes the legal status of this population.

Beyond the important consideration of how to reform our immigration laws, policymakers must not neglect native-born citizens. They, similar to immigrants and their children, will also be filling many of the positions now held by Baby Boomers. Skill development for the entire workforce should be a priority. The urgency of our needs in this decade and the next requires that the generational transition in the workforce that has already begun should not be left to happenstance.

Section 1: Overview

Nearly 83 million new workers are projected by this study to enter the labor force between 2010 and 2030, filling new jobs created by economic growth and replacing the large numbers of Baby Boomers who will be retiring. The skills and abilities of these workers will contribute to economic growth and help sustain the nation's future economic prosperity. Immigrants now comprise some 16 percent of the workforce, and it is widely recognized that they can help fill the jobs that will be left by retiring Baby Boomers and also be an important source of economic growth.[8]

The present study seeks to estimate just how large a role immigrants and their children will play in meeting the nation's future workforce needs. It aims to provide a fuller and much more detailed projection of immigrants in the workforce than has been previously attained. The analysis is guided by the generational approach of demographic analysis for policy purposes, whose touchstone is the book *Immigrants and Boomers* that described generational transition in America from 1970 to 2030 as the life-cycle advancement of aging Baby Boomers and the incorporation of newer immigrant generations. [9]

The research objectives

In this report, we seek to quantify the basic contours of immigrant contributions to a changing labor force over the next two decades. While we recognize that there is a serious immediate unemployment problem and a need for policies to address it, this paper focuses on jobs and workforce trends over the next two decades, during which the current high unemployment rate is projected to be reduced.[10] The long-term trends merit consideration in the debate about immigration reform now being considered by Congress. Specific questions to be addressed include:

- How much will the workforce grow between 2010 and 2030?

- How many workers will leave the workforce and need to be replaced?

- How many new workers are expected to enter the workforce, either from children coming of age, from increases in participation effort by existing adults, or from newly arrived immigrants?

- What will be the characteristics of the new entrants compared to those leaving the workforce in terms of age, new immigrants, the children of immigrants, and other native-born workers?

- What will be the immigrant contribution to workforce change?

- How are occupational needs growing and changing, both in respect to total job growth and replacement job openings and in respect to skill and experience requirements?

Meeting new information requirements

The present study brings to bear substantial new information not currently provided by the federal data system. The greatest impediment to a full accounting of the role of immigrants and their children in the future workforce has been the absence of population projections that disaggregate the U.S. population by nativity (foreign born versus native born), which are essential for creating labor-force projections. Census Bureau projections of the population have provided only limited information about the foreign-born population. The latest projections from December 2012, with supplements in May 2013, do not distinguish immigrant and native-born components of the population, nor are the children of immigrants distinguished from others who were U.S. born.[11]

The absence of population projections with immigrant detail has prevented the Bureau of Labor Statistics from incorporating an explicit immigrant dimension into their otherwise excellent studies of labor-force trends. As a result, immigrants are intermixed with native born in unknown proportions within each of the major race-ethnic groupings of the workforce. Over time immigrants may become a larger or smaller portion of different groups, altering the trends in unmeasured ways with unknown implications for the future. Information on these trends is clearly to be desired, especially at a time when immigration reform and the role of immigrants in meeting the nation's workforce needs are on the national agenda.

Better accounting of future labor-force trends therefore requires, first, a projec-

tion of the immigrant population likely to reside in the United States, including not only the present foreign-born population aged forward in time but also the children of immigrants (the second generation), and the anticipated new arrivals. The latter are more uncertain because they are subject to changes in immigration policy. Past trends in new arrivals and expert opinion about future changes are the best guide to possible future flows.

A second component necessary for projecting immigrant workers is the rate of labor-force participation by people of foreign origin. This rate often differs from the rates for those who are native born and of the same gender and race or Hispanic origin. While these data are collected in the Current Population Survey, or CPS, and the American Community Survey, or ACS, the data differ between the two data sources, and they are compiled in an inconsistent manner. Moreover, changes in definitions and procedures over recent years make it difficult to assemble the consistent time series needed for trend projections.

The present study makes use of population projections prepared for the United States by John Pitkin and Dowell Myers in 2011 and revised in 2013 with updated assumptions.[12] These projections break out the population by foreign-born or native-born status, as well as by status as children of foreign-born mothers (second generation), or as third-generation or later members of the population. To accompany the more detailed categories in this generational population projection, we have prepared a corresponding set of labor-force participation rates tabulated and averaged from CPS monthly surveys and projected forward to the future by following recent BLS projections. Details are supplied in the technical appendix.

Section 2: Size, make up, and change in the workforce

A short overview of the workforce and its dynamics of change help lay the foundation for what follows. The workforce consists of all the people who are either currently employed or looking for work. By convention, this is limited to people ages 16 and older, and we further follow the convention of the Bureau of Labor Statistics in restricting analysis to the civilian population not living in institutional quarters. The initial overview of the workforce offered here emphasizes its generational structure, both in terms of age and immigrant origins. Subsequent sections will then delve into the dynamics of change and explain how we are able to project the changes described in this report.

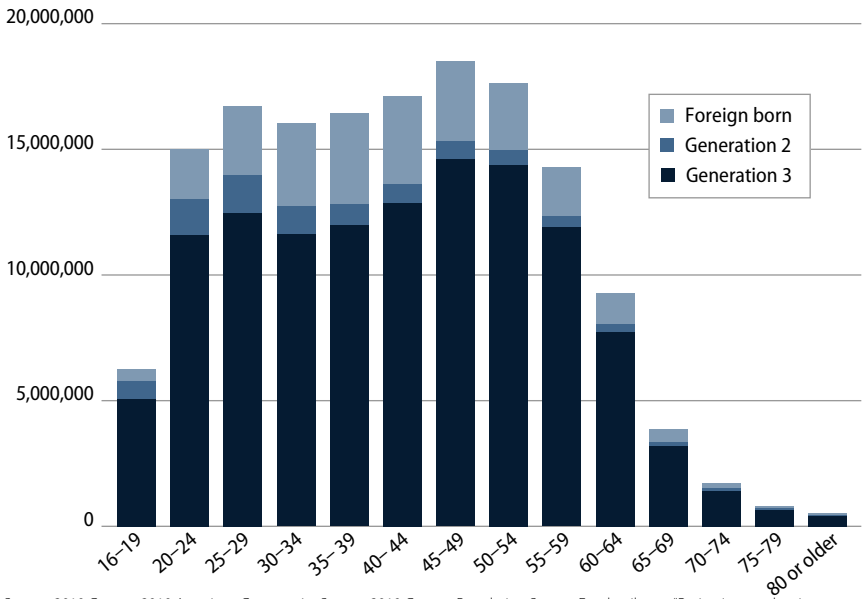
The structure of the workforce

An overall profile of the workforce in 2010 is given in Exhibit 1, showing the age groups and the portion that is foreign born, the native-born children of immigrant mothers (second generation), or the native-born grandchildren (or higher generations) of immigrant ancestors.

There are at least 16 million workers in each of the five-year age groups from age 25 to age 54. The largest age groups in 2010 are ages 45 to 49 and ages 50 to 54, containing workers from the heart of the Baby

EXHIBIT 1

2010 workforce by immigrant generation



Source: 2010 Census; 2010 American Community Survey; 2010 Current Population Survey. For details, see "Projections and estimates of the workforce" in the technical appendix.

Boom generation. The sharp drop-off in numbers at older ages reflects both the smaller cohort size of earlier generations and also attrition due to retirement or death at older ages.

Also shown in Exhibit 1 is the portion of the workforce supplied by immigrants and their children. The U.S. workforce in 2010 contains 25.6 million foreign-born workers, who amount to 16.6 percent of the total. In addition, there are 8.7 million U.S.-born children of immigrant mothers, or 5.7 percent of the total workforce. The largest numbers that are of immigrant origin are visible in Exhibit 1 at ages 30 to 49, amounting to more than 3.2 million workers in each five-year age group. The smaller number of foreign-born workers at ages 20 to 29 reflects both the slowdown of immigration in the 2000s and the absence of those workers in the cohort who will immigrate after age 30. The U.S.-born children of immigrants are most prominent in the younger age groups, typically some 20 to 30 years younger than their parents and account for a total of more than 4 million workers age 20 to 34.

Overall, immigrants and their children form a large share of the workforce at certain ages. In the youngest age group, the second generation approaches 10 percent of all workers, while at ages 30 to 44, the immigrant generation accounts for at least 20 percent of workers of that age. As shown in more detailed analysis in later sections, immigrants and their children contribute an increasing share of the net growth in the workforce over time.

Basic metabolism of retirement and replacement

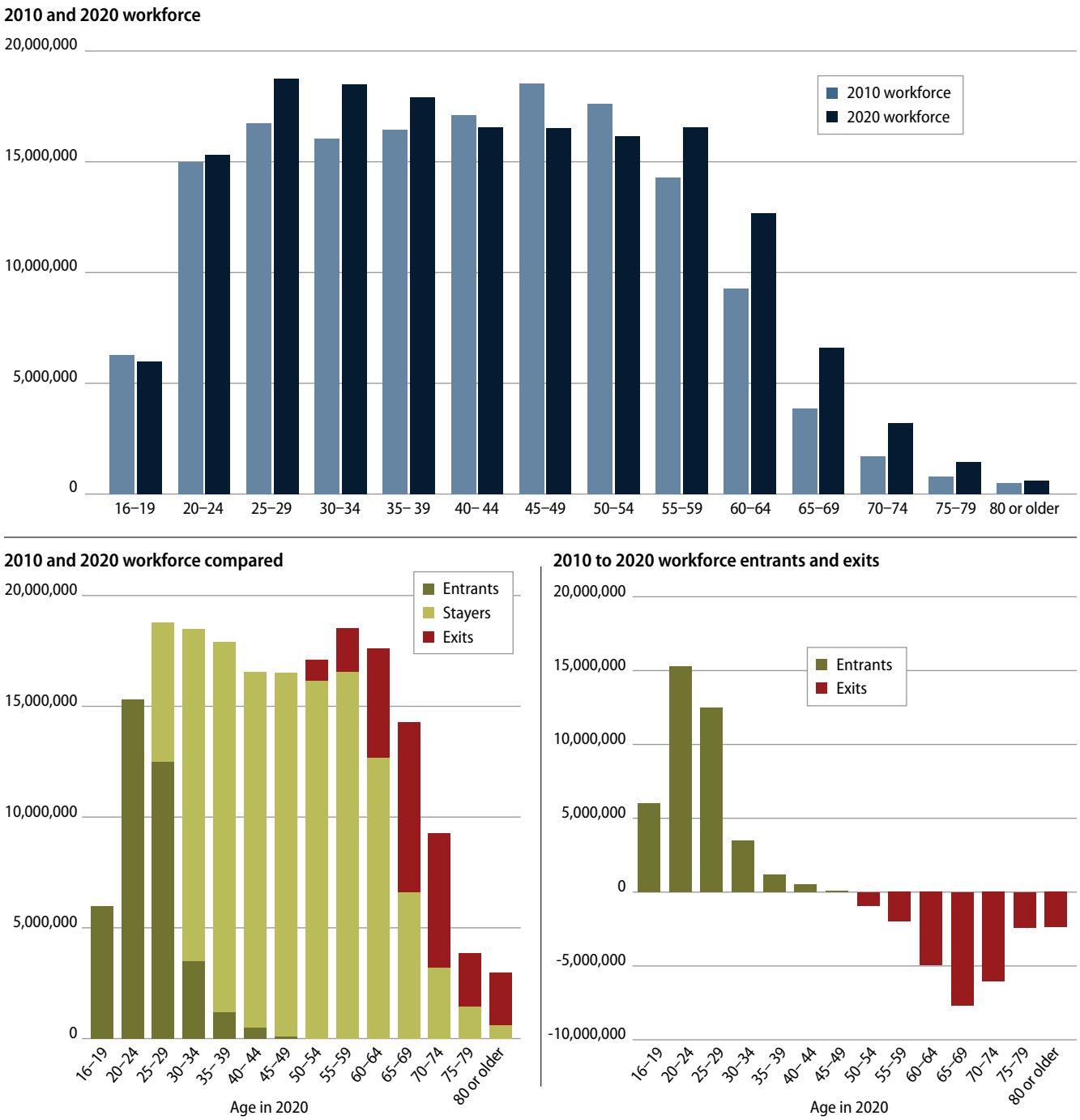
In the current decade the workforce is projected to grow by 12.7 million people, or 8.3 percent, which is less than 1 percent per year and slow by historical standards. In the next decade between 2020 and 2030, the workforce is projected to grow even more slowly, by 11.5 million people, or 6.9 percent. But beneath the surface is much more dynamic change. In addition to the overall growth is a substantial rotation of the composition of the workforce. Some 27.3 million workers are projected to exit the workforce this decade, entering retirement or leaving the workforce due to disability, death, or other reasons. They will be replaced by 40 million people who will enter the workforce at younger ages. Similarly, 31.3 million workers are projected to leave the workforce during the decade between 2020 and 2030. They will be replaced by 42.8 million new entrants. As shown in later sections of this report, the same basic metabolism is at work in all decades, but the volume of exits and entries is rising over time..

It is the difference between these exits and entries that yields the net growth in workers, and the rotation of more than 67 million workers (the sum of exits and entries) is involved in producing the net growth of 12.7 million workers in the next decade. Likewise, the exit and entry of more than 74 million workers during the decade from 2020 to 2030 produces the projected net growth of 11.5 million workers. A graphic depiction of these movements for the decade of 2010 to 2020 is shown in Exhibit 2.

The 2010 and 2020 workforces are displayed by age group. Over the decade everyone grows 10 years older, so all workers shift 10 years to the right. By the end of the decade, retirements and other exits from the workforce have depleted the number of workers in older cohorts compared to their number in 2010, when they were ten years younger. That loss of 27.3 million workers is colored red. Conversely, new cohorts have aged into workforce years, and their arrival is colored green, representing the 40 million new workers. This pattern of older workers leaving the workforce to be replaced by younger entrants is important for both workforce and immigration policy and will be discussed later in this report.

EXHIBIT 2

Calculations of 2010 to 2020 entries and exits by age, based on the workforce in 2010 and 2020, total population



Source: 2010: See "Projections and estimates of the workforce" in the technical appendix. 2020: Pitkin-Myers workforce projections.

Section 3: Labor-force participation rates

The rate of participating in the labor force is measured as the proportion of individuals who either hold a job or are currently looking for employment. These rates of labor-force participation, or LFPRs, are systematically different for groups defined by gender, age, and race/ethnicity, and together with the size and composition of the population determine the size of the workforce. They also vary between immigrants and native-born members of the aforementioned groups. To a much lesser degree, LFPRs also differ between second generation and other native born.

In this section, we describe the historic and projected rates of participation in the labor force.[13] The past rates are derived from the Current Population Survey, or CPS. The projected future rates for ages 55 and older are from Toossi (2009) and for younger ages are held constant at observed 2010 levels. We also have broken out separate immigrant and native-born components within each age-sex-race segment. The rates used in this analysis are therefore at once modified and more detailed than those used by the Bureau of Labor Statistics for their projections. We then apply these more detailed LFPRs to the revised Pitkin-Myers 2011 U.S. generational population projections to project the size and detailed demographic characteristics of the workforce.

Age and gender differences in rates of labor-force participation

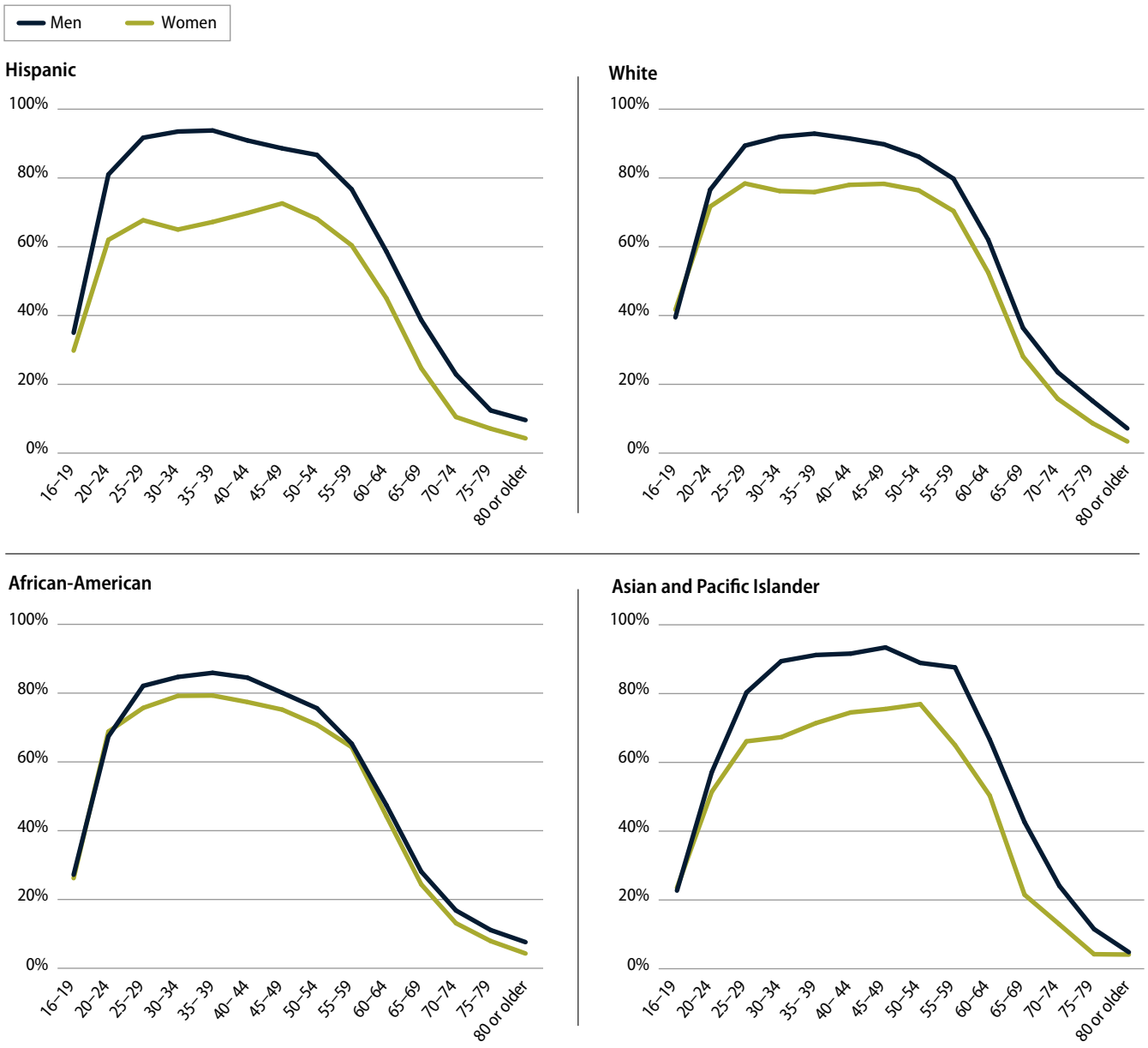
The greatest systematic differences in labor-force participation are by age, with rapid rises in the LFPR after age 20, plateauing by age 30, drifting downward after age 50, with rapid descent for those older than age 60. This descent reflects exits from the workforce most of which represent retirement. Age differences will be displayed in every graph that follows.

Gender differences are greater for some race/ethnic groups than others. (see Exhibit 3) Among African Americans there is only a small difference between men and women because both have very high participation rates. In contrast, Latino

men have the highest participation rates of any race or ethnicity, while Hispanic women have the lowest. As a result, the largest gender gap in participation rates is found among Hispanics. The second-widest gender gap is found among Asians and Pacific Islanders, while the second smallest is among white non-Hispanics.

EXHIBIT 3

Labor-force participation rates in 2010 by age, gender, and race/ethnicity



Source: Current Population Survey. 2010.

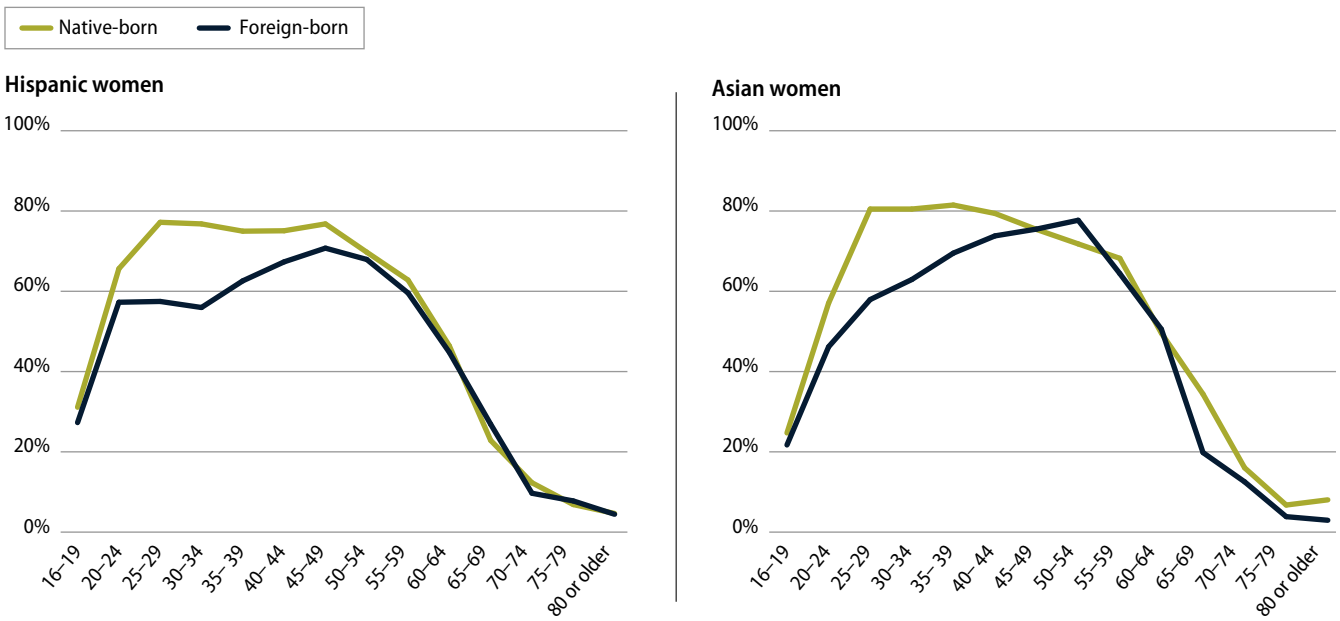
Nativity differences in rates of labor-force participation

The lower participation rates found among Hispanics and Asians may be due to the larger share who are foreign born. We examine how much lower the LFPR is for immigrant women of the same ethnicity in Exhibit 4. Among both Hispanics and Asians, foreign born women in their late 20s and early 30s have participation rates that are nearly 20 percentage points lower than the rates for native born women of the same origin and race. Thereafter the foreign born rate rises strongly and closes the gap with native-born.

These differences are greater for women than men, but they indicate the difficulty of projecting future labor-force participation for any group that is shifting its relative mix of foreign and native-born members. If the foreign-born population in a particular age segment is growing, that would tend to depress labor-force participation, and if the native-born population is increasing relative to the foreign born, that would raise participation.

EXHIBIT 4

Labor-force participation rates in 2010 by age and nativity, women only



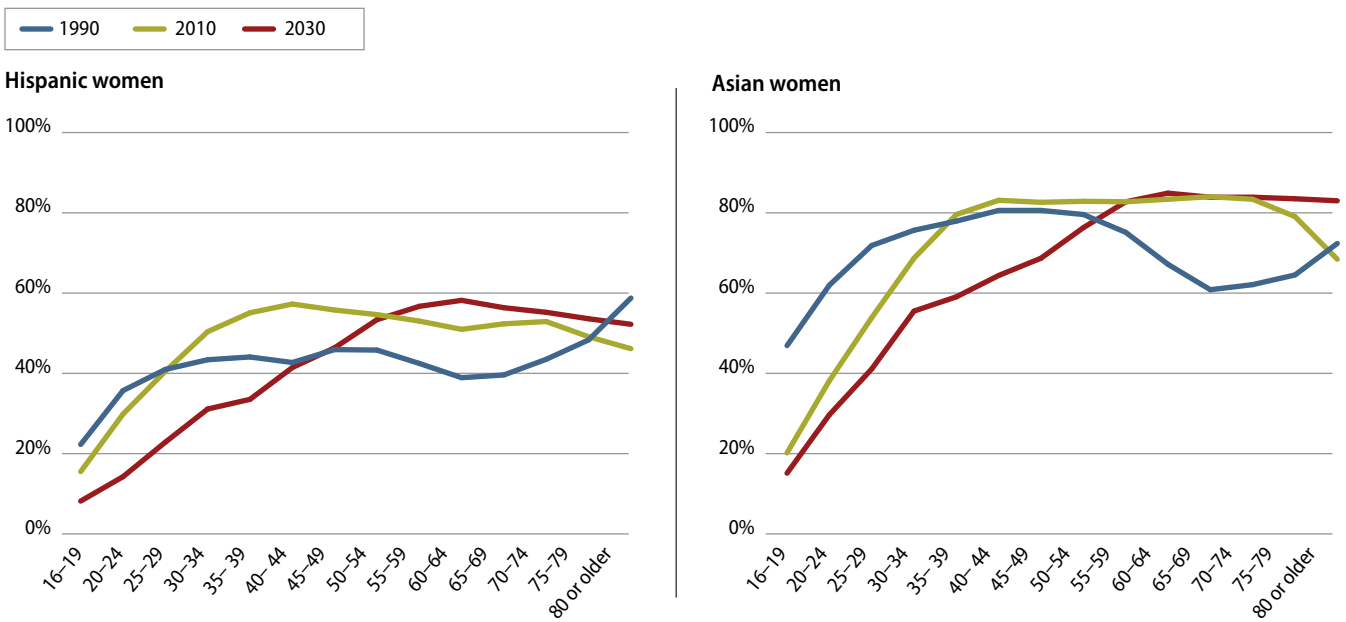
Source: Current Population Survey. 2010.

Changes in the relative shares of native- and foreign-born populations vary greatly by age, as shown in Exhibit 5. Among both Asian and Hispanic women, the foreign-born share was higher at most ages in 2010 than in 1990. Between 2010 and 2030, however, the trend in the foreign-born share at younger ages is reversed, falling by 10 percentage points to 20 percentage points. That means that the higher LFPR of native-born women will take on greater weight in determining the overall future labor-force participation of Asian and Hispanic women.

Without explicit disaggregation by nativity, it would be difficult to project trends in labor-force participation rates. What appear to be sluggish increases for an ethnic group in a period when the foreign-born share is rising could turn into rapid increases when the native-born share rises in the next period. Of course, increases in the number of immigrants still lead to more workers. The technical problem is that without explicit treatment of foreign-born and native-born components, it would be difficult to explain or project the number of workers or their rates of participation. And without explanation of past trends in these rates we can have less confidence in any projection of future workforce numbers.

EXHIBIT 5

Changing foreign-born share of population by age in 1990, 2010, and 2030



Source: 1990 Census; 2010 American Community Survey; Pitkin-Myers population projections.

We turn next to the analysis of the coming wave of Baby Boomer retirements.

Section 4: The coming wave of Baby Boomer retirements and their characteristics

The normal workings of the labor market entail the exit of older workers into retirement and an intake, or entrance, of new workers at younger ages. Growth in the labor force requires that the entries be greater than the exits.

From the standpoint of individual workers and their opportunities, however, it is important to measure more than growth. The total employment opportunities available to workers include the sum of two factors: the growth in employment positions and the replacement of the exiting workers. (Later in this report we add a third factor, namely the added job openings created when workers leave one job for another but remain in the workforce.) What should not be overlooked is that, typically, the replacement opportunities are much greater than the growth factor, and the large size of the Baby Boom generation will place even greater stress on replacement needs as it passes into retirement years.

Magnitude of potential Baby Boomer retirements

The Baby Boom generation is made up of those people who were ages 45 to 64 in 2010 and included 59.7 million workers at that time (including all who were employed or looking for work),[14] along with an additional 6.9 million workers ages 65 and older. Over the next 20 years, the Baby Boomers will advance to ages 65 to 84, and the bulk will have exited the workforce. This drawdown in numbers of this large generation is expected to be substantially greater than in earlier periods. In 1990, for example, only 32.1 million workers were ages 45 to 64, and another 3.8 million were ages 65 and older. Thus, the total number of workers ages 45 to 64 in 2010 is 85.9 percent greater than it was in 1990, suggesting that the replacement need will be that much greater.

The larger size of the Baby Boom population is magnified by its high rate of labor-force participation late in its career—74 percent in 2010, compared to 69.6 percent

for the preceding generation that occupied the same age range in 1990. These additional workers constitute a larger pool of potential retirees leaving the workforce. That potential outflow is diminished, however, by the growing trend of delayed retirement, as reflected in the relatively higher labor-force participation after age 65 since 1990.

The trend toward later retirement dampens the potential impact of the Baby Boomers' exits when they reach retirement age. As a measure of this, we can estimate how many more exits would occur from the workforce if the LFPR remained constant at its 2010 level rather than continue shifting to higher levels. This is a hypothetical assumption that is counter to all evidence of prospective change, but this illustrative calculation provides a baseline against which to measure the impact of the projected changes. During the decade of 2010 to 2020, if the constant LFPR assumption were adopted instead, it would yield 31.4 million exits instead of the projected 27.3 million exits, a difference of 4.1 million, or 15.2 percent more exits than actually projected. During the decade of 2020 to 2030, hypothetical exits would be 34.9 million instead of 31.3 million, a difference of 3.6 million, or 11.4 percent. Our projections therefore anticipate 7.7 million fewer exits, and hence fewer workforce replacements needed, than would have been expected to occur were retirements not being delayed.

Summarizing exits from the workforce

Estimating outflows from the workforce requires that we trace specific cohorts as they grow older, apply the rates of labor-force participation that are expected to pertain at the end of each decade, and then subtract the number of remaining workers from the number that were present at the beginning of the decade. We have carried out this procedure for each detailed segment of the population, as defined by age, gender, race, and nativity. The results are summarized in the table of entries and exits presented in the appendix table.

The number of exits from the workforce has increased each decade since 1990. During the 1990s, 18.8 million people left the workforce, followed by 23.4 million who left in the 2000s. These numbers will grow ever larger in coming decades, as the large Baby Boom cohorts move into retirement years. In the decade from 2010 to 2020, even with our assumption of increasing delay in retirement, a total of 27.3 million workers are expected to leave the workforce. That will be followed by another 31.3 million exits in the decade from 2020 to 2030. These exits are almost all after age 50 and occur among both men and women.

Exits from the workforce vary a good deal by nativity and immigrant generation. Immigrants make up only a small share of those who are exiting the workforce, 8.3 percent in the most recent decade, but are slated to rise to nearly twice that share—15.9 percent—in the decade between 2020 and 2030. (see Exhibit 6) The reason for the rise is that immigrants who arrived as young workers in the 1980s, a larger number than in earlier decades, are expected to be reaching their retirement years some 40 years later.

EXHIBIT 6

Exits by nativity and generation, 1990 to 2030

	Native, generation 3	Native, generation 2	Foreign born	Total
1990s	15,882,928	1,597,951	1,299,067	18,779,947
2000s	20,226,427	1,186,884	1,945,551	23,358,861
2010s	22,435,820	1,131,791	3,731,786	27,299,396
2020s	25,008,073	1,312,637	4,977,616	31,298,326
Percentage of total exits				
1990s	84.6	8.5	6.9	100
2000s	86.6	5.1	8.3	100
2010s	82.2	4.1	13.7	100
2020s	79.9	4.2	15.9	100

Source: Calculated from Pitkin-Myers workforce projections.

Meanwhile, the second generation, children of immigrants, will be falling as a share of labor-force exits. In the 1990s the last children of immigrants from the early 20th century were exiting the workforce. With the abrupt cessation of immigration after 1924, many fewer second-generation individuals were born from 1930 to 1980.

Exits from the workforce also vary by race and ethnicity. The vast majority of retirees in the most recent decade were non-Hispanic whites (82.6 percent), but that share is expected to decline moderately in coming decades, falling to 70.5 percent in the 2020s. (see Exhibit 7) The decline occurs because the share that are Hispanic retirees is expected to rise by 7 percentage points (and that of Asians and Pacific Islanders by 2.4 percentage points) from the most recent decade. The ranks of these two groups were greatly bolstered by the arrival of young migrants in the 1980s and later. Eventually they too will join the ranks of retirees.

EXHIBIT 7

Exits by race and ethnicity, 1990 to 2030

	1990s	2000s	2010s	2020s
Hispanic	931,619	1,316,468	2,575,857	3,864,001
Non Hispanic White	14,818,449	19,321,590	20,086,117	22,070,800
Non Hispanic Black	2,602,926	1,968,857	3,294,927	3,586,070
Native American	83,949	178,162	237,441	257,953
Asian, Pacific Islander	343,003	573,784	1,105,054	1,519,501
Total	**18,779,947**	**23,358,861**	**27,299,396**	**31,298,326**
Percentage of total exits				
Hispanic	5	5.6	9.4	12.3
Non Hispanic White	78.9	82.7	73.6	70.5
Non Hispanic Black	13.9	8.4	12.1	11.5
Native American	0.4	0.8	0.9	0.8
Asian, Pacific Islander	1.8	2.5	4	4.9
Total	**100**	**100**	**100**	**100**

Source: Calculated from Pitkin-Myers workforce projections.

A tsunami of Baby Boomer retirements

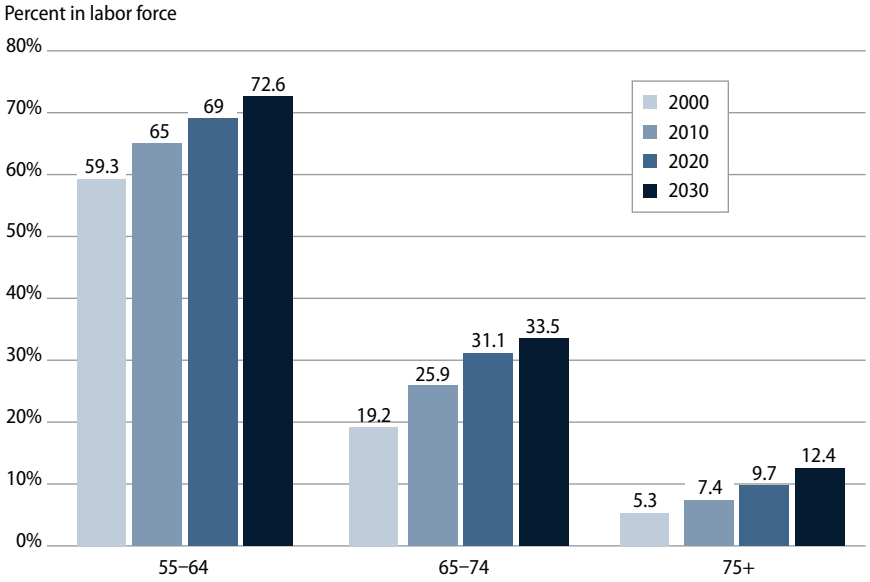
The information on exits from the labor force can be used to describe and explain the tsunami of Baby Boomer retirements that is now occurring in the United States. This long wave will be driven by demographics and modified by trends in labor force participation. The labor-force participation rates for workers ages 55 and older have been increasing and are expected to increase further in the next 20 years, as increased longevity and better health are allowing more workers to continue in the workforce in many occupations.

The chart below shows the trend of rising labor-force participation rates for older workers over time. Increases in labor-force participation for older workers occurred between 2000 and 2010 and are projected to continue, as explained in the previous section.

The labor-force participation rate for workers ages 55 to 64 increased from 59.3 percent in 2000 to 65 percent in 2010 and is projected to increase to 69.1 percent in 2020 and 72.6 percent in 2030. The comparable figures for workers ages 65 to 74 are 19.2 percent (2000); 25.9 percent (2010); 31.2 percent (2020); and 33.6 percent (2030), and from 5.3 percent (2000) to 7.4 percent (2010); 9.8 percent (2020); and 12.5 percent (2030) for workers ages 75 and older.

EXHIBIT 8

Older Americans will work longer



Source: Calculated from Pitkin-Myers workforce projections.

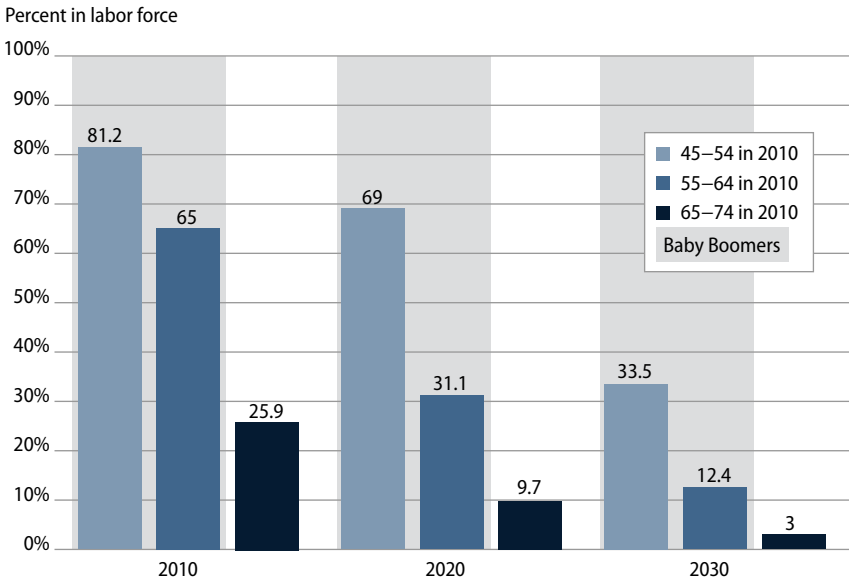
Despite this trend toward working later in life, 27.3 million workers are expected to leave the workforce[15] between 2010 and 2020, and another 31.3 million are projected to exit between 2020 and 2030.

The reason is that labor-force participation declines rapidly with age. So even though residents ages 55 to 64 will work more in the future, they will participate at a much lower rate than when they were 10 years younger. As shown below, workers ages 45 to 54 in 2010 had an 81.3 percent participation rate, but 10 years later in 2020, when they will be ages 55 to 64, their participation rate drops to 65 percent and to 25.9 percent by 2030, when they will be in the 65-to-74 age group. Workers ages 55 to 64 in 2010 go from a 69.1 percent participation rate to 31.2 percent in 2020 and to 9.8 percent in 2030, and workers ages 65 to 74 go from a participation rate of 33.6 percent in 2010 to less than 3 percent in 2030 as they move into older age groups.

This decline in labor-force participation as cohorts of workers age will create a tsunami of Baby Boomer retirements over the next two decades.

EXHIBIT 9

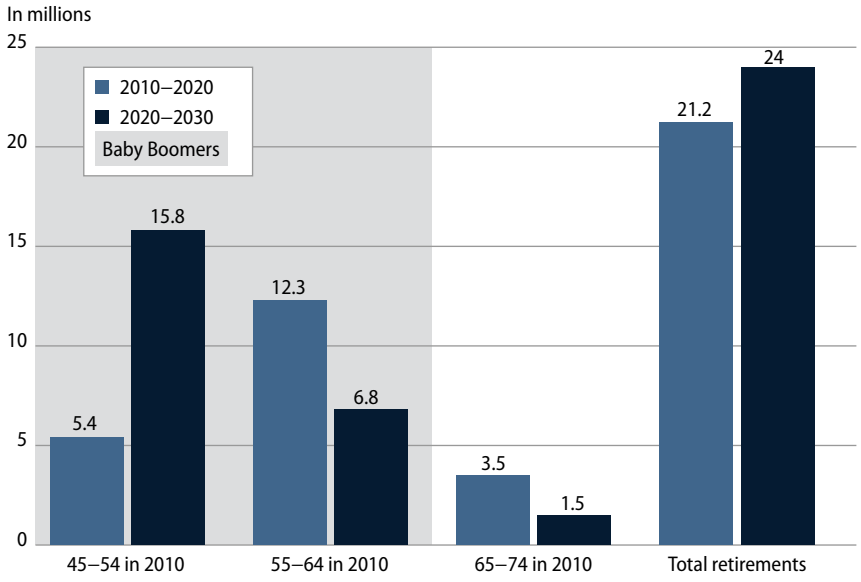
Labor-force participation will decline as Baby Boomers age



Source: Calculated from Pitkin-Myers workforce projections.

EXHIBIT 10

Baby Boomer retirements, 2010 to 2030



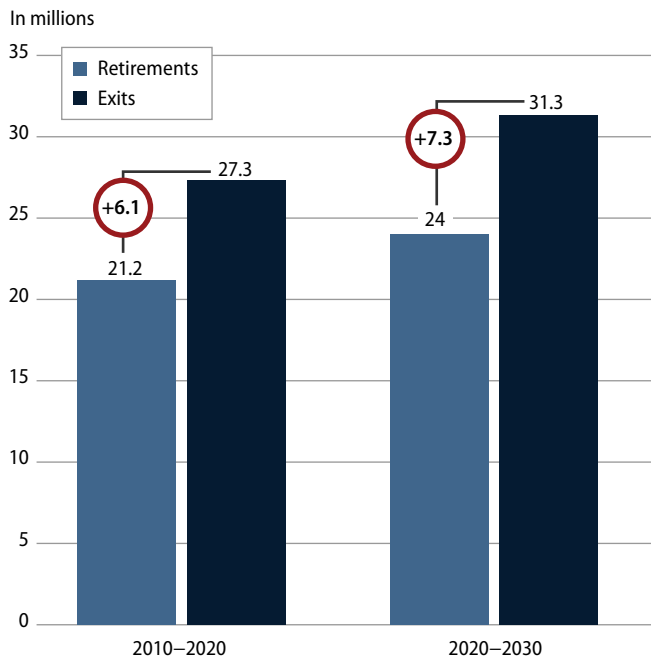
Source: Calculated from Pitkin-Myers workforce projections.

Based on these labor-force participation-rate trends, 21.2 million workers will retire between 2010 and 2020—5.4 million as they age from 45 to 54 to 55 to 64[16]; 12.3 million as they age from 55 to 64 to 65 to 74; and another 3.5 million (from the cohort older than the Boomers in 2010) as they age from 65 to 74 to 75 to 84. Between 2020 and 2030 another 24 million workers will retire, as shown above—drawn mostly from workers in the 45-to-54 age group in 2010 that will be in the 65-to-74 age group in 2030.

All told, these 45.2 million retirements account for the vast majority of the exits from the labor force between 2010 and 2030; 40.2 million retirements will occur with the Baby Boomers alone. Some retirees are forced to leave the workforce as a result of disability or discouragement, but the large majority leave through a decision to end their careers. The number of exits from the workforce is larger than the number of retirees calculated above primarily because some workers leave the workforce when they die.

EXHIBIT 11

Exits versus retirements (in millions)



Source: Calculated from Pitkin-Myers workforce projections.

Section 5: The flow of replacement workers and their characteristics

The steadily rising tide of exits from the workforce reflects the arrival of the Baby Boomers in retirement years. Even with our assumptions of continued delay in retirement that follow the BLS projections, we find a need to replace a massive number of retirees , as well as a need to meet the demands of overall growth in the labor force. Who will fill these growing needs is an important question.

There are three categories of new entrants to the workforce: grown children of native-born parents; immigrants; and grown native-born children of immigrants (the second generation). We estimate the numbers for each of these three sources of new additions to the future labor force. At the same time, we also trace what race/ethnic groups will be providing the needed workers.

Estimation of inflows of new workers follows a parallel method to the estimation of exits. We trace specific cohorts as they grow older, apply the rates of labor-force participation that are projected to pertain at the end of each decade, and then subtract the number present at the beginning of the decade from those at the end. This measure of labor-force entrants is a net cohort measure of growth. We have carried out this procedure for each detailed segment of the population, as defined by age, gender, race, and nativity. The results are summarized in the table of entrances and exits presented in the appendix table.

The total number of entrants to the workforce has gradually climbed from 37.1 million in the 1990s, with projections to 42.8 million in the 2020s. Beneath the surface of this gradual change are some important shifts in the characteristics of the new entrants to the workforce.

The share of immigrants has been relatively stable, ranging between 22 percent and 25 percent of the new entrants each decade. (see Exhibit 12) In the most recent decade, the share of entrants made up of immigrants is three times as large as the immigrant share of the exits. The children of immigrants (the second generation) are anticipated to triple their share of the workforce entrances, rising

from 6 percent in the 1990s to 17.9 percent in the 2020s. At that time the second-generation share of entrances will be more than four times greater than their share of the exits.

EXHIBIT 12

Nativity of entrances to the workforce by generation, 1990 to 2030

	Native, generation 3	Native, generation 2	Foreign born	Total
1990s	26,492,224	2,211,892	8,443,048	37,147,164
2000s	23,826,038	3,189,631	8,830,193	35,845,863
2010s	26,013,183	5,240,390	8,761,006	40,014,580
2020s	25,326,749	7,674,463	9,808,356	42,809,568
Percentage of total entrants				
1990s	71.3	6	22.7	100
2000s	66.5	8.9	24.6	100
2010s	65	13.1	21.9	100
2020s	59.2	17.9	22.9	100

Source: Calculated from Pitkin-Myers workforce projections.

Altogether, immigrants and their children combined will account for 40.8 percent of the entrances to the workforce in the 2020s. That is in contrast to their 20.1 percent share of the workforce exits. (see Exhibit 6) Meanwhile, the native-born third or later generations are steadily falling as a share of entrances, dropping from 71.3 percent in the 1990s to 59.2 percent in the 2020s. It is clear that a very large portion of the workforce needs caused by the Baby Boom retirements is going to be met by immigrants and their children.

Entrances to the workforce also vary by race and ethnicity. A slight majority of entrances in the most recent decade were non-Hispanic whites (53.5 percent), but that share is expected to decline moderately in coming decades, falling to 46.3 percent in the 2020s. (see Exhibit 13) Meanwhile, the Hispanic share of the entrances is steadily rising, from 23.7 percent in the most recent decade to 29.9 percent in the 2020s. At that time African Americans will account for 13 percent of entrances to the workforce, Asians and Pacific Islanders 10.1 percent, and Native Americans 0.7 percent.

EXHIBIT 13

Race of entrants to the workforce, 1990 to 2030

	1990s	2000s	2010s	2020s
Hispanic	7,076,720	8,495,321	10,018,547	12,815,694
Non Hispanic White	22,671,324	19,190,799	20,634,179	19,819,141
Non Hispanic Black	4,282,480	5,000,243	5,406,783	5,548,366
Native American	328,903	281,250	322,027	281,207
Asian, Pacific Islander	2,787,736	2,878,249	3,633,044	4,345,160
Total	**37,147,164**	**35,845,863**	**40,014,580**	**42,809,568**
Percentage of total entrants				
Hispanic	19.1	23.7	25	29.9
Non Hispanic White	61	53.5	51.6	46.3
Non Hispanic Black	11.5	13.9	13.5	13
Native American	0.9	0.8	0.8	0.7
Asian, Pacific Islander	7.5	8	9.1	10.1
Total	**100**	**100**	**100**	**100**

Source: Calculated from Pitkin-Myers workforce projections.

Section 6: Net changes in the labor force

Over a decade, net changes in the workforce result from the difference between the flow of new entries into the workforce and the flow of workers leaving at the end of their careers. However, a much larger pool of experienced workers remains in the workforce. This was outlined previously in Exhibit 2. At any time, different population groups are more concentrated in some stages than others, and their relative prominence changes over the decades.

The net changes in the workforce in any period amount simply to the difference between the exits and entries. Previously, we accounted for the immigrant generational or racial shares of exits and entries. Here, we examine the shares of the net changes, a focus on how the workforce is changing at the margin.

The total growth in the workforce is slowing, from 18.4 million in the 1990s to 11.5 million projected in the 2030s. Not all groups have been contributing equally to this growth in the workforce. In this section, we examine differences by immigrant generation and by race/ethnicity in past and projected growth of the workforce.

Contributions of immigrant generations

The share of net growth comprising native-born, third- or later-generation workers fell from 10.6 million net additional workers in the 1990s and 3.6 million in the 2000s and is projected to decline further to 319,000 added workers in the 2020s. This diminished growth is due to both smaller cohorts of young native-born people entering the workforce and the large Baby Boom cohorts that will be exiting.

Over the same decades, the net growth in foreign-born workforce is projected to continue a gradual decline, from 7.1 million in the 1990s to 4.8 million in the 2020s. By contrast, the net growth of the native-born children of immigrants, the second generation is projected to rise sharply in the future. From a paltry gain in the 1990s, this group tripled its net growth to 2 million in the 2000s. Its growth is

projected to double again to 4.1 million in the current decade, with an additional net increase of 6.4 million projected in the 2020s. (see Exhibit 14)

EXHIBIT 14

Contributions of immigrant generations to net changes in the workforce

	Native, generation 3	Native, generation 2	Foreign born	Total
1990s	10,609,296	613,941	7,143,981	18,367,217
2000s	3,599,611	2,002,748	6,884,642	12,487,001
2010s	3,577,363	4,108,600	5,029,220	12,715,183
2020s	318,676	6,361,826	4,830,741	11,511,242
Percentage of the net changes				
1990s	57.8	3.3	38.9	100
2000s	28.8	16	55.1	100
2010s	28.1	32.3	39.6	100
2020s	2.8	55.3	42	100

Source: Calculated from Pitkin-Myers workforce projections.

Taken altogether, a total reworking is underway in the three generations' share of total workforce growth. The immigrant share reached its peak in the 2000s, when it contributed 55.1 percent of total growth. In the 2020s immigrants are still projected to account for 42 percent of total growth. Meanwhile, the native-born children of immigrants are projected to reach a 55.3 percent share of the growth in the 2020s, while the third or later generations will have fallen to only a 2.8 percent share of the total growth. Immigrants and their children already accounted for 71.1 percent of growth in the 2000s, the most recent decade completed, and they are projected to account for virtually all of the growth in the 2020s.

Contributions of racial and ethnic groups

Back in the 1990s non-Hispanic whites comprised the largest share of growth in the workforce, a net increase of 7.9 million workers. (see Exhibit 15) After that decade this segment's growth was sharply reduced and was a net negative in the 2000s. A slight upturn in growth in the current decade reflects the larger size of the so-called Millennial generation, the children of the Baby Boomers, many of whom are white and now passing through their 20s, prime years for entering the workforce.

Consistent throughout are the increases in the number of Hispanics in the workforce, which expands from a net increase of 6.1 million in the 1990s to 9 million

projected for the 2020s. (see Exhibit 15) The numbers of Asians and Pacific Islanders also show continuous growth, albeit at about one-third the level of Hispanics, reaching an increase of 2.8 million projected for the 2020s. The numbers of African Americans in the workforce are projected to add another 2 million net increase in each of the next two decades.

EXHIBIT 15

Contributions of different racial/ethnic groups to net changes in the workforce

	1990s	2000s	2010s	2020s
Hispanic	6,145,101	7,178,853	7,442,689	8,951,693
Non Hispanic White	7,852,875	-130,791	548,062	-2,251,659
Non Hispanic Black	1,679,554	3,031,385	2,111,856	1,962,296
Native American	244,954	103,089	84,586	23,254
Asian, Pacific Islander	2,444,733	2,304,465	2,527,990	2,825,659
Total	**18,367,217**	**12,487,001**	**12,715,183**	**11,511,242**
Percentage of net changes				
Hispanic	33.5	57.5	58.5	77.8
Non Hispanic White	42.8	-1	4.3	-19.6
Non Hispanic Black	9.1	24.3	16.6	17
Native American	1.3	0.8	0.7	0.2
Asian, Pacific Islander	13.3	18.5	19.9	24.5
Total	**100**	**100**	**100**	**100**

Source: Calculated from Pitkin-Myers workforce projections.

Viewing each group's percentage share of total workforce growth, what is most striking is that the non-Hispanic white population is shifting from the largest share in the 1990s (42.8 percent of the total growth) to a negative share in the 2000s and again in the 2020s. (see Exhibit 15) Meanwhile, the Hispanic share of net growth is steadily mounting, projected to reach 77.8 percent of all the growth expected in the 2020s. At that time Asians and Pacific Islanders will account for 24.5 percent of total net growth and African Americans 17 percent.

Section 7: Job growth, job openings, and occupation change—the impact of Baby Boomer retirements

The demand for workers comes from two sources: job growth in the economy and job openings to replace existing workers who retire or leave their current occupations. In analyzing the policy implications of future job trends, it is important to take note of this distinction between new or additional jobs and replacement job openings, as replacement job openings are the largest share of total job openings, and the share of replacement job openings will increase as Baby Boomers retire.

Reports often focus on the amount and industry composition of job growth when discussing education, training, and immigration policy. They focus on where the new and fast-growing job sectors are and what skills are needed by high-growth industries. In fact, most job openings come from replacing existing workers who either retire or die. In addition, for this analysis following conventions of the Bureau of Labor Statistics, we extend the definition of replacement job openings to also include workers who change occupations. Both from the point of view of job seekers but also from a public policy perspective, these replacement jobs deserve our attention.

Between 2010 and 2020 the nation will need to fill 47.9 million job openings. But less than half, or 20.6 million, will come as a result of job growth. And of these 20.6 million added jobs, 8.5 million represent a recovery of jobs lost during the recession, with 12.1 million jobs added from additional growth. (see Exhibit 16) The other 27.3 million job openings will be to replace workers, most of whom leave existing jobs for retirement.

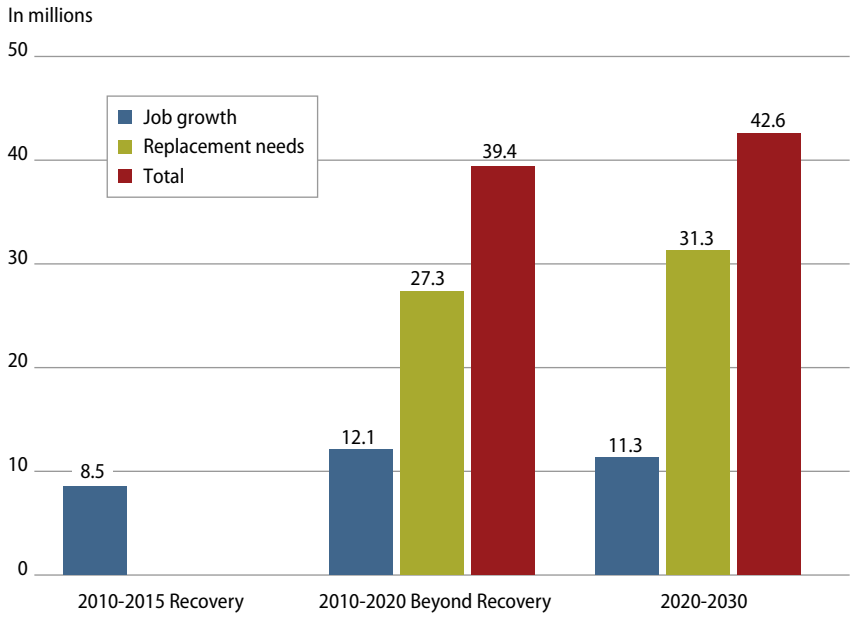
The balance between replacement job openings and job openings from growth swings more heavily toward replacement openings in the 2020 to 2030 decade, as job growth slows but retirements remain high. Between 2020 and 2030 the nation will need to fill 42.6 million job openings.[17] The continuation of Baby Boomer retirements is anticipated to lead to the growth of only 11.3 million jobs. Replacement job

openings, at 31.3 million, will be close to the levels between 2010 and 2020. Seventy-three percent of the job openings in this decade, however, will come from replacements, compared to 57 percent in the previous decade.

A reasonable scenario[18] is that 47.9 million job openings created during the decade between 2010 and 2020 will be filled by 40 million entrants to the labor force, by 6 million currently unemployed members of the workforce who find jobs (thereby lowering the unemployment rate to 5.5 percent), and by nearly 2 million more members of the workforce taking multiple jobs. Similarly, the 42.6 million new job openings created during the decade between 2020 and 2030 could be filled by the 42.8 million entrants to the labor force with small changes in the numbers of unemployed workers and those holding more than one job.

EXHIBIT 16

Job openings, 2010 to 2030



Source: Authors' analysis and extension of labor-force projections to 2020 from Mitra Toossi, "Labor force projections to 2020: a more slowly growing workforce" (U.S. Bureau of Labor Statistics, 2012), available at http://www.bls.gov/opub/mlr/2012/01/art3full.pdf.

The Bureau of Labor Statistics has published projections of the growth in jobs and job openings with detail in terms of occupations and job openings from growth and replacement.[19] These projections, which extend from 2010 to 2020, are the basis for the analysis below of job openings and educational and training implications. The BLS definition of replacement jobs is broader than ours, as noted above, because it includes job openings in some professions that occur when workers stay in the workforce but leave their current occupations to take different jobs. When workers change occupations, the jobs they leave behind must be filled with replacements. Although replacement jobs due to occupation change do not add to net job openings, they do affect the composition of replacement jobs available to job seekers and are worth examining.

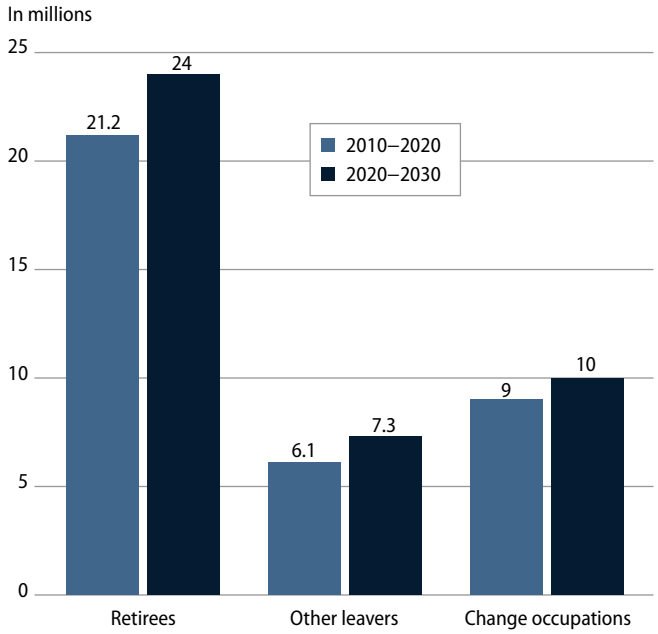
To make our numbers consistent with the BLS definition of replacement jobs, we add 9 million job openings between 2010 and 2020 and 10 million between 2020 and 2030 that are the result of people moving from one occupation to

another within the labor force. Hence, using this broader definition of replacement jobs, we project 36.3 million and 41.3 million total replacement jobs in each decade. Exhibit 17 breaks down our projected broader replacement jobs by decade in terms of those due to retirement, other leavers (death, disability, or other reasons), and occupation change.

The BLS projections to 2020 are slightly lower than our analysis in terms of projected labor-force growth (20.5 million compared to our 20.6 million) and replacement job openings (34.3 million compared to our projection of 36.3 million). The BLS projections, however, provide the best picture available of the kinds of labor needs the economy will face up to 2020. It was beyond the scope of this analysis to extend the occupational and industry projections to 2030, but other national forecasts to 2030 are consistent with the broad pattern of change expected between 2020 and 2030 in terms of industry and occupational change.

EXHIBIT 17

Causes of replacement job openings, 2010 to 2030



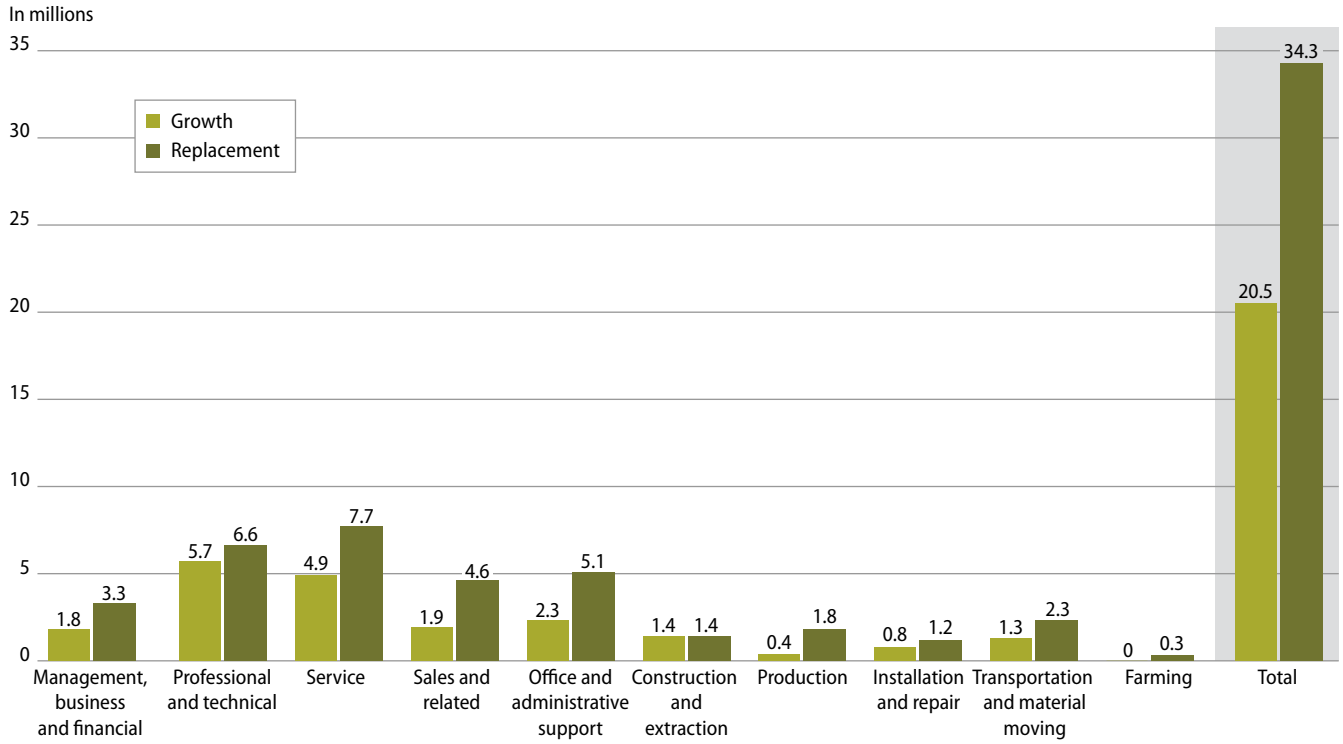
Source: Authors' analysis and extension of labor-force projections to 2020 from Mitra Toossi, "Labor force projections to 2020: a more slowly growing workforce" (U.S. Bureau of Labor Statistics, 2012), available at http://www.bls.gov/opub/mlr/2012/01/art3full.pdf.

As the nation recovers from a long recession, the economy will need large numbers of workers in all major occupations when replacement-job- and occupation-change-induced needs are included in the projections. Replacement job openings account for the majority of total job openings in all occupations except professional and technical occupations and construction. As shown below, replacement job openings account for the large majority of total job openings in sales, office, and production occupations. Service occupations, which include food service, have a large number of new and replacement jobs.

Professional and technical occupations have the largest numbers of openings from job growth, nearly 6 million, and these jobs require above-average levels of education and training. (see Exhibit 18) In addition, 6.6 million replacement job openings will become available in professional and technical occupations. Projected construction job growth is entirely the result of recovering a portion of the jobs lost during the recession.

EXHIBIT 18

Job openings, 2010 to 2020 (in millions)



Source: Occupational employment and job-openings data, projected 2010 to 2020, and worker characteristics, 2010, from U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

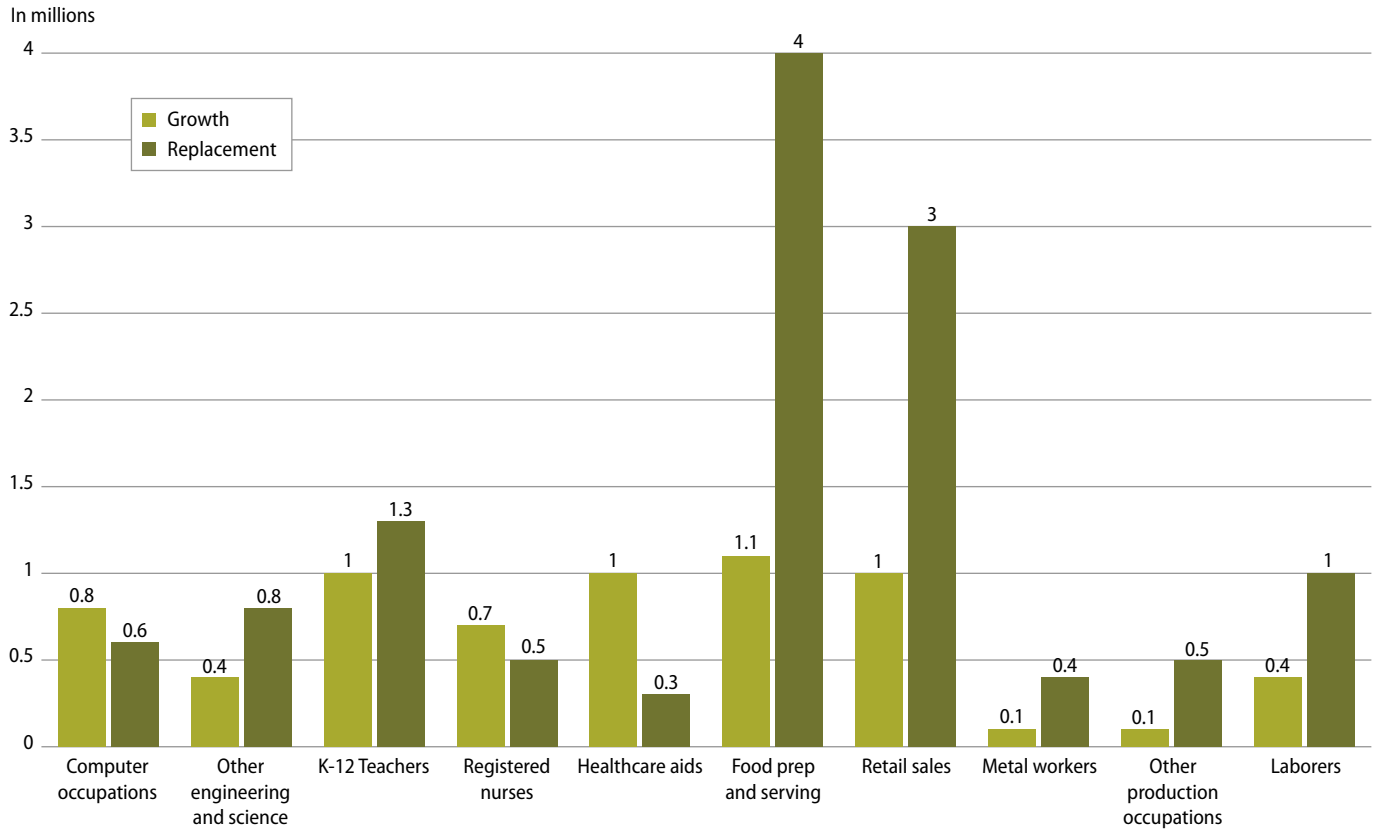
The ratio of replacement job openings to openings from new job growth would be even larger if the recovery of jobs lost during the recession is removed from the job-growth category. In the BLS projections, construction and manufacturing jobs never surpass the 2007 level, and financial-activity job levels return to 2007 levels by 2020. This strengthens the case for why replacement job openings should be a primary focus of policy attention in the coming years.

Different types of replacement job openings

Most job openings are the result of people leaving the workforce. Some replacement job openings, however, occur in occupations where many workers move on to higher-skill occupations after using these jobs as entry-level positions to gain experience or to help pay the bills while they are in school or pursuing other careers. Some examples are shown below. (see Exhibit 19)

EXHIBIT 19

Job openings by major occupational group, 2010 to 2020 (in millions)



Source: Occupational employment and job-openings data, projected 2010 to 2020, and worker characteristics, 2010, from U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

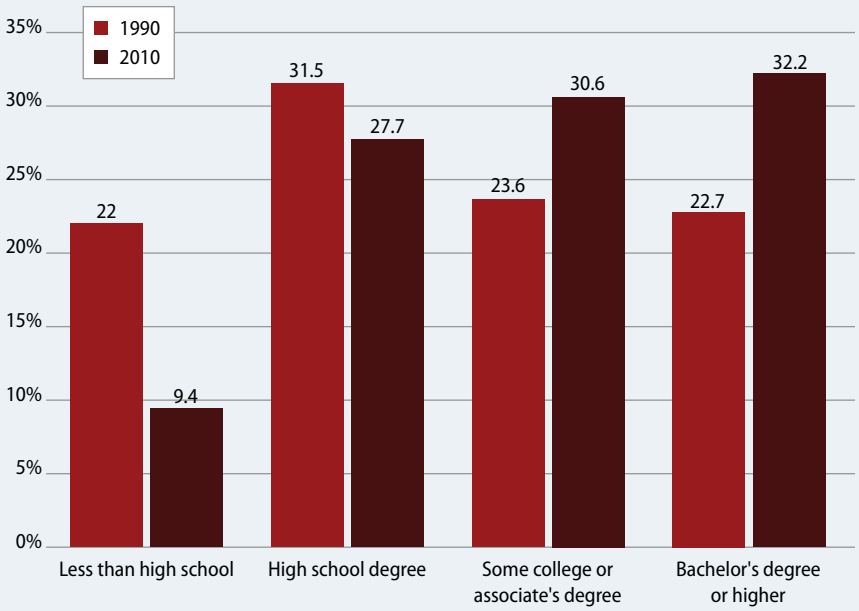
In a few occupations, job growth provides the largest number of openings. Familiar examples include computer-related occupations, registered nurses, and nursing and home health aides. In other occupations, replacement job openings are far larger than openings from job growth. Chief examples include retail sales and food preparation (primarily cooks) and food-service workers. In these occupations, many workers take these jobs to get started in the workforce and then move on to other fields, meaning there is a continuous supply of openings available to new workers.

There is a second type of occupation where most of the openings come from replacing workers who leave work as they retire. Many production, installation, repair, and transportation and material-moving occupations fit into this category. Examples of these occupations include metal workers, laborers, and other production-worker occupations. These occupations have very little projected job growth, and in some cases, projected job declines, yet they have the need to replace a significant number of retiring Baby Boomers.

The impact of Baby Boomer retirements on the education level of the workforce

Workers of the Baby Boom generation are not only older and more experienced than younger groups, but they are also better educated than cohorts that occupied similar preretirement ages in earlier decades. As a result, their retirement will demand replacements that are more skilled than were the workforce replacements in earlier decades. As shown in the sidebar chart, a much smaller share of Baby Boomers, who were ages 45 or older in 2010, have less than a high school education (9 percent) compared to the low-education share of those who were in this preretirement age in 1990 (22 percent). Conversely, a much larger share of the Boomers in the workforce have achieved some college or an associate's degree (31 percent versus 23.5 percent) or have a bachelor's degree or higher (32 percent versus 22.5 percent). Given that these education levels are well above the preretirement cohort of 1990, this means that the workers needed to replace the Baby Boomers will be skewed toward higher education levels as well.

Education of workforce ages 45 and older, 1990 and 2010



Source: 1990 Census; 2010 American Community Survey.

The wide variety of job openings that will have to be filled by 2030 has several implications for education, workforce training, and immigration policy. There are three main takeaways from this section. First, replacement job openings, not just those from total growth, should get careful attention in the design of immigration, education, and other workforce policies. Second, the nation will need new workers at virtually all skill levels once the large number of retirements is taken into account. Third, the loss of so many experienced workers when the Baby Boomers retire puts an emphasis on immigration policy tied to replacing these workers and on policies that help existing workers move up. A final observation is that even though this analysis has emphasized workforce demands anticipated over the coming decade or two, even in this time of high unemployment some businesses already report shortages of workers in occupations that range from farming to manufacturing and even to high tech.

Section 8: Education and skill requirements of new and replacement jobs

The job openings from growth and from replacing workers who leave the labor force will be filled by workers in three broad categories:

1. New entrants to the labor force.[20]

2. Existing workers who can improve their skills and can take better jobs. In the short term, some existing workers will return after being unemployed.

3. New immigrants.

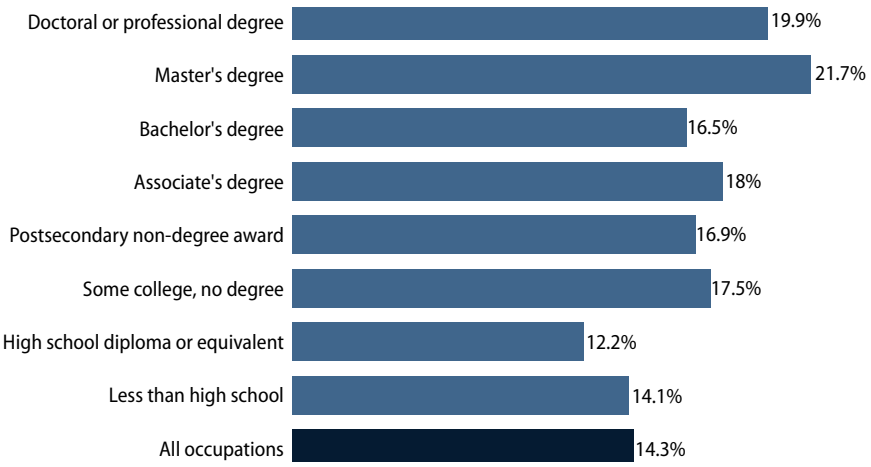
The new entrants will be younger and have less experience than the average educational and experience profile for existing workers and new immigrants.

With this introduction, the report now looks at the educational and other requirements of new and replacement job openings. The Bureau of Labor Statistics has introduced a new and more detailed analysis of pathways to new and replacement job openings. Job openings are analyzed in three dimensions—educational requirements, training requirements, and experience requirements.[21]

The jobs that will be added between 2010 and 2020 have slightly higher educational requirements than today's jobs, but the differences are not large. The Bureau of Labor Statistics projects a 14.3 percent growth for all jobs between 2010 and 2020. A higher growth rate is projected for all job categories requiring more than a high school education, as shown below. The highest growth rate is for jobs requiring a master's or doctoral degree. (see Exhibit 20)

EXHIBIT 20

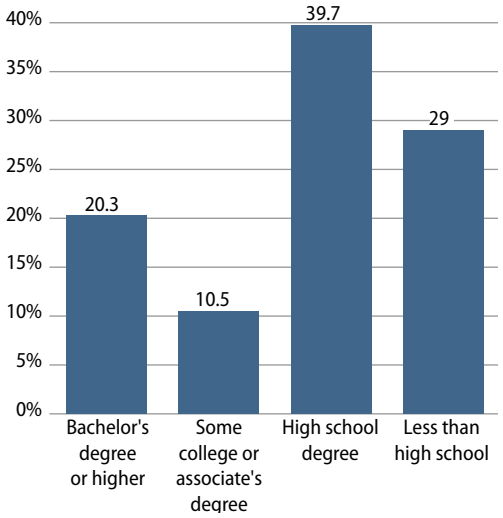
Growth rate by educational attainment for new jobs, 2010 to 2020



Source: Employment and total job openings by education category, 2010, and projected to 2020 from U.S. Bureau of Labor Statistics occupational-employment-projections data from C. Brett Lockard and Michael Wolf, "Occupational employment projections to 2020," Monthly Labor Review (2012).

EXHIBIT 21

Educational requirements for all job openings, 2010 to 2020



Source: Employment and total job openings by education category, 2010, and projected to 2020 from U.S. Bureau of Labor Statistics occupational-employment-projections data from C. Brett Lockard and Michael Wolf, "Occupational employment projections to 2020," Monthly Labor Review (2012).

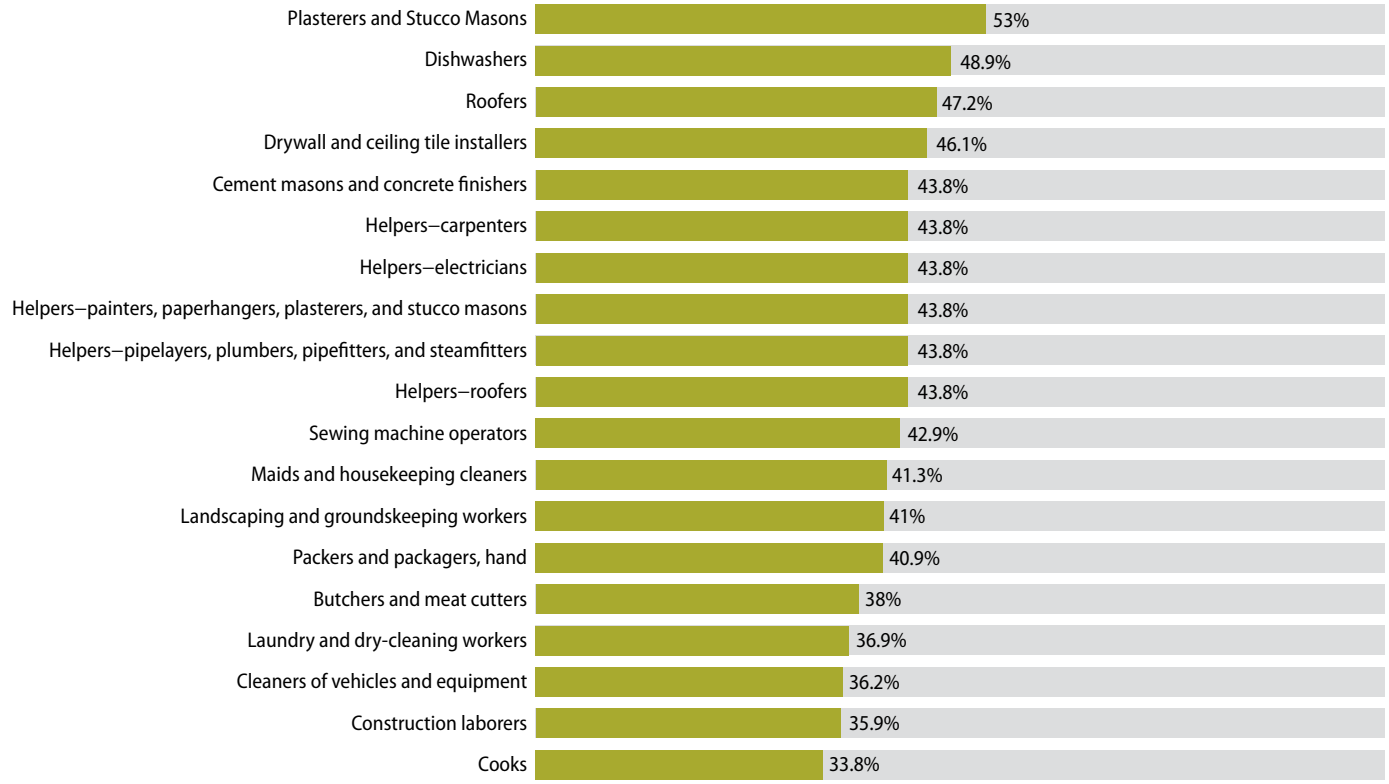
But the educational requirements for all jobs and for all job openings, including new and replacement jobs, are not projected to change much between 2010 and 2020. And the BLS projections, based on 2010 education and occupational profiles, indicate that nearly 70 percent of U.S. jobs will require a high school education or less in 2020.

These data, however, are misleading when it comes to understanding the educational and training implications of filling future job openings. First, skill requirements for all jobs will almost surely increase by 2020 from the 2010 profiles that were used in the BLS occupational/education projections.

Second, most of the jobs requiring less than a high school education are in a small set of occupations—food preparation, some construction occupations, and some production, transportation, and material-moving occupations. And while some are permanent jobs for people throughout their lifetimes, many of these low-skilled jobs are and need to be stepping stones to upward career mobility if we are to fill the country's replacement job openings.

EXHIBIT 22

Selected occupations where more than 30 percent of workers have less than a high school education



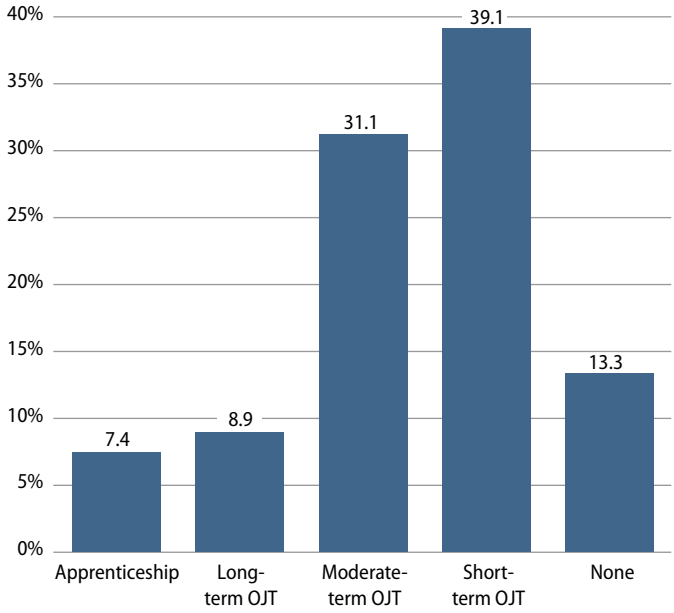
Source: Educational attainment for workers 25 years old and older by detailed occupation from U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

The trends for jobs requiring just a high school degree are worthy of closer analysis.

The BLS data allow us to analyze the impact of additional training and experience for workers who do not need formal education beyond high school. Half of the new jobs requiring no more than a high school education also require moderate or long-term on-the-job training, or OJT, or an apprenticeship, and nearly the same share is required for all new and replacement openings between 2010 and 2020 that require no more education beyond high school.

EXHIBIT 23

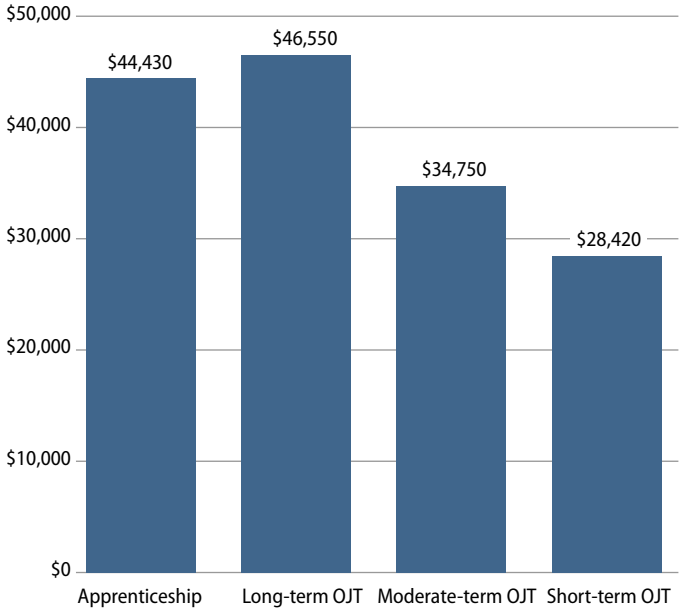
Training requirements for high school graduates in the workforce



Source: Employment by education by on-the-job training category, 2010, and projected to 2020 from U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

EXHIBIT 24

Median earnings for high school graduates by training requirements



Source: Employment by education by on-the-job training category, 2010, and projected to 2020 from U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

The jobs requiring apprenticeship or long-term OJT pay substantially more than the jobs that require only moderate or short-term OJT. High school graduates with apprenticeship or long-term on-the-job training earned nearly $45,000 a year in 2010, compared to $34,750 for graduates with moderate OJT and $28,420 for high school graduates who required only short-term OJT. The implication is that replacing retiring workers with just a high school education will require many workers with additional training beyond high school.

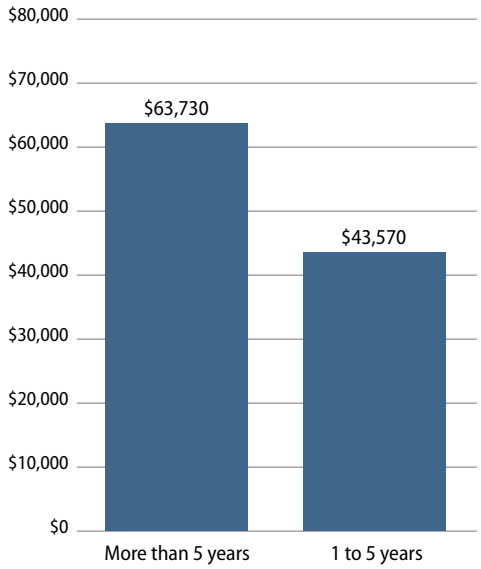
The earnings of high school graduates with no additional training are higher for those workers with more experience such as retiring Baby Boomers will have. In 2010 median earnings for such workers with more than five years of experience was $63,730, compared to $43,570 for less experienced workers.

A new BLS analysis of occupations by education, experience, and on-the-job training gives a picture of the multiple pathways to new and replacement job openings. The common pathways to the new jobs that will be created between 2010 and 2020 show the importance of education, experience, and training. All the pathways to new jobs that will have above-average growth rates to 2020 include both education past high school (9 pathways) or training (1 pathway) and on-the-job training (2 pathways) for workers with a high school education or less.

This analysis of education, training, and experience requirements has important implications for immigration, education, and workforce policies for the nation. The main takeaways are that, while the overall trend of educational requirements for future job openings is toward requiring more education, the nation's job openings will require people with a wide variety of educational attainment. In addition, the findings about multiple pathways to higher-paying jobs should inform policies for the second- and third-generation labor-force entrants who will shape the nation's economic future. Finally, these findings reinforce the findings in Section 7 about the great loss of workforce experience facing the nation as the Baby Boomers retire over the next two decades.

EXHIBIT 25

Median earnings for high school graduates by experience requirements for jobs requiring no training



Source: Authors' analysis of education and training categories by detailed occupation, 2010, based on U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

EXHIBIT 26

U.S. job growth by education/experience and on-the-job training pathways, 2010 to 2020

Education	Experience	On-the-job training	Job Growth 2010–2020
Associate	None	None	23.7%
Doctoral/professional	None	Internship/residency	23.4%
Master's	None	None	22.6%
High school	None	Apprenticeship	22.5%
High school	1–5 years	Short Term	20.4%
Postsecondary non-degree	None	None	19.2%
Doctoral/Professional	None	None	18.9%
Bachelor's	None	None	18.5%
Less than high school	None	Moderate	17.1%
Bachelor's	1–5 years	None	16.6%
Bachelor's	None	Moderate	14.6%
Bachelor's	None	Internship/residency	14.6%
All occupations			**14.3%**

Source: Education and training classification by detailed occupation from U.S. Bureau of Labor Statistics, "Employment Projections: Education and Training Data," available at http://www.bls.gov/emp/ep_data_education_training.htm (last accessed June 2013).

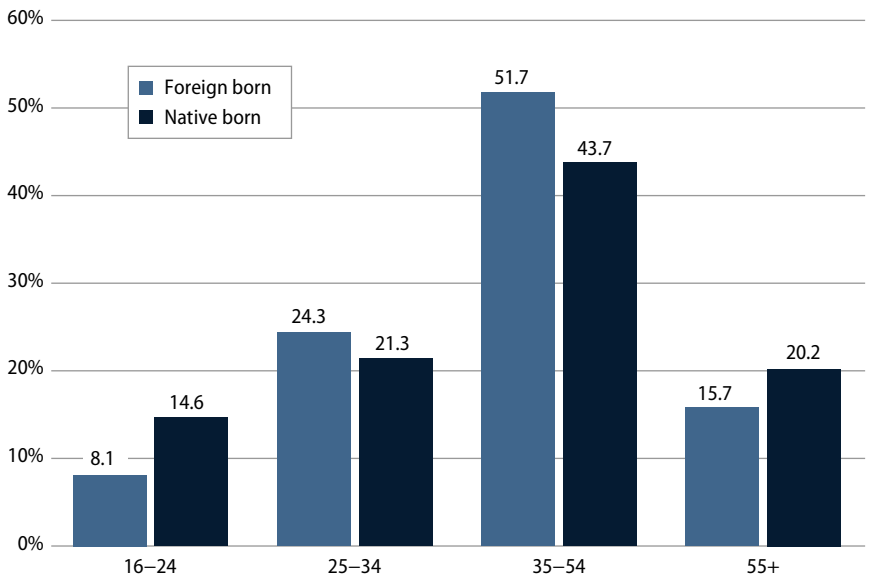
Section 9: Immigrants in today's workforce

There were 25.6 million foreign-born workers in the U.S. workforce in 2010, or 16.6 percent of the total workforce.[22] A substantial minority of all foreign-born workers has unauthorized residence in the United States, and those who lack legal status have somewhat lower earnings and fewer skills than otherwise-similar immigrants.[23] A higher percentage of foreign-born workers were in prime (25 to 54) working age groups, compared to native-born workers.

The majority of foreign-born workers are Hispanic or Asian. Fifty percent of foreign-born workers in 2010 were Hispanic, while native-born Hispanics represented just 8 percent of the native-born workforce. For Asians, the comparable percentages were 22 percent for the foreign-born workforce and 1 percent for the native-born workforce, while for white non-Hispanics, the comparable numbers were 19 percent of the foreign-born workforce and 78 percent of the native-born workforce. The labor-force shares for black residents were closer, at 9 percent of the foreign-born workforce and 12 percent of the native-born workforce.

EXHIBIT 27

Age of foreign-born workers in the workforce, 2010



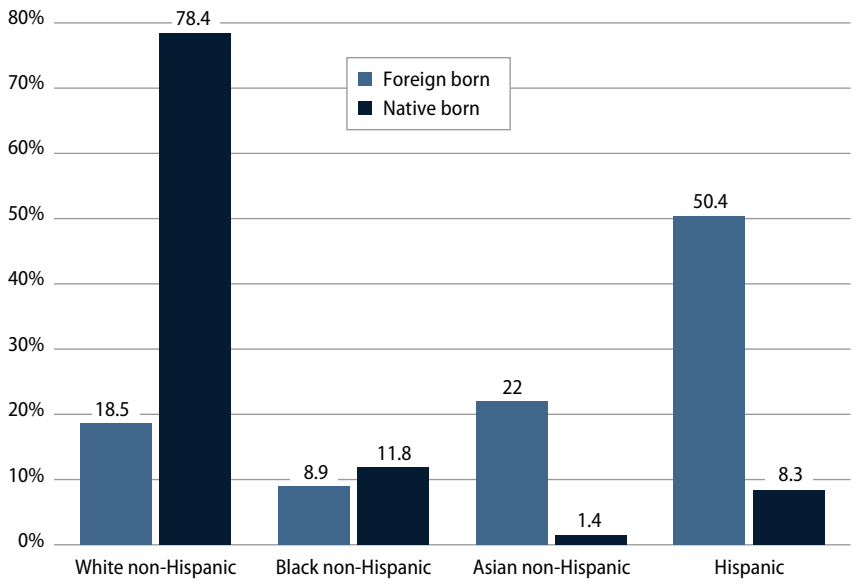
Source: U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics -- 2011," Press release, May 24, 2012, available at http://www.bls.gov/news.release/archives/forbrn_05242012.htm.

The foreign-born workforce currently has similar shares of college graduates as the native-born workforce but a much higher share of workers with less than a high school degree. As a result, the foreign-born workforce currently has a smaller share of high school graduates and workers with some college than the native-born workforce.

The occupational profiles of foreign-born and native-born workers are different. In 2010 approximately 29 percent of foreign-born workers held managerial, professional, or financial occupations, compared to 39 percent for native-born workers. In contrast, 25 percent of foreign-born workers were in service occupations, compared to 16 percent for native-born workers. Foreign-born workers held smaller shares of sales occupations compared to native-born workers but higher shares of jobs in farming and blue-collar occupational categories, including construction, installation, production, and transportation and material-moving occupations.

EXHIBIT 28

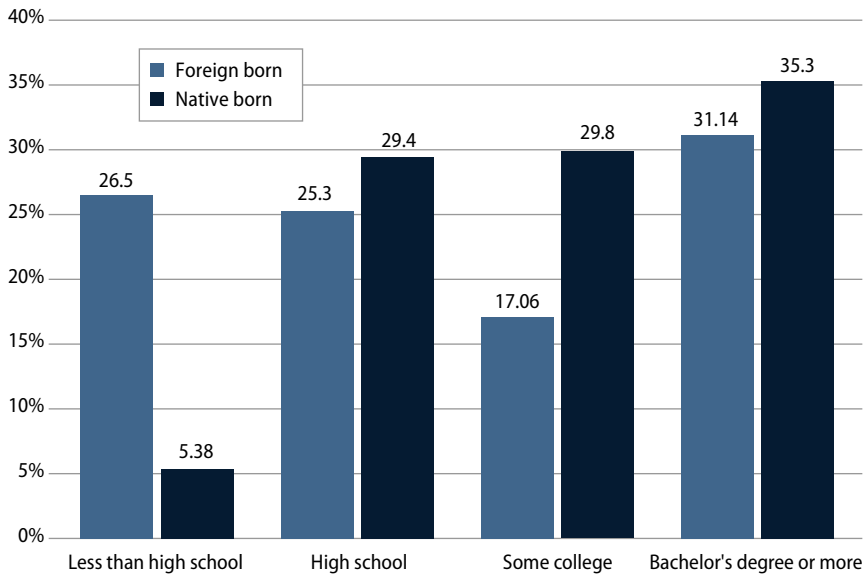
Ethnic composition of foreign-born workers in the workforce, 2010



Source: U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics -- 2011," Press release, May 24, 2012, available at http://www.bls.gov/news.release/archives/forbrn_05242012.htm.

EXHIBIT 29

Education of foreign- born workers in the workforce, 2010



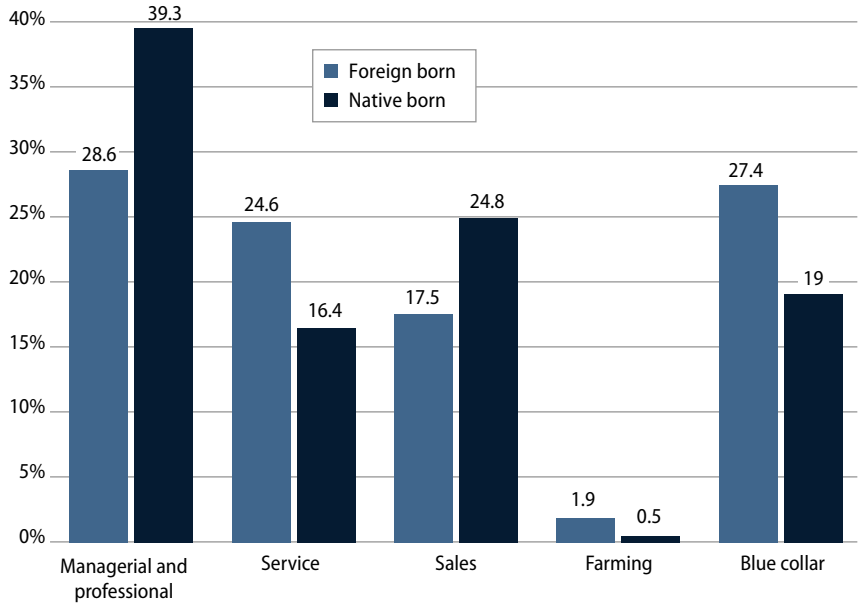
Source: U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics -- 2011," Press release, May 24, 2012, available at http://www.bls.gov/news.release/archives/forbrn_05242012.htm.

Within the broad services category, foreign-born workers have a higher share of food-service occupations (7.9 percent to 5.1 percent) and building-maintenance occupations (8.8 percent to 3 percent) compared to native-born workers.

The age, education, and occupational profiles of immigrants have important implications for future immigration policy. The main takeaways from this review are: that immigrants tend to be older and have more workforce experience than new entrants to the workforce; that the current immigrant workforce tends to have less education and work in lower-skilled jobs than native-born workers, although there are large differences between Hispanic and Asian foreign-born workers; and that immigrants work in a broad range of occupations in the American economy.

EXHIBIT 30

Occupational profile of foreign-born workforce, 2010



Source: U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics -- 2011," Press release, May 24, 2012, available at http://www.bls.gov/news.release/archives/forbrn_05242012.htm.

Conclusion

Over the next two decades, the nation's workforce will see unusually large changes. By 2030 nearly 83 million new workers will enter the labor force. Their skills, abilities, and productivity are needed to build a prosperous 21st century economy. Most of the new workers will replace the large numbers of Baby Boomers who will be leaving the workforce. Immigrants and their children are projected to comprise 35 percent of all new entrants to the workforce in the current decade and 40.8 percent in the next decade after 2020.

Our analysis is grounded in projections of the U.S. population that identify the population and workforce contributions of first-generation (foreign born) and second-generation (children of foreign born) residents of the United States. The projections are based on assumptions that the amount and sources of future immigration will not differ greatly from the recent past. To the extent that proposed reforms to national immigration policy would substantially change the amount or sources of future immigration, the projections provide a benchmark against which to judge the impacts of such changes.

We project the number of workers by combining rates of labor-force participation projected by the Bureau of Labor Statistics with our population projections. Our aim has been to make the sources of growth and change in the nation's workforce as transparent as possible.

From these projections we estimate the lifecycle flows of people into and out of the workforce. The main flows are the aging out of current members of the workforce, the maturing of children who now are in school, both native and foreign born, and the addition of immigrants who arrive as adults.

By far the largest change involves the 59.7 million workers belonging to the giant Baby Boom generation in 2010. An additional 6.9 million workers older than the Baby Boomers also were present in 2010. The great majority, 58.6 million, of these 66.6 million workers will leave the workforce and need to be replaced within

a 20-year period, a much larger number (by 38.6 percent) than the 42.1 million people who left the workforce in the previous 20 years, from 1990 to 2010. This increase in replacements would be even greater except for the steadily increased delay in retirement that we project.

In addition to the 58.6 million new workers who will replace those leaving the workforce, the nation will add 24.2 million new workers by 2030 as the labor force grows.

Without immigrants and their children, the native-born population would not be sufficient to replace the number of workers who will retire from the labor force from 2010 to 2030 or to provide for any increase. Our projections indicate that 51.3 million workers who are native born and not of immigrant parents are likely to enter the workforce in this period, 7.3 million short of the total number of workers who will be leaving the workforce.

The role of immigrants and their native-born children in the net growth of the workforce is shown in Conclusion Chart 1. Over the 20 years from 2010 to 2030, the number of first-generation workers (foreign born) will increase by 9.9 million, while the number of their second-generation children (native born) in the workforce will increase by 10.5 million. Only a fraction (16.1 percent, or 3.9 million) of the projected increase in the total labor force stems from growth in the number of third-generation native-born workers. (see Conclusion Chart 2)

As we approach 2030, virtually all of the net growth will be coming from immigrants and their children. In fact, the largest component of the growth in the labor force (43.2 percent) will come from native-born children of immigrants who have not yet reached working age, with another 40.5 percent coming from immigrants.

The retirement of the Baby Boom generation and their replacement will be a major workforce and economic challenge facing the nation from now to 2030. We estimate[24] that 73 percent of all job openings in 2020 to 2030 will result from the retirement or departure of workers from the labor force, up from 57 percent of job openings in the current decade.

Just to maintain current production of goods and services, large needs for replacement workers are projected in the major occupations where the Baby Boomers are currently employed. Large numbers of openings will occur even in sectors that are not expected to grow in total size of the workforce. Immigrants already fill more than 10 percent of the jobs in every major occupational sector, including

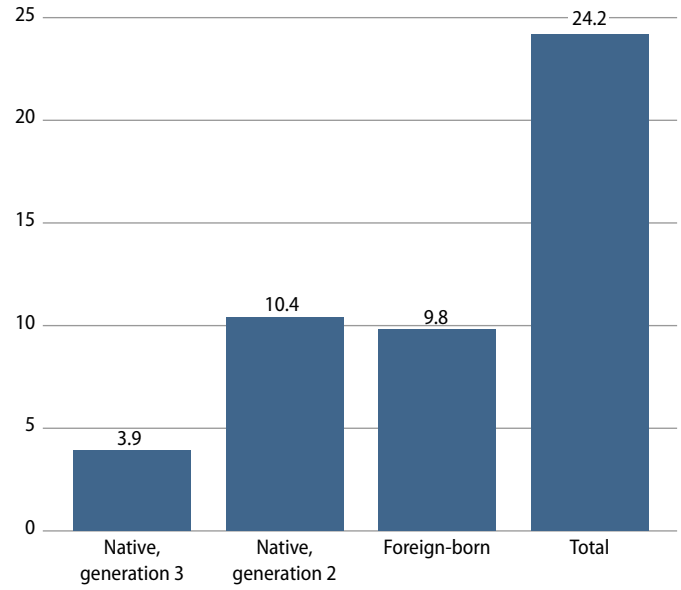
more than one in eight in agriculture, construction, production, service, professional, and sales occupations.

The nation will need new workers at all skill levels. The loss of so many experienced workers when the Baby Boomers retire, however, means that workforce development has become a high priority for a range of public policies, including immigration, as well as the education of young workers and training to help existing workers move up the skill ladder. These workforce challenges should be high-priority considerations in deliberations over both immigration reform and education and training policies.

We hope that the findings offered in this report make clear that the contributions of immigrants and their children will be needed for the nation to build a 21st century economy, both by helping the nation adjust to the massive wave of Baby Boomer retirements and also to sustain long-term economic growth.

EXHIBIT CONCLUSION 1

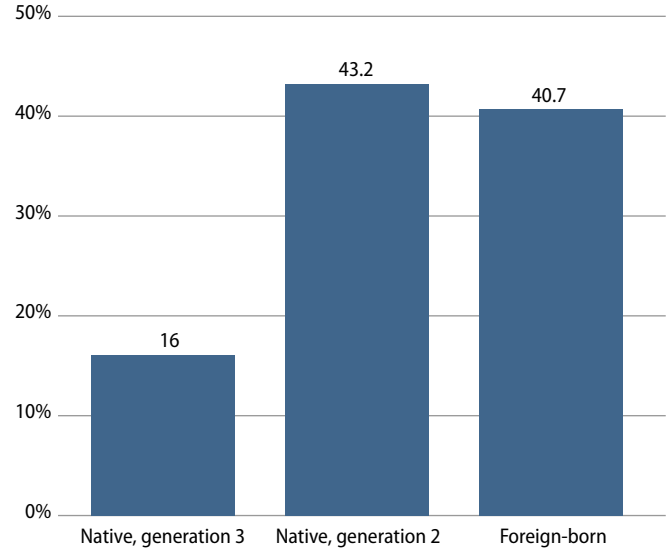
Growth in U.S. labor force by nativity, 2010 to 2030



Source: Calculated from Pitkin-Myers workforce projections

EXHIBIT CONCLUSION 2

Share of U.S. labor-force growth by nativity, 2010 to 2030



Source: Calculated from Pitkin-Myers workforce projections.

Technical appendix

Reconciling major data sources

Population projections

The Pitkin-Myers 2011 generational population projections provide the base upon which the workforce projections are estimated. Our 2011 population projections have been revised for this study to take into account two more years of observations of the amount and sources of immigration. The 2011 series assumes that the distribution of migrant origins converges to the mean distribution of all foreign-born movers from abroad (in the previous year) in the 2001 to 2009 American Community Surveys, or ACS. This target distribution implies a substantial rebound in the share of Hispanic immigrants from the post-2006 distribution. This assumption is consistent with the notion that migration from Latin America is pro-cyclical. Two later rounds of the ACS in 2010 and 2011, however, show a continued shift in the origin of immigrants toward higher numbers from Asian origins. The 2013 revision of the Pitkin-Myers 2011 projections maintains the original total numbers of immigrants in each year while increasing the number of new Asian immigrants at the same pace as the observed 2006 to 2011 rate through 2015, and compensating reductions are made in the number of immigrants from Mexico and Central America. Thereafter, the number of new Asian immigrants increases at the same rate as total immigration.

The Pitkin-Myers 2011 and 2013 series project a higher population for the next two decades than the latest 2012 Census Bureau population projections. When first published, the Pitkin-Myers population projections were substantially *lower* than the Census Bureau projections prevailing at that time. The current difference with the Census Bureau projections is mainly attributable to the assumption of higher immigration in Pitkin-Myers 2013 by nearly 300,000 per year in the current decade. (see technical appendix Exhibit 1) In addition, natural increase is greater in Pitkin-Myers 2011 and 2013 than in Census Bureau 2012 due to predicted births to the larger projected population of foreign-born women; the

difference in projected births is 187,000 in 2020 and increases in later years. These births have negligible impact on the population of working-age immigrants until after 2030. For 2030 the Pitkin-Myers 2013 projected total population is above the Census Bureau's projection by 7.43 million, or 2.1 percent.

It should be noted that race is defined differently for the non-Hispanic population in the two projection series. Whereas the Pitkin-Myers model projects non-Hispanic persons in four mutually exclusive race groups—white, black, American Indian or Alaska Native, and Asian or Pacific Islander[25]—the U.S. Census Bureau projects non-Hispanic persons of a single race in each of these races and also separately projects those reporting more than one race. The race categories in the Pitkin-Myers projections are modeled based on the bridged race populations developed by the National Center for Health Statistics for the 2010 Census.[26]

The two projection series for age and race-Hispanic origin groups are compared in technical appendix Exhibit 2. The columns show the ratios of the Pitkin-Myers populations to Census Bureau population—blue in 2012 and red in 2030. Non-Hispanic, multiracial persons are assigned to race groups in the Pitkin-Myers projections but are not shown for the Census Bureau projection.[27] The effects of the differences in race classification can be seen in the blue columns for 2012, which are larger for children under age 18 than the older population and larger for blacks and Asians than they are for whites. The red columns for 2030 show the combined effects of differences in classification, immigration assumptions, and projected births for children. For the population in prime working age, 18 to 64, the differences between Pitkin-Myers and the Census Bureau are relatively small: 2.3 percent for the total population and 8.3 percent—the highest of any group—for the Hispanic population in the age range due to the higher assumptions of future total immigration and of the share of immigrants who will be Hispanic.

It is an open question whether the decline in immigration that began in 2008 marks a turning point or is a temporary slowdown. The Pitkin-Myers projection implies that the sharp drop in immigration in recent years will be temporary and will be followed by substantial but not complete recovery to prerecession levels by 2015. The revival of prospects for comprehensive immigration reform since 2011 when the Pitkin-Myers projections were developed lends further credence to the assumptions about future increases in immigration. In addition, it would be unwise to assume depressed levels of immigration will continue during decades when retirement of workers in the large Baby Boomer generation will raise demand for replacement workers.

Labor-force participation rates

The labor-force participation rates, or LFPRs, used in this study are consistent with those used in Toossi's 2009 and 2012[28] projections of the labor force for the U.S. Bureau of Labor Statistics. This appendix compares our LFPRs with Toossi's in detail. The different series of estimated and projected rates are shown in technical appendix Exhibit 3.[29]

For 2010 we use the average of the 12 monthly 2010 Current Population Surveys for population groups defined by sex, race and Hispanic origin, age, and immigrant generation—foreign born; native born of foreign-born mother, or second generation; and native born of native-born mother, or third generation. For all age groups, these rates are applied to the 2010 Census population counts by sex, race and Hispanic origin, and age, supplemented with nativity estimates from the 2010 American Community Survey and immigrant-generation estimates from the Pitkin-Myers population projection model. Our rates cannot all be compared to Toossi's rates because the latter do not break out separate rates by nativity.[30] Our rates are accordingly reported with the immigrant dimension collapsed and compared to Toossi's on that basis. These rates are shown in the first column of Exhibit 3. Toossi's 2010 observed rates are shown in the fourth column; for reference, the fifth column shows the 2012 estimates reported by Toossi. The differences between the two estimates for 2010 are trivial.

In the our projections for 2020 and 2030, the 2010 CPS rates are held constant for those up to age 55. Because of the differences between immigrant generations in certain sex-age-race and Hispanic origin groups, projected changes in the nativity mix lead to overall net changes in the LFPRs for these groups. For all Hispanic women ages 30 to 34, for which the native-born share is projected to increase, for example, the labor-force participation rate increases from 65 percent in 2010 to 68.6 percent in 2030. By contrast, the rate for non-Hispanic white males of the same age, for which the nativity mix is stable, is projected to be the same in 2030 as in 2010. (see the second and third columns in appendix Table 2) By comparison, Toossi's rates for some groups in this age range rise to 99.7 percent, for example, for non-Hispanic white men ages 30 to 34, and fall for others, to 47.3 percent, for example, for 20- to 24-year-old Asian men. (see the last column in Exhibit 3)

At ages 55 and older, in this study we use the most recent available BLS rates, Toossi 2012 for 2020, and Toossi 2009 for 2030,[31] and apply them to all three immigrant generations in the corresponding age-sex-race and Hispanic groups.

In this age range, the rates in the Pitkin-Myers-Levy and Toossi series for 2020 and 2030 are equal, as can be seen by comparing the two columns for each date in Exhibit 3. These projections imply substantial delays in retirement, as indicated by the 2010 to 2030 increases in LFPRs at ages 60 to 64 for most race-sex classes.

Projections and estimates of the workforce

The future workforce in 2020 or 2030 is projected by multiplying the projected LFPR times the population in each age-sex-race-Hispanic-generation category and summing over all the categories.

For past years the estimates are made by combining data from different sources to ensure maximum comparability among the estimates and projections.

For 2010 the estimates of the April 1 Census *population* by age, bridged race, Hispanic origin, and sex[32] are combined with estimates of *nativity* within each population class from the 2010 American Community Survey and *native-born generation* within population classes for birth cohorts from the March 2000 CPS Annual Social and Economic Supplement. *LFPRs* for the detailed population classes are the averages of the monthly CPS surveys in 2010.

For 2000 the estimates of the April 1 Census *population* by age, bridged race, Hispanic origin, and sex[33] are combined with estimates of *nativity* within each population class from the 2000 Census (5 percent Public Use Microdata Sample) and *native-born generation* within population classes from the March 2000 CPS Annual Social and Economic Supplement. *LFPRs* for the detailed population classes are the averages of the monthly CPS surveys in 2000.

For 1990 the Census counts of the April 1 *population* by age, race, Hispanic origin, sex, and nativity (5 percent Public Use Microdata Sample) are combined with estimates of *native-born generation* within native-born birth cohorts from the March 2000 CPS Annual Social and Economic Supplement. *LFPRs* for the detailed population classes are from the 1990 Census (5 percent Public Use Microdata Sample).

References

National Center for Health Statistics. 2003. Estimates of the April 1, 2000, United States resident population by age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. http://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#april2000.

National Center for Health Statistics. 2011. Estimates of the April 1, 2010, United States resident population by age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. http://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#april2010.

TECHNICAL APPENDIX EXHIBIT 1

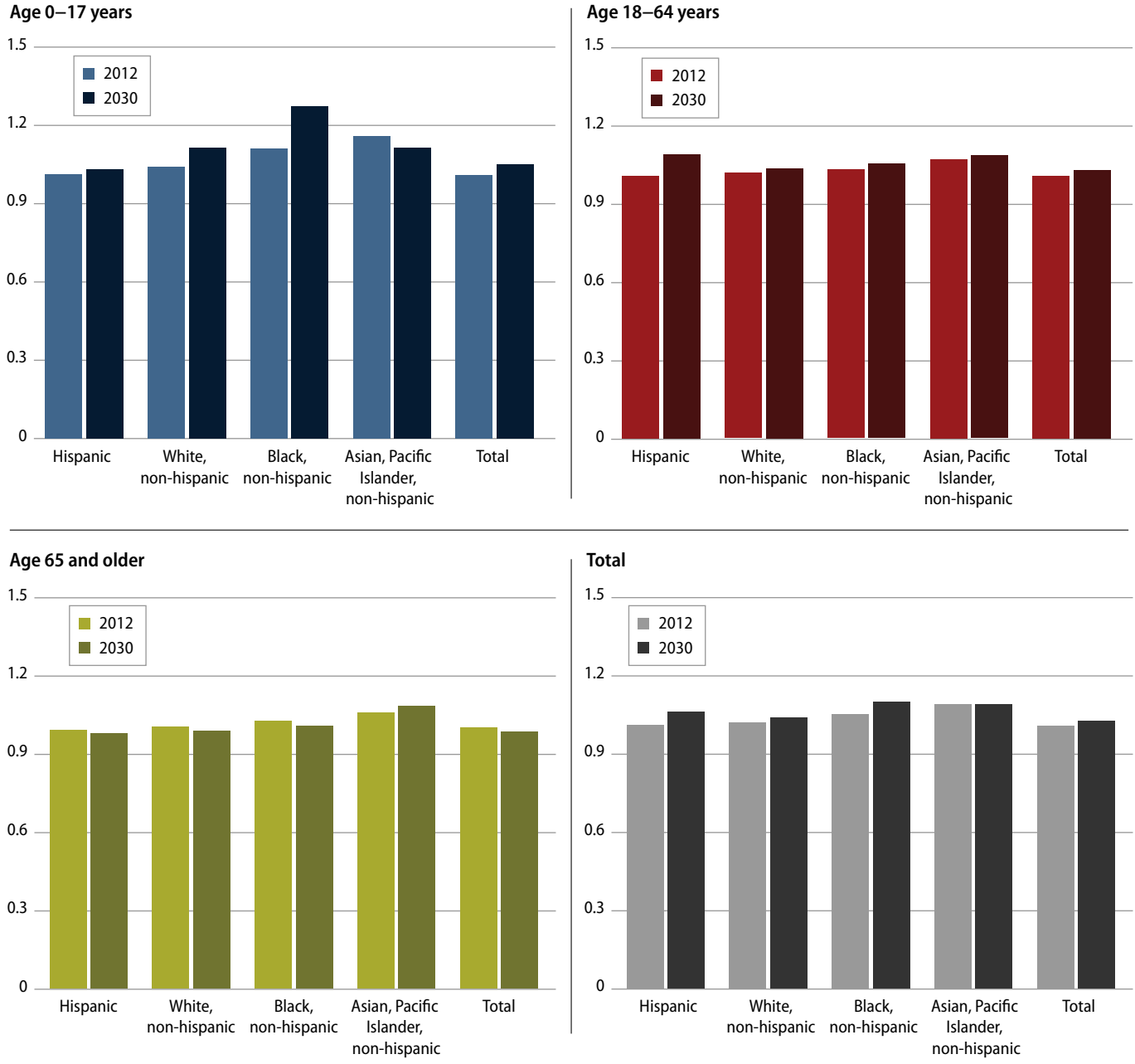
Benchmarks comparing Pitkin-Myers 2013 and 2012 Census Bureau population projections of the United States

	Population (July 1)		Natural Increase		Net International Migration									
					Total		Non Hispanic White*		Non Hispanic Black*		Non Hispanic Asian* †		Hispanic	
	Pitkin-Myers	Census Bureau	Pitkin-Myers	Census Bureau	Pitkin-Myers	Census Bureau	Pitkin-Myers	Census Bureau	Pitkin-Myers	Census Bureau	Pitkin-Myers	Census Bureau	Pitkin-Myers	Census Bureau
Year	(1000s)		(1000s)		(1000s)		Percent		Percent		Percent		Percent	
2012	314,745	314,004	1,723	1,688	1,017	725	16.7	15.7	9.3	10.1	31.5	33.2	42.3	40.0
2020	337,963	333,896	1,799	1,612	1,200	909	16.0	15.9	8.8	11.4	28.6	29.4	46.6	42.3
2030	367,162	358,471	1,583	1,225	1,223	1,139	15.9	16.1	8.7	12.4	28.4	26.3	47.0	44.2

Source: Pitkin-Myers population projections; U.S. Census Bureau, *Methodology and Assumptions for the 2012 National Projections* (U.S. Department of Commerce, 2012).

TECHNICAL APPENDIX EXHIBIT 2

Ratio of Pitkin-Myers 2013 to Census Bureau 2012 population projections, 2012 and 2030



Source: 1990 Census; 2010 American Community Survey.

TECHNICAL APPENDIX EXHIBIT 3

Summary and comparison of projected labor-force participation rates by age and sex, 2010 to 2030

Race, Origin, Sex	Age	P-M-L			Toossi			
Male		Observed	Projection		Observed		Projection (2011)	Projection (2009)
		2010	2020	2030	2010	2011	2020	2030
Hispanic	16 to 19	35.0	34.4	34.3	33.2	30.1	28.6	34.4
	20 to 24	81.0	80.1	79.4	80.0	79.5	75.4	81.3
	25 to 29	91.7	91.2	91.1	91.9	90.7	91.5	94.5
	30 to 34	93.5	93.2	93.1	93.5	92.5	94.1	97.3
	35 to 39	93.8	93.4	92.9	94.1	93.4	95.5	97.1
	40 to 44	90.9	90.8	90.1	91.5	91.3	92.4	96.7
	45 to 49	88.6	88.9	88.6	88.6	88.2	90.1	93.9
	50 to 54	86.7	87.3	87.4	86.7	86.1	88.5	85.3
	55 to 59	76.7	75.6	72.5	77.1	78.2	75.6	72.5
	60 to 64	58.6	63.7	72.5	57.8	59.0	63.2	72.5
	65 to 69	38.7	42.5	43.7	38.7	35.1	42.5	43.7
	70 to 74	22.9	30.5	38.1	23.4	26.3	30.5	38.1
	75 to 79	12.4	18.7	24.8	12.4	16.5	18.7	24.8
	80 or more	9.6	20.3	17.4	9.5	8.4	20.3	17.4
White, Non-Hispanic	16 to 19	39.5	39.2	39.1	38.7	38.1	32.5	35.0
	20 to 24	76.6	76.4	76.1	76.1	76.2	71.9	72.6
	25 to 29	89.4	89.4	89.2	89.4	88.7	81.6	99.0
	30 to 34	92.0	92.0	92.0	91.8	91.7	90.5	99.7
	35 to 39	92.9	92.9	92.9	92.9	92.6	91.2	91.0
	40 to 44	91.5	91.5	91.5	91.6	91.5	91.4	91.0
	45 to 49	89.8	89.9	89.9	89.8	89.6	87.7	87.9
	50 to 54	86.2	86.3	86.3	86.4	85.5	85.4	84.8
	55 to 59	79.8	81.1	82.3	80.0	80.2	81.1	82.3
	60 to 64	62.0	66.6	70.3	61.6	60.4	66.6	70.3
	65 to 69	36.4	42.3	45.4	37.1	38.4	42.3	45.4
	70 to 74	23.5	28.0	24.9	22.4	23.6	28.0	24.9
	75 to 79	15.2	19.2	24.4	16.1	15.8	19.2	24.4
	80 or more	7.2	7.0	11.2	5.9	5.9	7.0	11.2

Race, Origin, Sex	Age	P-M-L			Toossi			
Male (continued)		Observed	Projection		Observed		Projection (2011)	Projection (2009)
		2010	2020	2030	2010	2011	2020	2030
Black*	16 to 19	27.2	27.1	27.1	25.8	25.7	19.3	19.7
	20 to 24	67.4	67.5	67.6	66.9	67.0	64.8	68.7
	25 to 29	82.1	82.0	81.9	82.3	81.7	80.1	79.6
	30 to 34	84.7	84.7	84.8	84.7	83.7	82.5	86.1
	35 to 39	85.9	86.1	86.1	86.8	83.7	87.6	93.1
	40 to 44	84.5	84.8	84.7	85.5	83.7	86.4	86.2
	45 to 49	80.1	80.4	80.2	79.6	78.2	78.7	80.1
	50 to 54	75.6	75.8	76.1	75.1	73.9	74.9	76.8
	55 to 59	65.3	63.6	62.7	65.2	63.0	63.6	62.7
	60 to 64	47.4	47.0	43.6	46.7	47.2	46.7	43.5
	65 to 69	28.1	31.5	34.1	27.9	27.3	31.5	34.1
	70 to 74	16.8	20.2	24.2	16.3	20.1	20.2	24.2
	75 to 79	11.1	14.4	15.7	12.1	12.2	14.4	15.7
	80 or more	7.6	9.2	13.3	6.5	7.3	9.2	13.3
Asian†	16 to 19	22.8	22.1	22.5	22.1	20.1	14.1	14.5
	20 to 24	57.2	57.0	56.7	56.3	57.1	48.2	47.3
	25 to 29	80.4	80.6	80.7	80.5	82.9	79.5	85.7
	30 to 34	89.5	89.3	89.2	89.8	91.2	90.8	95.5
	35 to 39	91.3	91.2	91.2	91.1	92.2	92.2	96.6
	40 to 44	91.7	91.6	91.4	91.8	92.0	92.7	98.2
	45 to 49	93.5	93.6	93.4	93.6	92.7	95.1	95.9
	50 to 54	89.0	89.1	88.7	88.7	89.9	90.5	94.5
	55 to 59	87.7	89.1	88.3	87.4	84.0	89.1	88.3
	60 to 64	66.7	70.2	75.3	66.8	64.2	70.3	75.3
	65 to 69	42.7	47.0	46.7	42.9	44.0	47.0	46.7
	70 to 74	24.2	23.9	17.1	22.1	25.4	23.9	17.1
	75 to 79	11.6	20.1	24.1	13.3	13.2	20.1	24.1
	80 or more	4.9	3.5	5.3	4.8	4.3	3.5	5.3

Race, Origin, Sex	Age	P-M-L			Toossi			
Female		Observed	Projection		Observed		Projection (2011)	Projection (2009)
		2010	2020	2030	2010	2011	2020	2030
Hispanic	16 to 19	29.8	29.9	30.0	28.5	26.3	21.9	28.7
	20 to 24	62.0	62.5	63.1	61.6	63.0	59.7	63.2
	25 to 29	67.7	70.0	71.2	67.7	65.4	71.7	66.4
	30 to 34	65.0	67.2	68.6	64.9	63.7	62.9	64.9
	35 to 39	67.2	68.3	69.6	66.7	66.2	66.4	66.9
	40 to 44	69.8	70.3	71.2	69.3	68.1	64.9	69.9
	45 to 49	72.6	72.7	73.6	72.2	72.2	75.8	76.6
	50 to 54	68.1	68.1	68.2	67.7	68.3	70.7	74.3
	55 to 59	60.4	70.4	75.7	60.5	58.5	70.4	75.7
	60 to 64	45.0	50.3	50.8	44.5	44.9	50.0	50.8
	65 to 69	24.7	34.9	37.4	24.3	25.2	34.9	37.4
	70 to 74	10.5	14.5	20.7	10.4	11.6	14.5	20.7
	75 to 79	7.1	7.4	9.0	7.4	7.0	7.4	9.0
	80 or more	4.3	7.6	6.4	4.5	4.0	7.6	6.4
White, Non-Hispanic	16 to 19	41.7	41.3	41.2	40.9	40.9	30.5	32.7
	20 to 24	71.7	71.6	71.4	71.9	70.9	70.5	65.7
	25 to 29	78.4	78.4	78.2	78.4	77.7	77.5	78.3
	30 to 34	76.2	76.2	76.1	76.0	76.0	76.2	75.0
	35 to 39	75.9	75.9	75.8	75.7	75.0	74.0	71.5
	40 to 44	78.0	77.9	77.9	77.7	77.3	77.3	75.7
	45 to 49	78.3	78.3	78.3	78.2	78.0	76.2	76.0
	50 to 54	76.4	76.4	76.3	76.3	76.0	78.0	82.3
	55 to 59	70.4	76.6	81.2	70.5	69.9	76.6	81.2
	60 to 64	52.5	61.9	69.0	52.5	52.3	61.8	69.2
	65 to 69	28.1	35.7	42.4	27.9	28.0	35.7	42.4
	70 to 74	15.8	19.7	22.4	15.5	15.3	19.7	22.4
	75 to 79	8.7	14.1	16.9	9.2	9.1	14.1	16.9
	80 or more	3.4	2.6	4.2	2.2	2.4	2.6	4.2

Race, Origin, Sex	Age	P-M-L			Toossi			
Female (continued)		Observed	Projection		Observed		Projection (2011)	Projection (2009)
		2010	2020	2030	2010	2011	2020	2030
Black*	16 to 19	26.2	26.2	26.2	25.1	24.2	18.5	21.4
	20 to 24	68.8	68.8	68.9	66.9	65.9	62.4	59.2
	25 to 29	75.7	75.7	75.8	76.7	75.1	73.8	80.9
	30 to 34	79.2	79.3	79.5	79.3	76.9	77.7	80.7
	35 to 39	79.3	79.5	79.6	78.2	79.0	77.2	83.0
	40 to 44	77.4	77.5	77.5	77.1	77.4	77.6	83.0
	45 to 49	75.2	75.5	75.4	75.3	73.9	75.1	78.2
	50 to 54	70.8	71.0	71.2	70.6	70.0	69.9	72.3
	55 to 59	64.3	67.3	73.5	63.6	62.4	67.3	73.5
	60 to 64	44.2	49.3	60.3	44.2	42.8	49.0	60.6
	65 to 69	24.4	30.9	37.5	24.2	26.5	30.9	37.5
	70 to 74	13.1	17.6	21.3	13.0	13.7	17.6	21.3
	75 to 79	7.9	9.1	11.9	7.6	6.8	9.1	11.9
	80 or more	4.3	5.9	6.0	4.2	3.9	5.9	6.0
Asian†	16 to 19	23.6	23.5	23.7	22.0	23.4	13.5	10.2
	20 to 24	51.5	51.6	51.9	50.9	53.2	42.8	50.0
	25 to 29	66.2	67.5	68.7	65.7	64.7	64.8	67.2
	30 to 34	67.4	69.0	69.4	66.0	65.4	67.9	74.1
	35 to 39	71.5	72.7	73.2	71.4	70.8	72.5	73.4
	40 to 44	74.6	74.9	75.3	74.2	72.6	73.9	72.0
	45 to 49	75.6	75.8	76.1	75.7	73.9	76.8	79.9
	50 to 54	77.0	76.9	75.9	75.9	77.0	79.8	82.8
	55 to 59	65.1	73.7	84.3	65.0	67.0	73.7	84.3
	60 to 64	50.4	54.2	69.1	49.3	49.5	54.1	69.2
	65 to 69	21.6	29.5	44.3	21.4	22.8	29.5	44.3
	70 to 74	13.0	20.3	22.2	13.8	10.5	20.3	22.2
	75 to 79	4.3	5.8	7.8	4.4	6.4	5.8	7.8
	80 or more	4.2	6.8	6.5	4.4	2.8	6.8	6.5

* Toossi includes Black Hispanic.
† P-M-L includes Pacific Islanders.
Source: Annual average from 2010 Current Population Survey; Toossi (2009, 2012). See text.

Appendix table

Labor-force and net entrants to and exits from the labor force by decade, observed and projected, 1990 to 2030

Labor Force, 1990				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Hispanic	4,149,000	1,013,000	4,824,000	9,985,000
Non Hispanic White	88,298,000	4,640,000	3,201,000	96,140,000
Non Hispanic Black	11,894,000	115,000	820,000	12,829,000
Native American	757,000	14,000	15,000	787,000
Asian, Pac.Islander	527,000	305,000	2,661,000	3,494,000
Total	**105,626,000**	**6,088,000**	**11,522,000**	**123,236,000**

Cohort Entrants and Exits to/from Labor Force, 1990-2000				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Entrants				
Hispanic	1,921,000	1,055,000	4,100,000	7,077,000
Non Hispanic White	20,503,000	663,000	1,506,000	22,671,000
Non Hispanic Black	3,562,000	133,000	588,000	4,282,000
Native American	316,000	6,000	7,000	329,000
Asian, Pac.Islander	191,000	354,000	2,243,000	2,788,000
Total	**26,492,000**	**2,212,000**	**8,443,000**	**37,147,000**
Exits				
Hispanic	-411,000	-129,000	-391,000	-932,000
Non Hispanic White	-12,823,000	-1,400,000	-596,000	-14,818,000
Non Hispanic Black	-2,511,000	-17,000	-75,000	-2,603,000
Native American	-77,000	-3,000	-4,000	-84,000
Asian, Pac.Islander	-60,000	-49,000	-234,000	-343,000
Total	**-15,883,000**	**-1,598,000**	**-1,299,000**	**-18,780,000**
Net Entrants or (Exits)				
Hispanic	1,510,000	926,000	3,709,000	6,145,000
Non Hispanic White	7,680,000	(737,000)	910,000	7,853,000
Non Hispanic Black	1,051,000	116,000	513,000	1,680,000
Native American	238,000	3,000	3,000	245,000
Asian, Pac.Islander	130,000	306,000	2,009,000	2,445,000
Total	**10,609,000**	**614,000**	**7,144,000**	**18,367,000**

Labor Force, 2000				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Hispanic	5,658,000	1,939,000	8,533,000	16,130,000
Non Hispanic White	95,979,000	3,903,000	4,111,000	103,993,000
Non Hispanic Black	12,945,000	232,000	1,333,000	14,509,000
Native American	996,000	18,000	19,000	1,032,000
Asian, Pac.Islander	658,000	611,000	4,670,000	5,939,000
Total	**116,235,000**	**6,702,000**	**18,666,000**	**141,603,000**

Cohort Entrants and Exits to/from Labor Force, 2000-2010				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Entrants				
Hispanic	2,085,000	1,762,000	4,649,000	8,495,000
Non Hispanic White	17,193,000	629,000	1,368,000	19,191,000
Non Hispanic Black	4,054,000	212,000	734,000	5,000,000
Native American	255,000	11,000	15,000	281,000
Asian, Pac.Islander	238,000	576,000	2,064,000	2,878,000
Total	**23,826,000**	**3,190,000**	**8,830,000**	**35,846,000**
Exits				
Hispanic	-649,000	-93,000	-574,000	-1,316,000
Non Hispanic White	-17,456,000	-1,043,000	-822,000	-19,322,000
Non Hispanic Black	-1,882,000	-11,000	-76,000	-1,969,000
Native American	-174,000	-3,000	-1,000	-178,000
Asian, Pac.Islander	-65,000	-37,000	-472,000	-574,000
Total	**-20,226,000**	**-1,187,000**	**-1,946,000**	**-23,359,000**
Net Entrants or (Exits)				
Hispanic	1,435,000	1,669,000	4,075,000	7,179,000
Non Hispanic White	(262,000)	(414,000)	546,000	(131,000)
Non Hispanic Black	2,172,000	201,000	658,000	3,031,000
Native American	81,000	8,000	14,000	103,000
Asian, Pac.Islander	173,000	539,000	1,592,000	2,304,000
Total	**3,600,000**	**2,003,000**	**6,885,000**	**12,487,000**

Labor Force, 2010				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Hispanic	7,094,000	3,607,000	12,608,000	23,309,000
Non Hispanic White	95,716,000	3,489,000	4,657,000	103,862,000
Non Hispanic Black	15,117,000	433,000	1,991,000	17,540,000
Native American	1,077,000	26,000	32,000	1,135,000
Asian, Pac.Islander	831,000	1,150,000	6,262,000	8,243,000
Total	**119,835,000**	**8,704,000**	**25,550,000**	**154,090,000**

Cohort Entrants and Exits to/from Labor Force, 2010-2020				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Entrants				
Hispanic	2,903,000	3,065,000	4,051,000	10,019,000
Non Hispanic White	18,269,000	889,000	1,476,000	20,634,000
Non Hispanic Black	4,284,000	354,000	769,000	5,407,000
Native American	294,000	17,000	12,000	322,000
Asian, Pac.Islander	265,000	917,000	2,473,000	3,654,000
Total	**26,015,000**	**5,240,000**	**8,781,000**	**40,036,000**
Exits				
Hispanic	-842,000	-264,000	-1,561,000	-2,667,000
Non Hispanic White	-18,158,000	-741,000	-860,000	-19,760,000
Non Hispanic Black	-2,749,000	-39,000	-422,000	-3,210,000
Native American	-225,000	-5,000	-8,000	-237,000
Asian, Pac.Islander	-131,000	-63,000	-884,000	-1,078,000
Total	**-22,106,000**	**-1,112,000**	**-3,734,000**	**-26,952,000**
Net Entrants or (Exits)				
Hispanic	2,060,000	2,800,000	2,490,000	7,351,000
Non Hispanic White	111,000	148,000	616,000	874,000
Non Hispanic Black	1,535,000	315,000	347,000	2,197,000
Native American	69,000	12,000	4,000	85,000
Asian, Pac.Islander	134,000	854,000	1,589,000	2,576,000
Total	**3,909,000**	**4,128,000**	**5,047,000**	**13,084,000**

Labor Force, 2020				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Hispanic	9,154,000	6,408,000	15,099,000	30,661,000
Non Hispanic White	95,827,000	3,636,000	5,273,000	104,737,000
Non Hispanic Black	16,652,000	747,000	2,338,000	19,737,000
Native American	1,146,000	38,000	36,000	1,220,000
Asian, Pac.Islander	965,000	2,003,000	7,851,000	10,819,000
Total	**123,744,000**	**12,832,000**	**30,597,000**	**167,174,000**

Cohort Entrants and Exits to/from Labor Force, 2020-2030				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Entrants				
Hispanic	3,743,000	4,529,000	4,544,000	12,816,000
Non Hispanic White	16,901,000	1,303,000	1,616,000	19,819,000
Non Hispanic Black	4,124,000	574,000	849,000	5,548,000
Native American	251,000	17,000	13,000	281,000
Asian, Pac.Islander	308,000	1,251,000	2,787,000	4,345,000
Total	**25,327,000**	**7,674,000**	**9,808,000**	**42,810,000**
Exits				
Hispanic	-1,161,000	-388,000	-2,224,000	-3,773,000
Non Hispanic White	-20,603,000	-763,000	-1,032,000	-22,397,000
Non Hispanic Black	-3,171,000	-73,000	-427,000	-3,671,000
Native American	-245,000	-5,000	-9,000	-258,000
Asian, Pac.Islander	-161,000	-104,000	-1,303,000	-1,568,000
Total	**-25,339,000**	**-1,332,000**	**-4,995,000**	**-31,667,000**
Net Entrants or (Exits)				
Hispanic	2,582,000	4,141,000	2,320,000	9,043,000
Non Hispanic White	(3,702,000)	540,000	584,000	(2,578,000)
Non Hispanic Black	953,000	502,000	422,000	1,877,000
Native American	6,000	13,000	4,000	23,000
Asian, Pac.Islander	147,000	1,147,000	1,483,000	2,777,000
Total	**(13,000)**	**6,343,000**	**4,813,000**	**11,143,000**

Labor Force, 2030				
	Native, Gen 3	Native, Gen 2	Foreign born	Total
Hispanic	11,737,000	10,549,000	17,418,000	39,704,000
Non Hispanic White	92,125,000	4,176,000	5,857,000	102,159,000
Non Hispanic Black	17,605,000	1,249,000	2,760,000	21,614,000
Native American	1,152,000	50,000	40,000	1,243,000
Asian, Pac.Islander	1,112,000	3,150,000	9,334,000	13,597,000
Total	**123,731,000**	**19,175,000**	**35,410,000**	**178,316,000**

Source: Pitkin-Myers workforce-projection summary: "Entrances and Exits in Labor Force Growth Each Decade, 1990 to 2030, by Race and Immigrant Generation."

About the authors

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Endnotes

1 Since March 2010 the private sector has added jobs, helping put millions of people who lost their employment during the recession back to work. Although we are still a long way from a full recovery, the unemployment rate is projected to continue to fall during the current decade. See Congressional Budget Office, "Baseline Economic Forecast—February 2013 Baseline Projections" (2013), available at http://www.cbo.gov/publication/43902.

2 John Pitkin and Dowell Myers, "Projections of the U.S. Population, 2010-2040, by Immigrant Generation and Foreign-Born Duration in the U.S." (Los Angeles: Population Dynamics Research Group, University of Southern California, 2011), available at http://www.usc.edu/schools/price/research/popdynamics/futures/2011_Pitkin-Myers_Projections-Immigrant-Generations-and-Foreign-Born.pdf.

3 Focusing on replacement workers is important because all too often studies focus only on high-growth job sectors or estimates of which industries will require a greater number of workers in the future. In reality, most job openings come from replacing existing workers (at existing levels of education, skills, and training) who retire or change jobs. It is also important to ask who can fill current workforce needs, given the high turnover that will occur in the next two decades as the Baby Boomers leave the workforce.

4 Other retirees not of the Baby Boomer era, for example, or people who die.

5 U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics—2010," Press release, May 27, 2011, available at http://www.bls.gov/news.release/archives/forbrn_05272011.pdf. Note: Limitations on the data do not allow us to extend projections by occupational sector or education/skill level past 2020.

6 Ibid.

7 This adds substantially to the generational perspective that proclaims an emerging partnership between aging Baby Boomers and immigrants who will be needed to fill economic roles, as detailed in Dowell Myers, *Immigrants and Boomers: Forging a New Social Contract for the Future of America* (New York: Russell Sage Foundation, 2007).

8 A 2005 study from the Congressional Budget Office highlighted the significant contribution that immigrants are likely to make to the U.S. labor force over coming decades, especially in light of the anticipated Baby Boomer retirements. See Nabeel A. Alsalam and Ralph E. Smith, "The Role of Immigrants in the U.S. Labor Market" (Washington: Congressional Budget Office, 2005), available at http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/68xx/doc6853/11-10-immigration.pdf.

9 Dowell Myers, *Immigrants and Boomers: Forging a New Social Contract for the Future of America* (New York: Russell Sage Foundation, 2007.

10 The Congressional Budget Office projects that the national unemployment rate will fall from 8.9 percent in 2011 and 7.9 percent in 2013 to 5.6 percent by 2017 and lower in subsequent years. See Congressional Budget Office, "Baseline Economic Forecast—February 2013 Baseline Projections."

11 The 2012 series of Census Bureau population projections (with May 2013 updates) are presented for different scenarios of high and low immigration assumptions, but immigrant detail is not provided within each projection. See U.S. Census Bureau, "Methodology and Assumptions," available at http://www.census.gov/population/projections/data/national/2012.html (last accessed May 2013).

12 The Pitkin-Myers 2011 generational population projections were updated (version 2013) with revised assumptions about the sources of migration. For details, see the technical appendix.

13 Our assumptions about future labor-force participation rates, or LFPRs, are strongly guided by the series of published studies by Mitra Toossi, who has also generously shared some detailed time series. Uncertainty in the current period of rapidly revised population projections and recovery from the Great Recession has necessitated additional assumptions on our part. LFPRs for people ages 55 and older are adopted directly from the series produced by the Bureau of Labor Statistics in 2009. See Mitra Toossi, "Labor force projections to 2018: older workers staying more active," *Monthly Labor Review* (November 2009), available at http://www.bls.gov/opub/mlr/2009/11/art3full.pdf. This anticipates substantial delays in retirement. In the case of people under age 55, however, no change in rates was assumed after 2010, and, instead, the substantial observed differences in labor-force participation by immigrant generation (foreign-born and native-born generations two and three) are maintained. At older ages, by contrast, the differences among immigrant generations are small, and the trends (delayed retirement) are much more pronounced. For details, see the technical appendix.

14 Of this number, 50.6 million were native born and 9.1 million were foreign born. We follow the common practice of classifying all members in the age group as Baby Boomers, even if foreign born, because all are subject to retirement and replacement.

15 They will leave the workforce due to retirement, disability, discouragement or other reasons, or death.

16 These retirements do not include deaths. In this chart, they are estimated solely on the basis of changes in projected rates of participation in the workforce for people still living.

17 These job replacement openings and job-growth numbers for 2020 to 2030 are the authors' calculations based on BLS data for 2010 to 2020 and the authors' projections of labor-force growth for 2020 to 2030. The projection of replacement job openings for 2020 to 2030 applies the BLS ratio of replacement jobs to the number of net exits for the 2010 to 2020 period to the authors' projection of net exits for 2020 to 2030. Job growth for 2020 to 2030 is projected by applying the unemployment rate and multiple-job-holding ratio calculated by the Bureau of Labor Statistics for 2020 to the authors' labor-force projections.

18 This scenario is illustrative, not a projection, but it is constrained to our workforce projections.

19 U.S. Bureau of Labor Statistics, "Employment and Economic Projections – 2010-20," Press release, February 1, 2012, available at http://www.bls.gov/news.release/pdf/ecopro.pdf.

20 These include native-born workers who arrive at working age, as well as earlier immigrants (as opposed to new immigrants) who enter the labor force either because they have now come of age, because of changes in family responsibilities, or because they have completed necessary training.

21 The major findings and methodology are reported in Dixie Sommers and Teresa L. Morisi, "Employment projections through the lens of education and training," *Monthly Labor Review* (April 2012), available at http://www.bls.gov/opub/mlr/2012/04/art2full.pdf.

22 The data on the characteristics of foreign-born workers are taken from U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics—2010," Press release, May 22, 2013, available at http://www.bls.gov/news.release/pdf/forbrn.pdf.

23 Jeffrey Passel and D'Vera Cohn, "A Portrait of Unauthorized Immigrants in the United States" (Washington: Pew Hispanic Center, 2009), available at http://www.pewhispanic.org/2009/04/14/a-portrait-of-unauthorized-immigrants-in-the-united-states/; Robert Lynch and Patrick Oakford, "The Economic Effects of Granting Legal Status and Citizenship to Undocumented Immigrants" (Washington: Center for American Progress, 2013), available at http://www.americanprogress.org/issues/immigration/report/2013/03/20/57351/the-economic-effects-of-granting-legal-status-and-citizenship-to-undocumented-immigrants/; Manuel Pastor and Justin Scoggins, "Citizen Gain: The Economic Benefits of Naturalization for Immigrants and the Economy" (Los Angeles: Center for the Study of Immigrant Integration, University of Southern California, 2012), available at http://csii.usc.edu/CitizenGain.html.

24 This analysis combines BLS estimates and our workforce projections.

25 The U.S. Census Bureau projects non-Hispanic persons of a single race in each of these races and separately also those reporting more than one race.

26 National Center for Health Statistics. 2011. "Estimates of the April 1, 2010 resident population of the United States, by county, single-year of age (0, 1, 2, …, 85 years and over), bridged race, Hispanic origin, and sex." Prepared under a collaborative arrangement with the U.S. Census Bureau(http://www.cdc.gov/nchs/nvss/bridged_race.htm [May 2013]).

27 The American Indian and Alaska Native, or AIAN, population is not separately shown in these figures but is included in the total population.

28 See Mitra Toossi, "Labor force projections to 2018: older workers staying more active," *Monthly Labor Review* (November 2009), available at http://www.bls.gov/opub/mlr/2009/11/art3full.pdf and Mitra Toossi, "Labor force projections to 2020: a more slowly growing workforce," *Monthly Labor Review* (January 2012), available at http://www.bls.gov/opub/mlr/2012/01/art3full.pdf.

29 Toossi's rates in both 2009 and 2012 for blacks include Hispanic blacks, while the Pitkin-Myers 2013 population projections do not; Toossi's rates are for Asians only, while the Pitkin-Myers 2013 population projections include Pacific Islanders. Toossi treats non-Hispanic persons of two or more races as a separate category, while this report proportionally assigns them to four exclusive race categories, including American Indian and Alaska Native (not shown here). Any differences in rates resulting from different race classifications are assumed to be negligible.

30 We use the same participation rates for all native born, combining the second and third generations. Based on a review of participation rates for these two groups, we concluded that any differences are so small that they can safely be ignored.

31 The more recent Toossi series (2012) holds LFPRs constant at the same level as 2020, which is inconsistent with past trends toward increasing participation at older ages. Accordingly, we elected to substitute the rates from Toossi (2009) for 2030, which allowed for further delay in retirement to occur. The assumption of continued delay is justified both by continuity with past trends and also by the logic that relative labor-force shortages expected in the 2020s should induce further delays in retirement and higher participation rates

32 National Center for Health Statistics. 2011. "Estimates of the April 1, 2010 resident population of the United States, by county, single-year of age (0, 1, 2, …, 85 years and over), bridged race, Hispanic origin, and sex." Prepared under a collaborative arrangement with the U.S. Census Bureau(http://www.cdc.gov/nchs/nvss/bridged_race.htm [May 2013]).

33 National Center for Health Statistics. 2003. Estimates of the April 1, 2000, United States resident population by age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.

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