

**WHY THE UNITED STATES STILL NEEDS  
FOREIGN-BORN WORKERS**

**BY MADELINE ZAVODNY**

**EXECUTIVE SUMMARY**

Without continued net inflows of immigrants, the U.S. working-age population will shrink over the next two decades and by 2040, the United States will have over 6 million fewer working-age people than in 2022. Announcements of high-profile layoffs and concerns about the impact of artificial intelligence (AI) obscure America's continuing need for additional workers at the top and bottom of the skill distribution. International migration is the only potential source of growth in the U.S. working-age population in the coming years.

The research involved analyzing data from the U.S. Census Bureau and the Bureau of Labor Statistics, including the Current Population Survey and the Job Openings and Labor Turnover Survey.

Technological change, including ongoing advances in generative AI, is unlikely to eliminate the need for additional workers. In the long run, technological progress raises labor demand by increasing productivity and incomes. In the short to medium run, domestic workers are unlikely to be sufficient to meet labor demand as federally funded infrastructure projects roll out and domestic semiconductor production ramps up. The U.S. will need workers with specialized skills that are in short supply and take years of education and training to acquire. Now and in the future, the U.S. will still need workers, and it risks not having enough of them, particularly those with desired skills, absent additional immigration.

International migrants were the sole source of growth in the U.S. working-age population in 2021 and 2022. Without the growth among the foreign born, the total working-age population would have fallen by almost 0.5 percent in 2021. In 2022, it would have fallen again, albeit by only 0.03 percent.

A shrinking working-age population can easily lead to economic stagnation or even falling living standards for a nation. A shrinking population means fewer people to generate new ideas that lead to technological progress and long-run growth. A shrinking population also means fewer workers to produce goods and services. When combined with an aging population that continues to demand labor-intensive goods and services, the result is likely to be price pressures and shortages. The U.S. also becomes even more vulnerable to disruptions in international trade since a shrinking working-age population may stymie attempts by companies to expand domestic production and to reshore operations from abroad.

New international migrants have played a vital role in U.S. population growth in recent decades, and their role will become even more significant in the coming years. The contribution of new international migrants to growth in the working-age population has become increasingly important since the baby boomers began to exit the labor force

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after 2010. Looking ahead, the sustained drop in the number of U.S. births and the continued exit of the baby boomers from the labor market leave new international migrants as the only way for the U.S. working-age population to continue to grow through at least 2040.

In total, foreign-born workers account for almost half of U.S. employment growth from January 2021 through May 2023. While critics may allege that international migrants take jobs away from U.S. natives, employment among prime-aged U.S.-born workers also soared during this period. In early 2023, the share of working-age U.S. natives who were employed surpassed its pre-pandemic rate and reached a 20-year high. This accords with considerable other evidence that foreign-born workers do not adversely affect U.S. natives' labor market outcomes.

The resumption of inflows from abroad as the pandemic has waned has not been enough to meet labor demand. Recently arrived working-age international migrants have flowed disproportionately into sectors and states with more demand for workers, as measured by job vacancy rates, and can account for up to one in five jobs filled between January 2021 and May 2023. Nonetheless, as of May 2023, the United States was experiencing its longest stretch of sub-4-percent unemployment since the 1960s, and almost two unfilled jobs for every unemployed person. Virtually every labor market indicator points to the need for additional workers, and these pressures will increase over time if the working-age population shrinks.

The unemployment rate and the job openings rate typically move in opposite directions. Since 2022, however, this traditional inverse relationship has not held. Instead, the job openings rate has eased downward as the unemployment rate has hovered near record lows. One potential explanation for this change from the typical inverse relationship is that the lack of available workers may be constraining employers from creating additional jobs. A similar pattern appears to have occurred in 2019, when the sub-4-percent unemployment rate coincided with a flattening of the job openings rate curve.

Labor supply has struggled to keep pace with strong demand, partly because of smaller inflows of foreign-born workers in the year before the pandemic and then a near cessation of inflows during the pandemic. As international borders reopened, international migration resumed slowly at first and then rapidly began to catch up. By late 2022, the U.S. had fully closed the pandemic-era gap in its foreign-born workforce, although it still had not fully caught up in terms of the foreign-born working-age population.

New international migrants have helped employment grow across the economy, particularly in sectors that were more desperately in need of workers. The relationship between the initial job openings rate and the inflow of recently arrived foreign-born workers is positive, indicating that recent arrivals helped fill jobs in sectors with more vacancies.

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Similarly, recently arrived foreign-born workers were particularly likely to go to states with tighter labor markets. The relationship between the initial job openings rate and the inflow of recently arrived foreign-born workers into a state is positive, indicating that recent arrivals helped fill jobs in states with more vacancies.

Absent inflows from abroad or from other states, the majority of states will see their working-age population shrink in the coming years. Projected declines in the working-age population without additional international migration are largest among people who have not completed a bachelor's degree and in the Northeast. International migrants will be particularly important to sustaining growth in those groups and areas.

Demographers have warned for years that the falling U.S. birth rate will eventually cause the nation's population to decline absent continued inflows from abroad. Population decline can easily lead to long-term economic stagnation or even contraction.

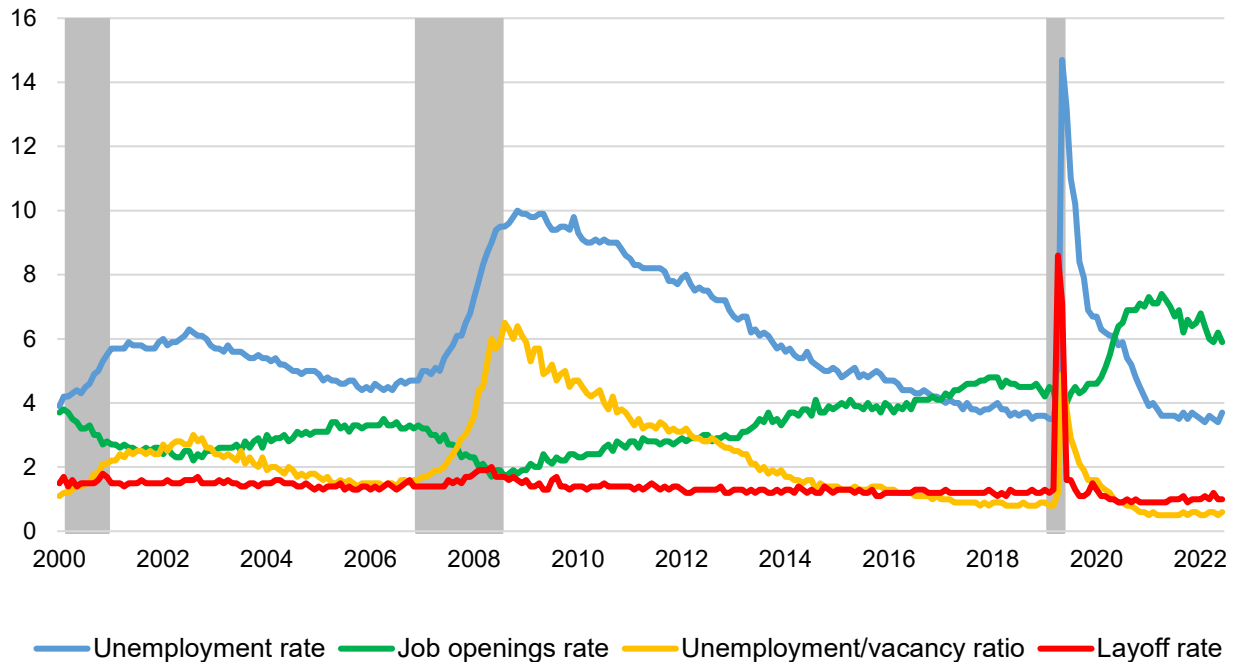
Absent continued immigration, the U.S. risks experiencing a declining working-age population soon as a consequence of the falling number of births in recent years. Indeed, the decline may have already begun.

## U.S. LABOR MARKETS REMAIN TIGHT

By virtually any measure, U.S. labor markets became extremely tight as the economy emerged from the pandemic. Although some labor market indicators have since eased a bit, the overall picture remains one of considerable strength. Figure 1 shows several labor market indicators reported by the Bureau of Labor Statistics (BLS). The unemployment rate (in blue) has been at or near record lows since mid-2021. In early 2023, it fell below 3.5 percent for the first time since the 1960s. Although the unemployment rate edged up slightly in mid-2023, the U.S. has been experiencing its longest stretch of sub-4-percent unemployment since the 1960s.

The job openings rate (in green) gives additional insight into how tight labor markets are. The job openings rate, or job vacancy rate, measures unfilled jobs as a share of filled and unfilled jobs. For a job vacancy to count in the BLS Job Openings and Labor Turnover Survey (JOLTS), the employer must be actively recruiting workers from outside the establishment to fill the position. Increases in the job openings rate indicate it is easier for workers to find jobs but harder for employers to fill them. The job openings rate began climbing in early 2021 and remains well above its pre-pandemic level. As of May 2023, about one in 17 jobs was unfilled.

**Figure 1**  
**U.S. Labor Market Indicators**



Notes: Seasonally adjusted data from the BLS for December 2000 through May 2023. Job openings and layoff rates are per 100 jobs. Recessions as declared by the National Bureau of Economic Research are in gray.

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As Figure 1 shows, the unemployment rate and the job openings rate typically move in opposite directions. Since 2022, however, this traditional inverse relationship has not held. Instead, the job openings rate has eased downward as the unemployment rate has hovered near record lows. One potential explanation for this change from the typical inverse relationship is that the lack of available workers may be constraining employers from creating additional jobs. A similar pattern appears to have occurred in 2019, when the sub-4-percent unemployment rate coincided with a flattening of the job openings rate curve.

The softening of the job openings rate over the last year coincides with a record low in the ratio of unemployed persons to job vacancies (in gold). The unemployment/vacancy ratio is another measure of how hard it is for workers to find jobs and for employers to hire workers. The lower the unemployment/vacancy ratio, the tighter the labor market. Since late 2021, the U.S. has had about two unfilled jobs for every unemployed person. The downward movement in the job openings rate since early 2022 does not appear to be a sign of broader labor market weakness – the layoff rate (in red) has remained low as job openings have eased. These measures thus point to an extremely tight labor market for the U.S. as a whole.

Tight labor markets are pervasive across industries and areas. Figure 2 shows the annual average job openings rate for each of the 10 private industry super sectors. The general upward trend in job openings since the end of the Great Recession in 2009 is clear. Remarkably, in the last two years, all 10 super sectors have hit their highest job openings rate since BLS began reporting job openings data over two decades ago. Of particular note, despite high-profile announcements of layoffs in the tech sector in recent months, JOLTS data show that the job openings rate in the professional and business services sector in the first five months of 2023 averaged well above pre-pandemic levels, while the layoff rate averaged below pre-pandemic levels.

Labor markets are tight across the country as well. As of early 2023, every state had at least as many job openings as unemployed persons, and most states had at least two job openings for every unemployed person.

Why have labor markets remained so tight as the pandemic disappears in the rearview mirror? The answer lies in both labor demand and labor supply. Labor demand has been strong as consumers unleash pent-up spending on labor-intensive services, like travel and recreation. Labor supply has struggled to keep pace, in part because of smaller inflows of foreign-born workers in the year before the pandemic and then a near cessation of inflows during the pandemic.<sup>1</sup> As international borders reopened, international migration resumed slowly at first and then rapidly

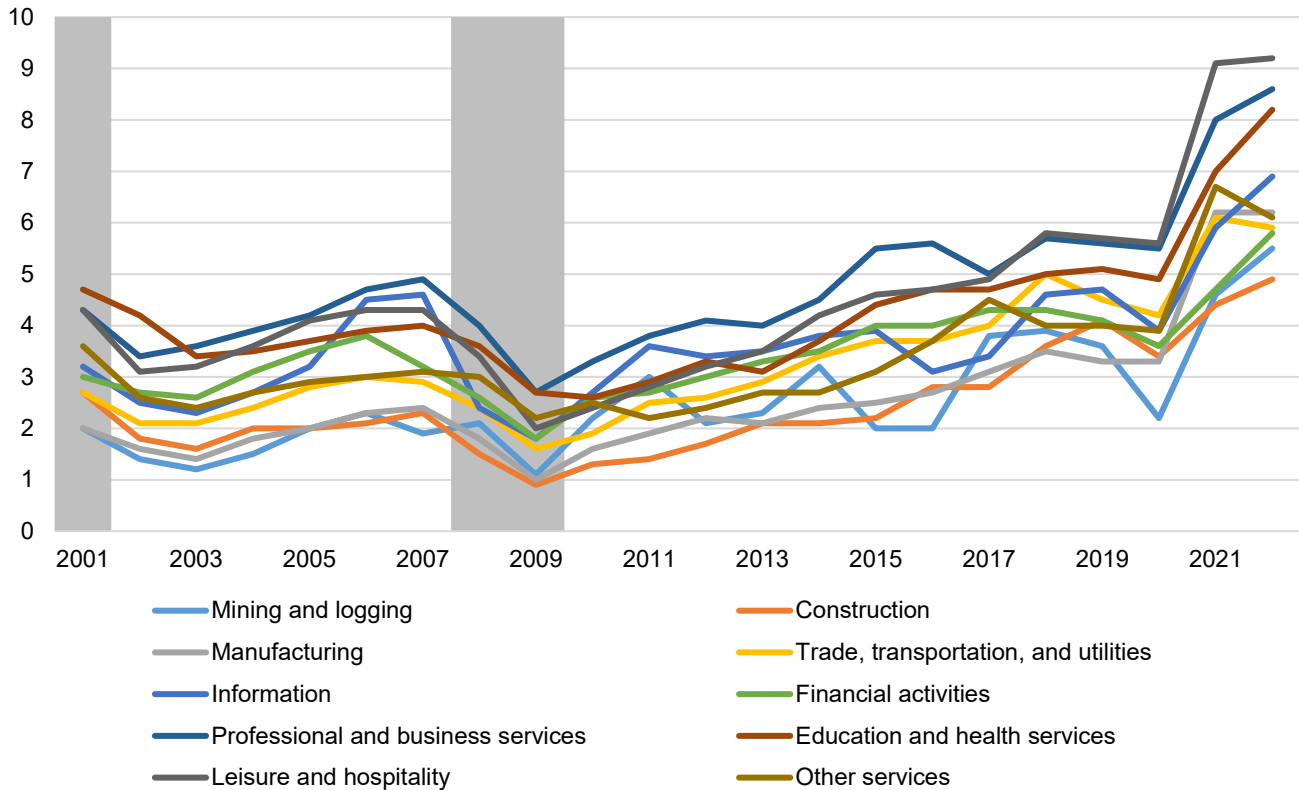
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<sup>1</sup> See Madeline Zavodny, “The Impact of the Covid-19 Drop in International Migration on the U.S. Labor Market,” NFAP Policy Brief (February 2022), <https://nfap.com/studies/the-impact-of-the-covid-19-drop-in-international-migration-on-the-u-s-labor-market/>, and Giovanni Peri and Reem Zaiour, “Labor Shortages and the Immigration Shortfall,” Econofact (January 11, 2022), <https://econofact.org/labor-shortages-and-the-immigration-shortfall>.

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began to catch up. By late 2022, the U.S. had fully closed the pandemic-era gap in its foreign-born workforce, although it still had not fully caught up in terms of the foreign-born working-age population.<sup>2</sup>

**Figure 2**  
**Job Openings Rate by Industry**



Notes: Annual averages from the BLS JOLTS database for 2001 through 2022. Job openings rates are per 100 jobs in an industry. Recessions are in gray (two-month-long recession in 2020 not shown).

**NEW INTERNATIONAL MIGRANTS, EMPLOYMENT GROWTH, AND LABOR MARKET TIGHTNESS**

New international migrants have helped meet some of the surging demand for workers as the U.S. economy emerged from the pandemic, enabling employment and output to grow faster and reducing inflation pressures. Between January 2021 and May 2023, total U.S. employment rose by about 13 million. Recently arrived

<sup>2</sup> Evgeniya A. Duzhak, “The Role of Immigration in U.S. Labor Market Tightness,” *Federal Reserve Bank of San Francisco Economic Letter* 2023-06 (February 27, 2023), <https://www.frbsf.org/economic-research/publications/economic-letter/2023/february/role-of-immigration-in-us-labor-market-tightness/>.

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international migrants accounted for up to 2.6 million – or one in five – of those additional jobs filled. Employment also rose among earlier international migrants already present in the U.S. In total, foreign-born workers account for almost half of U.S. employment growth from January 2021 through May 2023.

While critics may allege that international migrants take jobs away from U.S. natives, employment among prime-aged U.S.-born workers also soared during this period. In early 2023, the share of working-age U.S. natives who were employed not only surpassed its pre-pandemic rate but reached a 20-year high.<sup>3</sup> This accords with considerable other evidence that foreign-born workers do not adversely affect U.S. natives' labor market outcomes.<sup>4</sup>

New international migrants have helped employment grow across the economy, particularly in sectors that were more desperately in need of workers. Figure 3 shows the job openings rate for 16 major sectors (a slightly more disaggregated level than in Figure 2) in January 2021 and the inflow of recently arrived foreign-born workers into each sector between January 2022 and May 2023.<sup>5</sup> The relationship between the initial job openings rate and the inflow of recently arrived foreign-born workers is positive, indicating that recent arrivals helped fill jobs in sectors that had more vacancies.<sup>6</sup> The notable outlier in Figure 3 is the construction sector, which disproportionately attracted recent arrivals despite its relatively low job openings rate. Although arguably not necessary to alleviate labor shortages, the disproportionate number of recently arrived foreign-born workers going into construction may have helped keep housing shortages and price pressures from being even worse in that key sector.

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<sup>3</sup> Calculations are based on the Current Population Survey (CPS). Recently arrived international migrants are those who said they entered the U.S. in 2020 or later, the most recent entry window available in the CPS. The employment rate among working-age (ages 18-64) U.S. natives is averaged across the first 5 months of each year to avoid seasonal fluctuations.

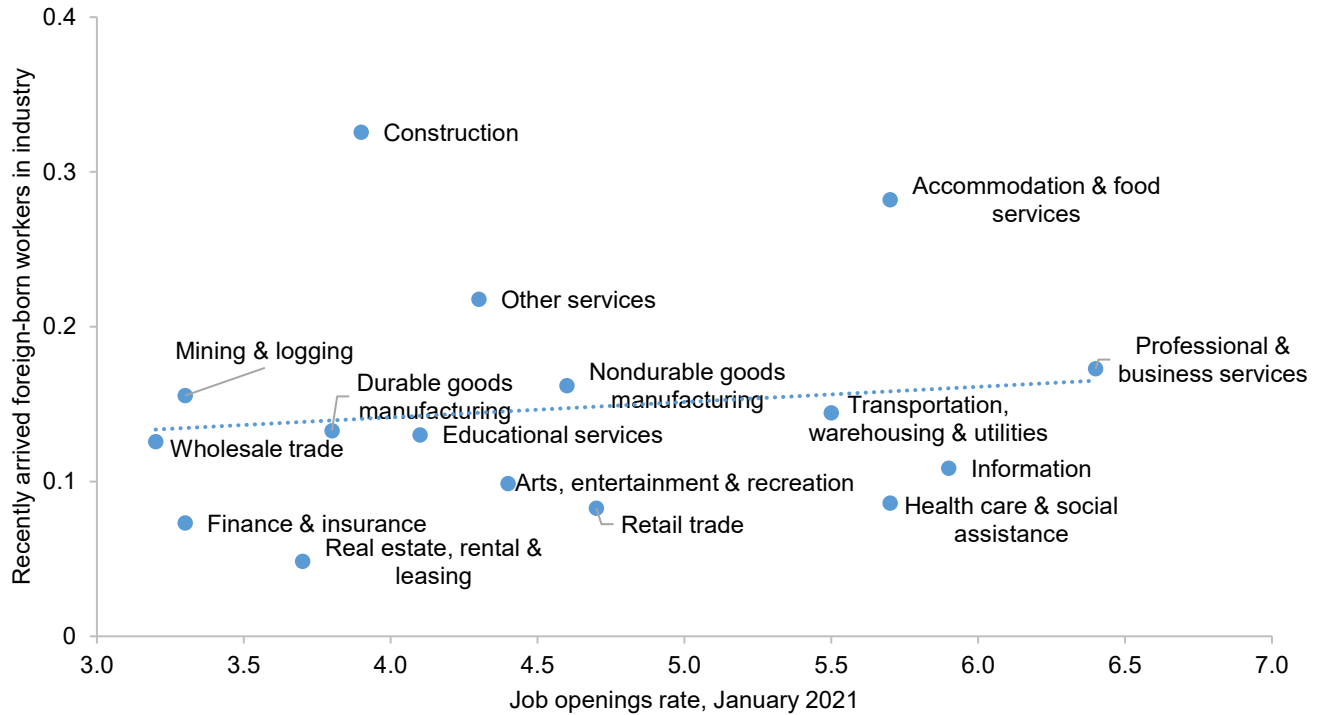
<sup>4</sup> The National Academies of Sciences 2017 report, *The Economic and Fiscal Consequences of Immigration*, provides a comprehensive summary of the literature. See <https://nap.nationalacademies.org/catalog/23550/the-economic-and-fiscal-consequences-of-immigration>.

<sup>5</sup> The number of recently arrived foreign-born workers in each sector during January 2022-May 2023 is scaled by total employment in that sector in January 2021. Higher values therefore reflect a bigger inflow of recently arrived foreign-born workers into that sector, relative to initial employment in that sector.

<sup>6</sup> The opposite holds as well: Industries that depend more heavily on foreign-born workers had bigger increases in their vacancy rates over 2016-2021 as international migration eased and then virtually ceased. Elijor Cohen and Samatha Shampine, "Immigration Shortfall May Be a Headwind for Labor Supply," *Federal Reserve Bank of Kansas City Economic Bulletin* (May 11, 2022), <https://www.kansascityfed.org/research/economic-bulletin/immigration-shortfall-may-be-a-headwind-for-labor-supply/>.

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**Figure 3**  
**Job Openings and Recently Arrived Foreign-Born Workers, by Industry**



Notes: The job openings rates are per 100 jobs in each industry and are seasonally adjusted data from the BLS JOLTS database. The measure of recently arrived foreign-born workers in each industry is scaled by the total number of workers in that industry as of January 2021, both calculated from the CPS.

Similarly, recently arrived foreign-born workers were particularly likely to go to states with tighter labor markets. Figure 4 shows the job openings rate in each state in January 2021 and the inflow of recently arrived foreign-born workers into each state between January 2022 and May 2023.<sup>7</sup> The relationship between the initial job openings rate and the inflow of recently arrived foreign-born workers into a state is positive, indicating that recent arrivals helped fill jobs in states that had more vacancies. Consistent with international migrants helping alleviate labor market tightness, other research shows that the ratio of job vacancies to unemployment falls when a state experiences net international migration inflows, as was the case across the U.S. in 2021 and 2022.<sup>8</sup>

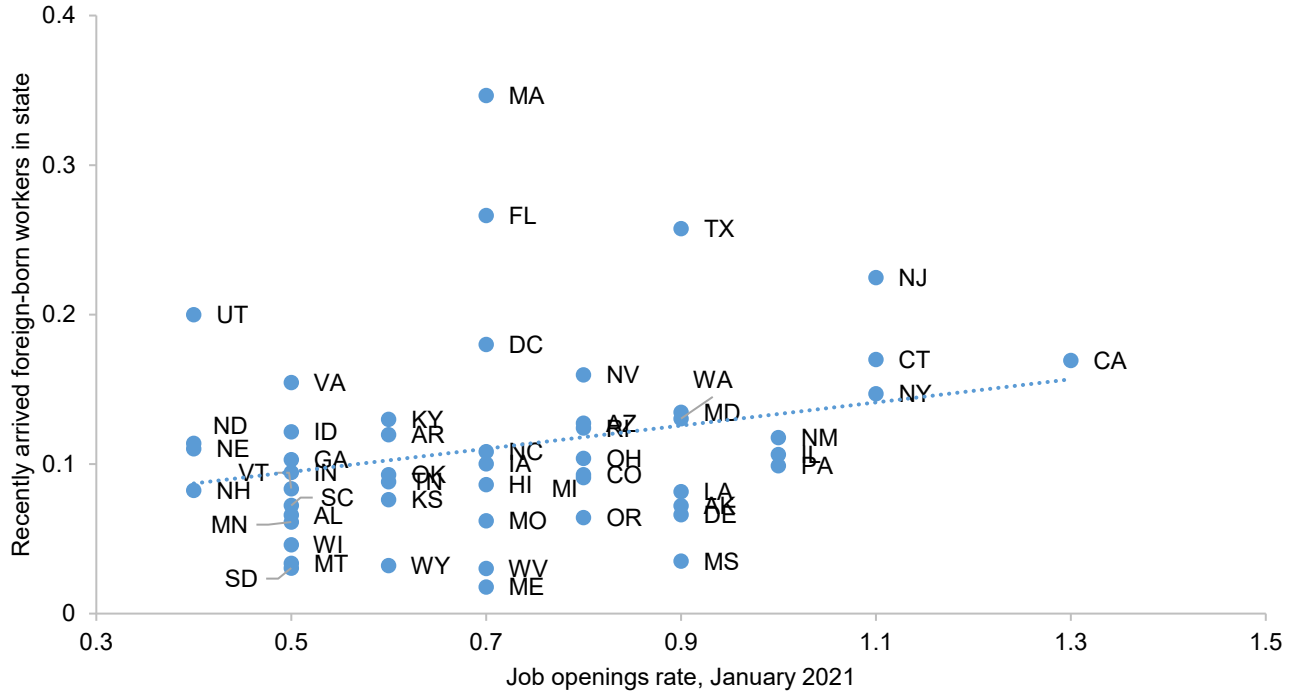
<sup>7</sup> The number of recently arrived foreign-born workers in each state during January 2022-May 2023 is scaled by the total number of working-age adults in that state in January 2021. Higher values reflect a bigger inflow of recently arrived foreign-born workers into that state, relative to the initial size of its working-age population.

<sup>8</sup> Evgeniya A. Duzhak, "The Role of Immigration in U.S. Labor Market Tightness," *Federal Reserve Bank of San Francisco Economic Letter* 2023-06 (February 27, 2023), <https://www.frbsf.org/economic-research/publications/economic-letter/2023/february/role-of-immigration-in-us-labor-market-tightness/>.



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**Figure 4**  
**Job Openings and Recently Arrived Foreign-Born Workers, by State**



Notes: The job openings rates are per 100 jobs in each state and are seasonally adjusted data from the BLS JOLTS database. The measure of recently arrived foreign-born workers in each state is scaled by the total number of workers in that state as of January 2021, both calculated from the CPS.

Labor markets have remained tight across industries and areas even as the U.S. experienced a resurgence of international migration when borders reopened. This points to both strong underlying labor demand and a shortfall of American workers. That shortfall is likely to only worsen in the future absent additional immigration, as discussed next.

**LONG-TERM TRENDS IN THE WORKING-AGE POPULATION**

Demographers have been warning for years that the falling U.S. birth rate will eventually cause the nation’s population to decline absent continued inflows from abroad. Population decline can easily lead to long-term economic stagnation or even contraction. One reason behind economic stagnation is that fewer people means fewer new ideas, which drive economic growth.<sup>9</sup> Another reason is that fewer people means fewer workers to produce goods and services. A drop in the working-age population puts price pressure on labor-intensive goods and services that cannot readily be imported from abroad. It also makes countries more vulnerable to disruptions

<sup>9</sup> For a discussion, see Charles I. Jones, “The End of Economic Growth? Unintended Consequences of a Declining Population,” *American Economic Review* 112 (2022): 3489-3527, <https://doi.org/10.1257/aer.20201605>.

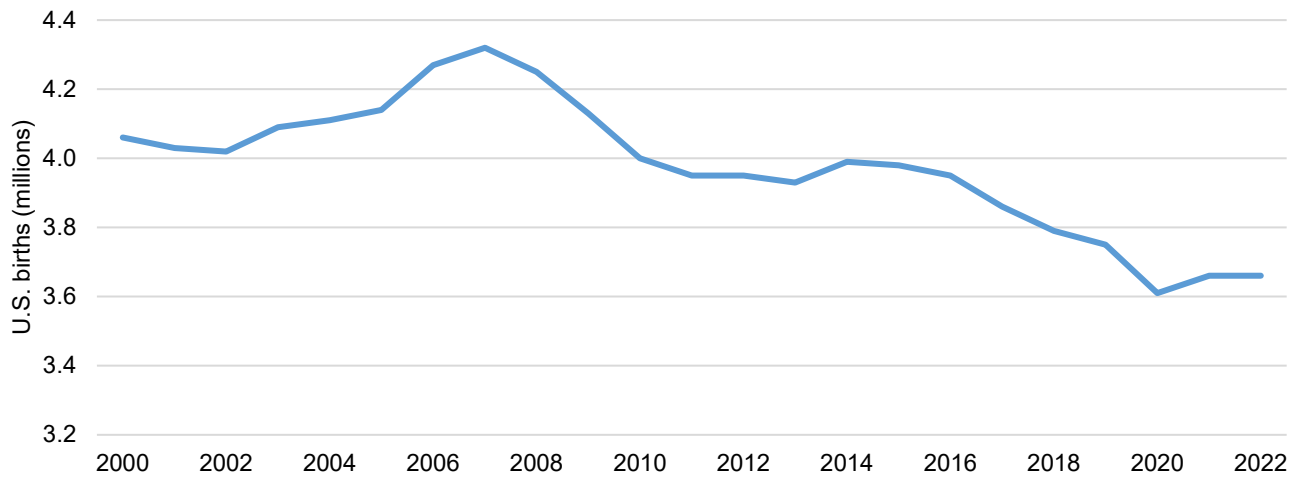
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to international trade – a concern that resonates in the wake of the pandemic – and may stymie attempts by companies to expand domestic production and to reshore operations from abroad.

Absent continued immigration, the U.S. risks experiencing a declining working-age population soon as a consequence of the falling number of births in recent years.<sup>10</sup> Indeed, the decline may have already begun.

The number of children born in the U.S. reached a post-1950s peak in 2007 and has fallen almost every year since then (Figure 5). Projecting forward, the drop in births that began in 2008 would be expected to cause the working-age population – those ages 18-64 – to grow more slowly after 2026 absent additional immigration. And if the number of people turning age 18 is smaller than the number turning age 65, the working-age population actually shrinks. Without immigration, this would have been the case for the U.S. as the end of the baby boom generation enters retirement.

**Figure 5  
U.S. Births**



Notes: Number of births from National Center for Health Statistics.

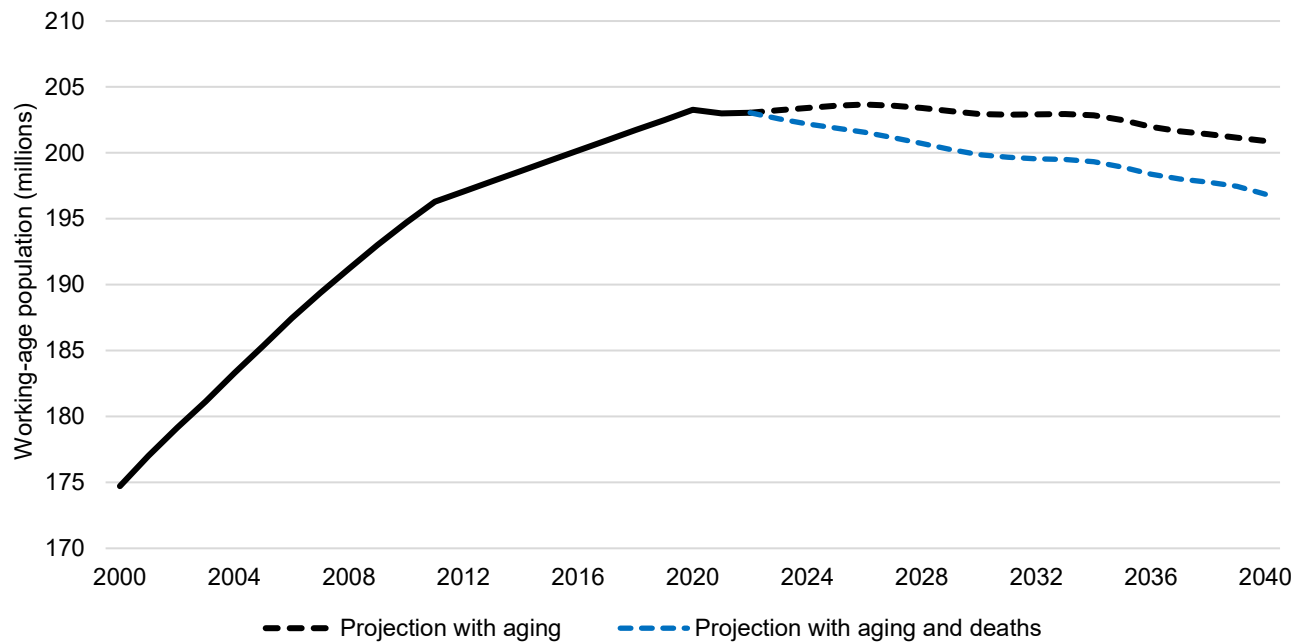
Figure 6 shows the implications of the drop in U.S. births for the eventual size of the working-age population. The figure shows the total U.S. working-age population each year during 2000-2022 (the solid black line) and two projections for its future over the next 18 years absent additional immigration. The figure projects forward the size

<sup>10</sup> This analysis examines the working-age population since that can be projected with more accuracy than the workforce, which reflects both the working-age population and the labor force participation rate.

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of the U.S. working-age population absent immigration over the next 18 years by, each year, replacing the number of people who are turning age 65 with the number who are turning age 18. The dashed black line shows the projected size of the working-age population, accounting for aging, if no one enters or leaves the U.S. after 2022. That line peaks in 2026, as expected, and after that the working-age population shrinks. By 2040, the U.S. would have over 2 million fewer working-age people than in 2022.

**Figure 6**  
**Projected Working-Age Population If No Additional Immigration**



Notes: Population estimates for 2000-2022 from U.S. Census Bureau. Data for 2012-2019 are smoothed between 2011 and 2020 population estimates.

As troubling as that projection is, it does not account for expected deaths. The dashed blue line applies age- and sex-specific mortality rates from 2019 (before the pandemic) to the projected population absent net international migration flows.<sup>11</sup> Accounting for expected deaths, the U.S. working-age population actually reached its peak in 2022 absent future additions from abroad. By 2040, the U.S. would have over 6 million fewer working-age people than in 2022. New immigrants are the *only* potential way to avoid a sizable decrease in the U.S. working-age population through at least 2040.

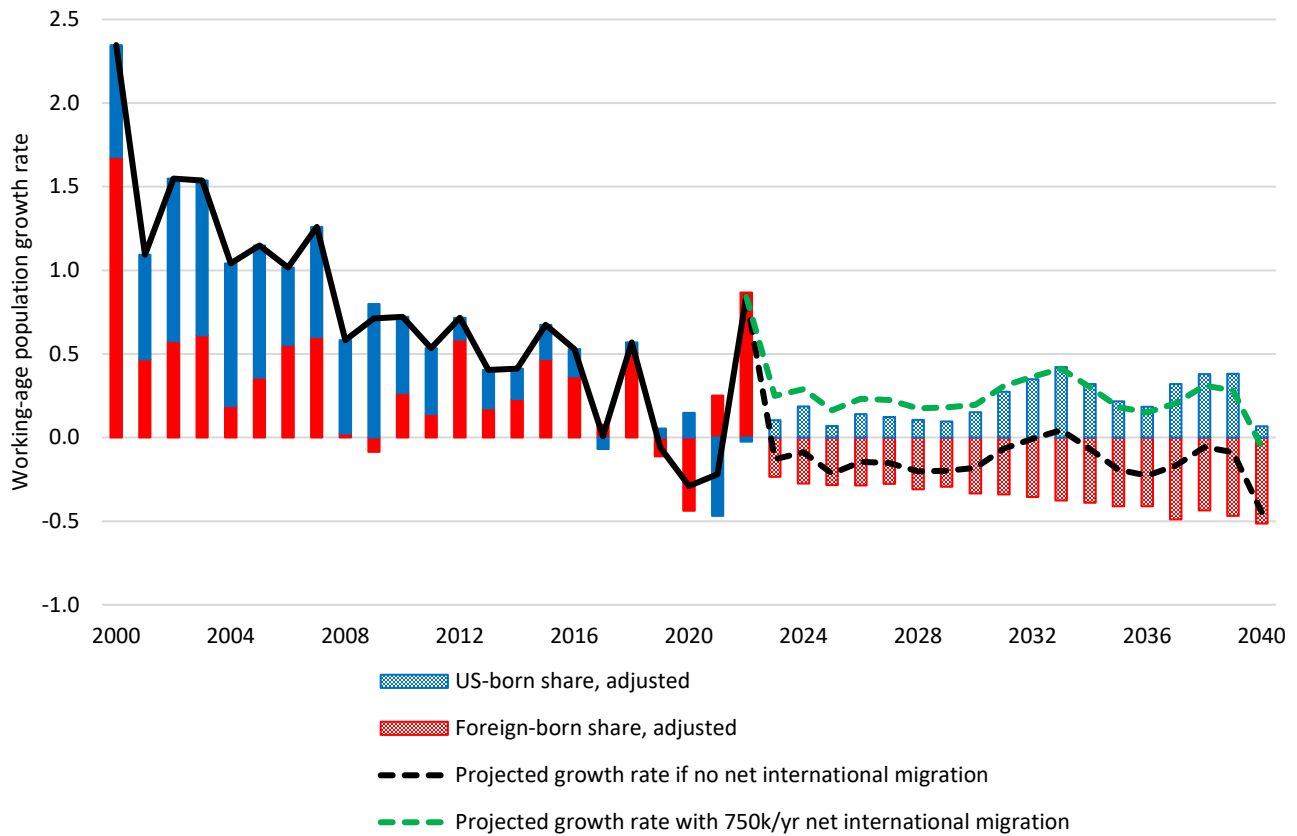
<sup>11</sup> Mortality rates are from the Social Security Administration ([https://www.ssa.gov/oact/STATS/table4c6\\_2019\\_TR2022.html](https://www.ssa.gov/oact/STATS/table4c6_2019_TR2022.html)).

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Notably, Figure 6 includes international migrants who are already present in the U.S. In 2022, over 18 percent of the population ages 18-64 was foreign born, and almost 4 percent of the population ages 0-17 (and another 46 percent of children had at least one foreign-born parent). Without those international migrants, the working-age population would have grown more slowly and perhaps already started to shrink.

Figure 7 further illustrates the importance of immigration to working-age population growth during 2000-2022 and in the coming years. The figure shows the growth rate of the total U.S. population ages 18-64 each year during the period 2000-2022 (the solid black line) and the contributions of U.S.- and foreign-born adults to that growth (the blue and red bars, respectively). As suggested by Figure 6, the growth rate of the total working-age U.S. population has been slowing over the last 2 decades, and the total working-age population shrank during the pandemic.

**Figure 7**  
**U.S.- and Foreign-Born Contributions to Working-Age Population Growth**



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U.S. natives accounted for about two-thirds of the growth in the working-age population during the first decade of the 2000s. As Figure 7 shows, the contribution of U.S. natives to growth then dwindled over the 2010s. The working-age population growth rate among U.S. natives reflects the difference between the number turning age 18 and the sum of the number turning age 65 and the number ages 18-64 who died in the last year. As the baby boom generation began to exit the working-age population starting in 2011, the contribution of U.S. natives to working-age population growth began to fall and even turn negative. For example, in 2021 the U.S.-born working-age population shrank due to a combination of excess deaths during the pandemic and the large number of baby boomers turning age 65 that year. In 2022, the U.S.-born working-age population continued to shrink, although by less than in 2021.

Slower growth and some contractions among the foreign-born working-age population also contributed to the drop in the overall growth rate shown in Figure 7. Unlike the case for U.S. natives, changes in the foreign-born working-age population are typically driven by net international migration flows, not by differences in cohort sizes or deaths. During the 2000s, the foreign-born working-age population grew at an average annual rate of 3.5 percent despite a drop in that population in 2009 as job opportunities weakened during the Great Recession. During the 2010s, smaller net inflows resulted in the foreign-born working-age population growing at an average annual rate of 1.6 percent. Despite that softening, the foreign born accounted for a much larger share of growth in the U.S. working-age population during the 2010s than during the 2000s.

The foreign-born working-age population fell slightly in 2019, and then fell sharply in 2020 as international borders closed and excess deaths soared among foreign born during the early stages of the pandemic. Then international migration began to resume as borders reopened, and in both 2021 and 2022, the foreign born were the only source of growth in the U.S. working-age population. Absent the growth among the foreign born, the total working-age population would have fallen by almost 0.5 percent in 2021. In 2022, it would have fallen again, albeit by only 0.03 percent.

Figure 7 shows two scenarios for the working-age population during 2023-2040. The dashed black line projects forward the population present in the U.S. as of 2022, allowing for aging and deaths but not for net international migration flows. In every year but one, the total working-age population shrinks. Interestingly, the contraction is due to a drop in the foreign-born working-age population (the shaded red bars), not the U.S. born (the shaded blue bars). This pattern occurs since growth in the foreign-born working-age population is mostly due to new inflows from abroad, not from childhood migrants aging into the workforce. After all, most people migrate across international borders as young adults, not as children. If the U.S. were to stop receiving new international migrants, the foreign-born working-age population would shrink each year as a result of aging and deaths. Meanwhile, the number of U.S.-born children – almost half of them the children of earlier immigrants – is likely to be large enough

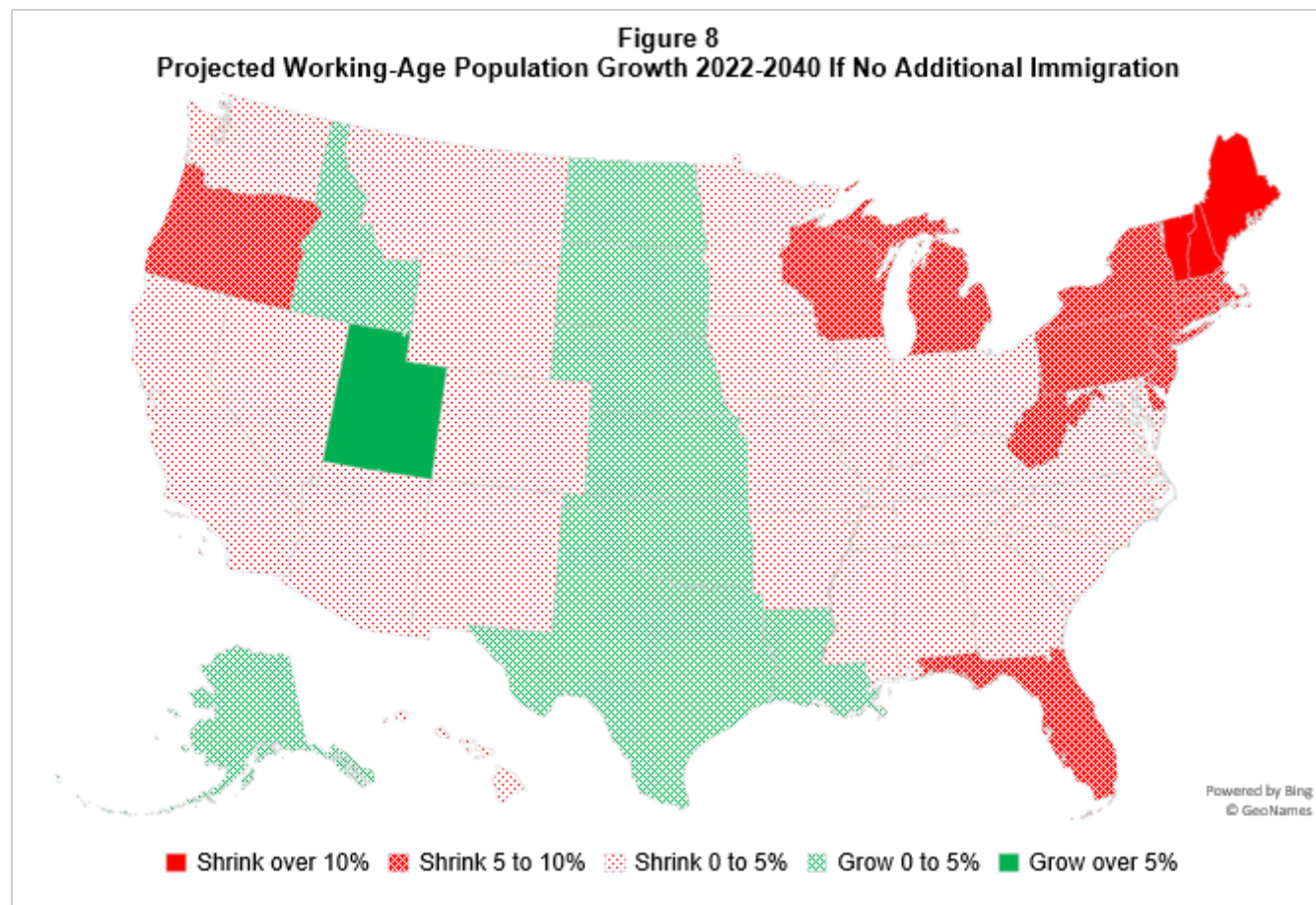
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to replace aging U.S. natives through at least 2040. However, the total number of children in the U.S. is not large enough to replace both aging U.S. natives and immigrants who are already here. The U.S. will need additional immigrants in order to avoid a shrinking working-age population.

The dashed green line in Figure 7 shows projected growth in the total working-age population if the U.S. has net inflows of 750,000 working-age foreign born each year through 2040, a magnitude near the annual average during 2000-2018. Maintaining inflows at that level would forestall a contraction in the working-age population, but growth would average only 0.2 percent a year. The working-age population averaged over 0.8 percent annual growth over 2000-2019, in contrast. And by 2040 the working-age population is still projected to shrink without an increase in net international migrant flows.

Absent inflows from abroad or from other states, the majority of states will see their working-age population shrink in the coming years. Figure 8 shows the projected change in the working-age population in each state between 2022 and 2040. The projections apply national sex- and age-specific death rates to the state's existing population and do not allow for either inflows or outflows with other states or countries. Maine, New Hampshire, and Vermont would see their working-age population fall by over 10%. Twelve states would see their working-age population fall by 5 to 10%, and another 25 states plus Washington, D.C., would see their working-age population fall by less than 5%. Only Utah would see its working-age population grow by over 5%, and another nine states would see their working-age population grow by less than 5%.

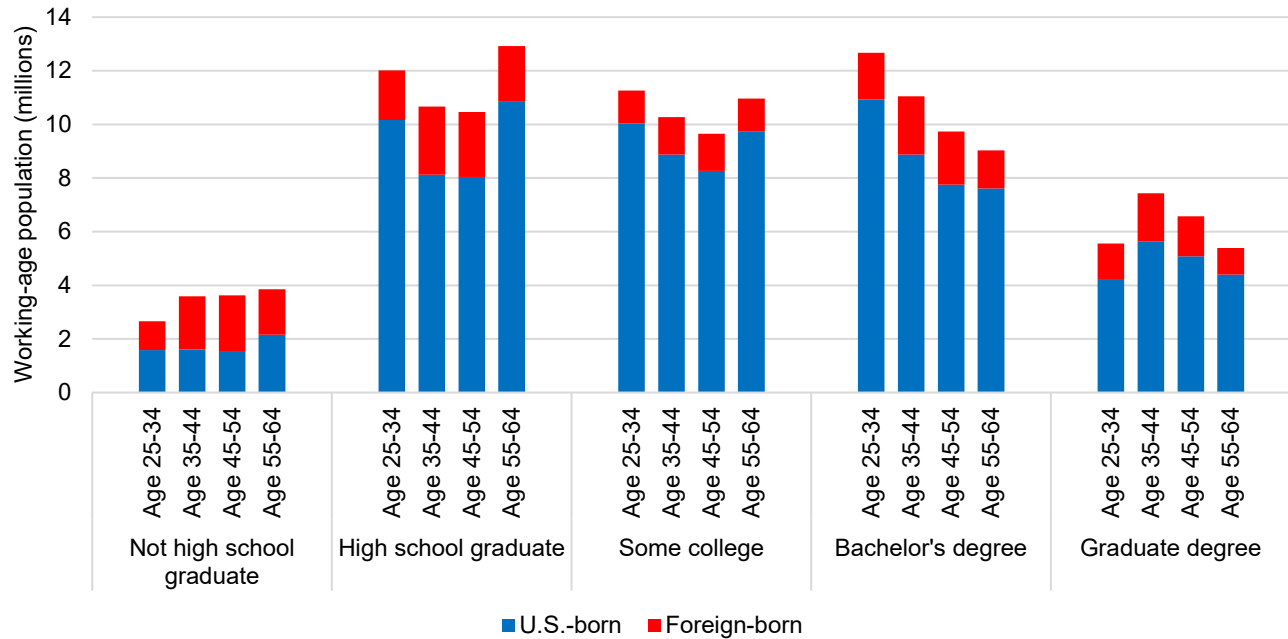


Of course, some states would likely grow faster (or shrink less) than Figure 8 projects since they would be able to attract working-age adults from other states. But absent inflows from abroad, one state’s population gain must be another state’s population loss. Additional immigration is the only way the working-age population can grow in the U.S. as a whole between 2022 and 2040.

The decline in the working-age population due to aging is likely to be particularly pronounced among those who have not completed a bachelor’s degree. Figure 9 shows the size of the working-age population in 2022 by 10-year age groups for five categories of educational attainment. The education group that will shrink the most in absolute numbers in the coming years because of aging (absent immigration inflows) is high school graduates. The some-college and not-high-school-graduate groups will be disproportionately affected by aging, although the latter is small in absolute numbers.

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**Figure 9**  
**Working-Age Population, by Age, Education, and Nativity**



Notes: Calculations based on 2022 CPS data.

The foreign born are more likely than U.S. natives to be at the ends of the educational distribution. As the relative sizes of the red and blue bars in Figure 9 indicate, international migrants are overrepresented among people who have not completed high school and people who have a graduate degree. If the past is any predictor of the future, new international migrants will particularly be needed to replace aging U.S. residents in those education groups since U.S. natives tend to be in the middle of the educational distribution. However, labor demand for formal educational credentials and associated skills may change considerably in the coming years. In particular, the ongoing innovations in generative artificial intelligence (AI) are likely to change labor demand. How labor demand will change is difficult to predict, however.<sup>12</sup> Generative AI may reduce labor demand by doing some tasks formerly done by people, or it may increase labor demand by increasing productivity. It may increase demand for highly educated workers who do cognitive tasks that are complements to AI, or it may substitute for some of those workers. Workers who do physical tasks that are hard to automate, from picking delicate crops to taking care of children or

<sup>12</sup> For a discussion, see, for example, Martin N. Baily, Erik Brynjolfsson, and Anton Korinek, "Machines of Mind: The Case for an AI-Powered Productivity Boom," Brookings Institution (May 10, 2023), <https://www.brookings.edu/articles/machines-of-mind-the-case-for-an-ai-powered-productivity-boom/?s=09>. Recent evidence from Europe suggests that AI increases employment in more-affected sectors. Stefania Albanesi et al., "New Technologies and Jobs in Europe," IZA Discussion Paper No. 16227 (June 2023), <https://docs.iza.org/dp16227.pdf>.



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the elderly, are particularly unlikely to be replaced by technology, including AI, and demand for their labor is likely to increase if AI raises incomes and wealth.

Although the effects of generative AI on labor demand are unknown, past technological shifts have led to increased overall labor demand in the medium and long run. Workers may need to acquire new skills or move to new areas as labor demand shifts from declining sectors and areas to growing ones, but technological progress ultimately raises total demand for workers by increasing productivity and incomes. And in the short run, technological change may raise demand for the types of workers who are in short supply domestically. Admitting more foreign-born workers who already have in-demand specialized skills that take years to acquire can help an economy adjust in the face of rapid technological change. This is particularly true in technology-intensive sectors in the U.S., including AI. Foreign-born entrepreneurs, workers, and students play critical roles in those sectors, making it important that the U.S. continue to attract and retain those international migrants.<sup>13</sup>

## DISCUSSION AND CONCLUSION

The U.S. emerged from the pandemic with extremely tight labor markets. Strong demand for workers, an aging population, and several years of low-to-no international migration combined to push the number of job vacancies per unemployed worker to a historic peak. Labor market tightness has been pervasive across industries and states, and record inflows of new international migrants once borders reopened have not fully met the demand for workers. Labor demand is likely to remain strong in the short to medium run as federally funded infrastructure projects roll out and the U.S. pushes to ramp up domestic semiconductor production. Additional workers will be needed to help with those initiatives, and domestic labor is unlikely to be sufficient to meet the demand. In the longer run, generative AI and other forms of technological progress are likely to contribute to labor demand by raising productivity and incomes. The U.S. will still need workers, and it risks not having enough of them, particularly those with desired skills, absent additional immigration.

The working-age U.S. population has peaked absent additional immigration. Years of fewer births are beginning to translate into a shrinking working-age population. New international migrants are the only potential source of growth in the U.S. working-age population over the remainder of the next two decades.

The U.S. is not alone in facing a shrinking working-age population. Projected declines absent additional immigration are far larger in much of Western Europe and parts of Asia, including China, Japan, South Korea, and Taiwan. As a result, competition to attract working-age international migrants is likely to intensify. Other countries are already

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<sup>13</sup> See Stuart Anderson, "AI and Immigrants," NFAP Policy Brief (June 2023), <https://nfap.com/research/new-nfap-policy-brief-ai-and-immigrants/>.

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rolling out new initiatives to attract workers. In July 2023, Canada added to its Tech Talent Strategy a new initiative that allows 10,000 U.S. H-1B visa holders and their families to relocate there.<sup>14</sup> Also in 2023, Germany announced plans to create and expand its pathways for skilled immigrant workers from outside the European Union.<sup>15</sup> Even Japan has created new immigration pathways for high-skilled professionals and blue-collar workers.<sup>16</sup> Meanwhile, U.S. immigration policy has remained little changed, particularly for highly skilled workers.

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<sup>14</sup> See Stuart Anderson, "Canada's Immigration Rules Boost Companies And H-1B Visa Holders," (July 2, 2023), <https://www.forbes.com/sites/stuartanderson/2023/07/02/canadas-immigration-rules-boost-companies-and-h-1b-visa-holders/?sh=6c28affe7dd7>.

<sup>15</sup> See <https://www.fragomen.com/insights/germany-new-immigration-bill-seeks-to-attract-non-eu-skilled-workers.html>.

<sup>16</sup> See <https://www.japantimes.co.jp/news/2023/02/17/national/new-visa-categories-graduates-high-earners/> and <https://mainichi.jp/english/articles/20230609/p2g/00m/0na/036000c>.

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