Navigating the Future of Work

The Role of Immigrant-Origin Workers in the Changing U.S. Economy

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Executive Summary

Before the COVID-19 pandemic hit in early 2020, resulting in a sudden economic downturn and widespread job losses, discussions about the future of work in the United States generally focused on two concerns: (1) whether automation and offshoring would destroy jobs and increase unemployment, and (2) whether the quality of jobs would decline. By some predictions, automation and offshoring are poised to replace many of the jobs that U.S. workers hold, leading at best to broad labor market disruptions and at worst to large-scale unemployment. Further, some observers contend that the traditional employer-employee relationship is breaking down, and that future U.S. workers will mainly be self-employed contractors or gig workers, with few workplace rights and limited access to employee benefits. While in prior periods fears that automation would create mass unemployment in the United States were not borne out, some economists and futurists predict that the current pace of technological growth and the advent of artificial intelligence mean that the coming years will be different.

Research into the future of work almost always ignores another important force shaping the U.S. labor market: immigration. Immigrant-origin workers—that is, immigrants and their U.S.-born children—have been the main drivers of U.S. workforce growth in recent years. They were responsible for 83 percent of labor force growth between 2010 and 2018, at which point they comprised 28 percent of all U.S. workers. And projections suggest that through 2035, all growth in the working-age population will come from immigrant-origin adults.

Bringing immigrant-origin workers into the conversation about the future of work in the United States is important for understanding how these and other workers may fit within the economy as some occupations grow and others decline.

Bringing immigrant-origin workers into the conversation about the future of work in the United States is important for understanding how these and other workers may fit within the economy as some occupations grow and others decline. The jobs of the future, as identified in this report, are those projected to show large growth over the next ten years, with a below-average risk of automation and offshoring. Declining jobs, meanwhile, are those projected to grow very slowly or shrink over the next ten years, with an above-average risk of automation and offshoring. This analysis examines how immigrant-origin workers fit into each group, drawing comparisons with third/higher-generation workers (those born in the United States to U.S.-born parents).

The scale and duration of COVID-19's impacts on the U.S. labor market are, at present, unknown and unknowable. The response to the pandemic has upended the U.S. economy, leading to unemployment rates in Spring 2020 not seen since the Great Depression, with immigrant workers hit harder than U.S.-born workers. Given the uncertainty around when the health crisis will abate, it is hard to know how many of the job losses brought by the pandemic-related recession will be temporary and how many will become permanent. Sectors such as hospitality, retail, and construction initially lost large shares of their workforces. While retail and construction recovered to some extent over the summer of 2020, job losses in hospitality have persisted.

Because it is too soon to speculate on the pandemic's full labor market impacts, this report does not attempt to do so. Rather, it assesses critical trends in the changing nature of work for the period 2010–18 and sets out the best estimates of how work could change in the coming decade or two. The effects of COVID-19 could alter some of these longer-term trends, but many are likely to persist. As the U.S. population continues to age, demand for health-care workers is likely to continue to grow; brick-and-mortar retail jobs are likely to decline as online retail continues to gain in popularity; automation is perhaps now even more likely to replace some lower-skilled jobs; and education and social service jobs seem likely to hold steady, if not expand.

Notwithstanding the rapidly changing economic context, this study identifies the following principal findings:

- **The jobs of the future will mainly be high skilled or middle skilled.** The jobs projected to grow the most over the coming decade, and to have a lower risk of automation and offshoring, tend to be high skilled (generally requiring a bachelor's degree or higher, or at least several years of experience or training) or middle skilled (generally requiring vocational schooling, an associate degree, or one to two years of on-the-job training or experience). Jobs of the future are concentrated in health care, education, management, and social service occupations.
- **The future is less certain for low-skilled jobs, in large part because they are projected to be the most susceptible to automation.** On the one hand, the U.S. Department of Labor's Bureau of Labor Statistics has projected high growth for some low-skilled jobs between 2018 and 2028, including personal and home care aides, food preparation and serving workers, home health-care aides, cooks, and janitors. On the other hand, lower-skilled jobs are projected to be at a higher risk of automation than other occupations. However, the potential timing and scale of automation's effects on these and other low-skilled jobs are uncertain, in part because immigration and other changes in worker supply can influence the pace of automation.
- **Immigrant-origin workers face about the same prospects for future job growth and decline as other U.S. workers.** In 2018, 22 percent of immigrant-origin workers held jobs of the future, compared to 24 percent of third/higher-generation workers. At the same time, 26 percent of immigrant-origin workers were in occupational groups projected to decline, compared to 29 percent of third/higher-generation workers.
- **Women are more likely than men to hold both jobs of the future and declining jobs.** As of 2018, women were heavily concentrated in jobs of the future in health care, health-care support, and personal service occupations, as well as in declining office and administrative support occupations. Male-dominated jobs often fell somewhere between these two categories; many occupations such as construction, transportation, and computer and mathematical jobs are projected to grow but are also at a higher risk of automation and offshoring than many occupations held predominantly by women.
- **Both immigrant-origin and third/higher-generation Latinos are less likely than workers in other major racial or ethnic groups to hold jobs of the future and more likely to hold declining jobs.** They were underrepresented in management and health-care practitioner occupations in 2018 and overrepresented in farming, forestry, and fishing occupations and in production jobs such as manufacturing.

- **Black immigrant-origin workers have better future labor market prospects than Black third/higher-generation workers.** Due at least in part to their high average educational attainment, Black immigrant-origin workers were overrepresented in jobs of the future in 2018, particularly in health care and health-care support. By contrast, U.S.-born Black workers with U.S.-born parents were overconcentrated in declining jobs, such as office and administrative support occupations. Black immigrants to the United States are generally positively selected for their schooling and skills, while the educational attainment and job prospects of native-born Black workers are heavily affected by the long history of racial discrimination in the United States.
- **White and Asian workers, particular those of immigrant origins, are well-positioned for jobs of the future.** White and Asian American and Pacific Islander (AAPI) immigrant-origin workers held jobs of the future at higher rates and declining jobs at lower rates in 2018 than immigrant-origin workers overall. White and AAPI third/higher-generation workers were about as likely as all third/higher-generation workers to hold jobs of the future.
- **The available evidence does not suggest a sharp rise in contract or contingent work, despite earlier concerns about a shift toward these more precarious forms of work.** In 2018, the main jobs of most U.S. workers, including those with immigrant origins, involved traditional, formal employment arrangements: they held jobs expected to last for an extended period and were listed on the company payroll. The share of U.S. workers primarily employed through less formal arrangements—those in contract positions or contingent work (i.e., jobs with a limited duration)—has held steady over the past 15 years. However, available evidence suggests that immigrant-origin workers may be more likely than third/higher-generation workers to be misclassified as contract workers and to work in the informal economy, and that they are slightly more likely to work in limited-duration jobs.

Many workers in declining jobs may find that it takes substantial effort through additional education, training, and/or work experience to attain the skills necessary to secure jobs of the future. The declining jobs in which immigrant-origin workers are concentrated tend to be low-skilled occupations, while most jobs of the future are middle- or high-skilled positions. Making the leap between the two would likely require obtaining additional educational or professional credentials and, for some, stronger English skills.

Native-born workers with native-born parents are just as likely as those from immigrant families to hold declining jobs, so both groups would benefit from workforce development services to prepare them for jobs with better growth prospects. But immigrant-origin workers are at an overall disadvantage in the labor force as they are more likely to lack a high school diploma than the third/higher generation and almost one-third have limited English proficiency. Moreover, significant numbers of well-educated immigrant-origin workers may require additional training and credentialing services if their degrees, training, or professional credentials were earned abroad and do not meet the requirements of U.S. employers.

The pandemic has further complicated the picture by adding an additional layer of unpredictability to the future trajectory of many industries and occupations. As a result, U.S. education systems and workforce development programs will need to help all workers, including those from an immigrant background, not only gain work-related skills but also boost digital competences and develop career resilience. These assets

allow workers to respond proactively to changing labor market conditions and pivot away from declining and toward emerging job opportunities.

U.S. education systems and workforce development programs will need to help all workers ... not only gain work-related skills but also boost digital competences and develop career resilience.

Once the economy has started to recover from the pandemic-related economic downturn, the United States will likely continue to benefit from sustained immigration of workers across the skill spectrum. Yet, projections suggest that automation may one day replace many low-skilled workers, making the future economic benefits of admitting less-educated immigrant workers uncertain. The economic adjustments taking place during the health crisis—as employers adjust their modes of operation and consumer seeks safer ways to access goods and services—may accelerate automation, potentially worsening labor market prospects for low-skilled immigrant-origin and third/higher-generation workers alike. Policymakers setting immigration levels and categories should carefully monitor these trends, particularly in low-skilled occupations, to provide sufficient labor supply where demand exists, while avoiding the admission of immigrant workers whose job prospects seem likely to dissipate over time.

1 Introduction

Even before COVID-19 swept into the United States, leading to widespread job losses amid lockdown measures designed to stop the spread of the virus, economists and other observers were predicting big changes ahead in the nature of work in the country. The development of technologies such as self-driving cars and trucks, self-checkout machines, robotic berry pickers, and artificial intelligence has led to a generalized fear that automation will replace human workers, leaving millions of Americans unemployed. These fears are based on the recognition that millions of jobs, particularly in manufacturing, have already been automated or moved to countries with lower labor costs.[1] In response to these developments, several states have established future-of-work commissions or task forces to gather evidence about how the nature of work is changing and develop related policy recommendations.[2]

Recent and projected trends have also raised questions about which groups of U.S. workers will be most affected by automation and offshoring. Some researchers predict that women will face a greater threat, while others expect men to be more affected.[3] Still others have found Black and Latino workers at higher risk of losing jobs to automation than White or Asian workers.[4]

1 Drew Desilver, "Most Americans Unaware that as U.S. Manufacturing Jobs Have Disappeared, Output has Grown," Pew Research Center, July 25, 2017.
2 Rachael Stephens and Libby Reder, "Creating a Future of Work Commission: One Step States Can Take to Prepare for the Future of Work," The Aspen Institute, June 28, 2019.
3 Marcus Casey and Sarah Nzau, "The Differing Impact of Automation on Men and Women's Work," Brookings Institution, September 11, 2019.
4 Kristen Broady, "Race and Jobs at High Risk to Automation" (issue brief, Joint Center for Political and Economic Studies, Washington, DC, December 18, 2017).

Immigrant-origin workers make up more than one-quarter of the U.S. workforce and are expected to drive all growth in the working-age population until at least 2035.

None of these studies have looked at how automation, offshoring, and other labor markets trends will affect immigrant-origin workers in the United States, a group that includes both foreign-born workers (i.e., first-generation immigrants) and U.S.-born workers with at least one foreign-born parent (the second generation). Such data are lacking despite the fact that immigrant-origin workers make up more than one-quarter of the U.S. workforce and are expected to drive all growth in the working-age population until at least 2035.[5] This report aims to fill the gap by examining the occupations immigrant-origin workers hold, as compared to third/higher-generation workers (U.S.-born workers with U.S.-born parents), and how projected workforce changes are likely to affect the role of immigrant-origin workers in the U.S. economy.

The COVID-19 pandemic has brought an additional layer of complexity to this discussion by rapidly changing U.S. labor market conditions. During the first three months of the pandemic (February through April 2020), more than 25 million U.S. jobs were lost and the official unemployment rate rose from less than 4 percent to nearly 15 percent.[6] The summer brought slow economic recovery, but unemployment in September 2020 was 8 percent, about twice the pre-pandemic rate.[7] While these job losses have hit many U.S. workers hard, unemployment rose more sharply in the spring of 2020 among immigrants than the native born, and much higher for workers in some occupations such as hospitality and retail trade than others.[8]

Although the full scope and duration of COVID-19's labor market impacts remain to be seen, the projections used in this report largely reflect long-term trends that are likely to persist beyond the pandemic-related economic crisis and the eventual economic recovery. Health-care, education, and social service occupations seem very likely to continue to grow as the U.S. population ages and the country continues to invest in education. Brick-and-mortar retail jobs and office support jobs seem likely to continue to be replaced by online retail and by the development of new software. And it seems, if anything, more likely that lower-skilled jobs will be automated.[9] It is less clear if production (manufacturing)[10] will continue to leave the United States at the rate it has been.

5 Jeffrey S. Passel and D'Vera Cohn, "Immigration Projected to Drive Growth in U.S. Working-Age Population through at Least 2035," Pew Research Center, March 8, 2017.

6 The unemployment rate was 3.5 percent in February 2020, and the number of employed workers was 158.8 million. By April 2020, the unemployment rate increased to 14.7 percent and the number of employed workers fell to 133.4 million. See U.S. Bureau of Labor Statistics (BLS), "The Employment Situation – February 2020" (news release, March 6, 2020); BLS, "The Employment Situation – April 2020" (news release, May 8, 2020).

7 BLS, "Employment Situation – September 2020" (news release, October 2, 2020).

8 Monthly unemployment rates by place of birth, gender, race/ethnicity, educational attainment, and industry are available at Migration Policy Institute (MPI) Data Hub, "U.S. Unemployment Trends by Nativity, Gender, Industry, & More, Before and During Pandemic," accessed October 2, 2020.

9 UC Berkeley Labor Center, "COVID-19 and Technology at Work," updated June 8, 2020.

10 Manufacturing involves the conversion of raw materials into finished products, while production is a broader category that also encompasses the conversation of non-tangible goods (such as money, credit, or labor) into finished products.

BOX 1
About the Rethinking U.S. Immigration Policy Project

This report is part of a multiyear Migration Policy Institute (MPI) project, Rethinking U.S. Immigration Policy. At a time when U.S. immigration realities are changing rapidly, this initiative aims to generate a big-picture, evidence-driven vision of the role immigration can and should play in America's future. It will provide research, analysis, and policy ideas and proposals—both administrative and legislative—that reflect these new realities and needs for immigration to better align with U.S. national interests.

This research report provides background information and data intended to inform the development of forthcoming policy recommendations for changes to U.S. legal immigration policy. To learn more about the project and read other reports and policy briefs generated by the Rethinking U.S. Immigration Policy initiative, see bit.ly/RethinkingImmigration.

To explore these longer-term trends, Migration Policy Institute (MPI) researchers analyzed data from the U.S. Census Bureau's Current Population Survey (CPS), Bureau of Labor Statistics (BLS) projections on the expected growth in the workforce between 2018 and 2028, and occupation-specific projections by economists regarding automation and offshoring. (See Appendix A for more information on these data sources and their strengths and weaknesses.)

The first section of this report describes the demographic characteristics of immigrant-origin workers and their role in overall U.S. labor force growth. The section that follows identifies which jobs are likely to grow in the future and which are likely to decline, and the degree to which immigrant-origin workers versus third/higher-generation workers and workers from various racial/ethnic groups fill these two categories of jobs. This section also addresses the changing quality of work. The report concludes by discussing how the findings of this analysis can inform workforce development investments and immigrant-selection policies.

2 The Immigrant-Origin Workforce

Immigrants and the U.S.-born children of immigrants have played an outsized role in recent U.S. labor force growth.[11] The U.S. workforce grew from about 154.5 million in 2010 to 163.9 million in 2018, with immigrant-origin workers making up 83 percent of this growth. In 2010, 25 percent of all U.S. workers were of immigrant origins (38.0 million people), a share that rose to 28 percent by 2018 (45.8 million). Given that the overall U.S. population is aging and the fertility rate is declining, immigrant-origin workers are projected to drive all growth in the working-age population over the coming 15 years.[12] This would hold true even if immigration falls over the next several years.

11 Workers are defined here as adults ages 16 and older in the civilian labor force with a valid occupational code in the Current Population Survey (CPS) data. This definition includes some adults who were unemployed but looking for work during the week preceding the survey.

12 U.S. Census Bureau, "Older People Projected to Outnumber Children for First Time in U.S. History" (press release, March 13, 2018); Brady E. Hamilton, Joyce A. Martin, Michelle J.K. Osterman, and Lauren M. Rossen, "Births: Provisional Data for 2018" (Vital Statistics Rapid Release, Report No. 7, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, and National Vital Statistics System, May 2019); Passel and Cohn, "Immigration Projected to Drive Growth in U.S. Working-Age Population."

BOX 2
Key Terms

Immigrant-origin workers. This group includes both workers who are first-generation immigrants (born outside the United States) and those who are members of the second generation (born in the United States to one or more foreign-born parents).

Third/higher-generation workers. These workers were born in the United States and have only U.S.-born parents.

Low-skilled jobs. Occupations in this category usually require no more than a high school diploma and/or one year of training. They are classified as Job Zone 1 or 2 by the U.S. Department of Labor's Bureau of Labor Statistics (BLS).

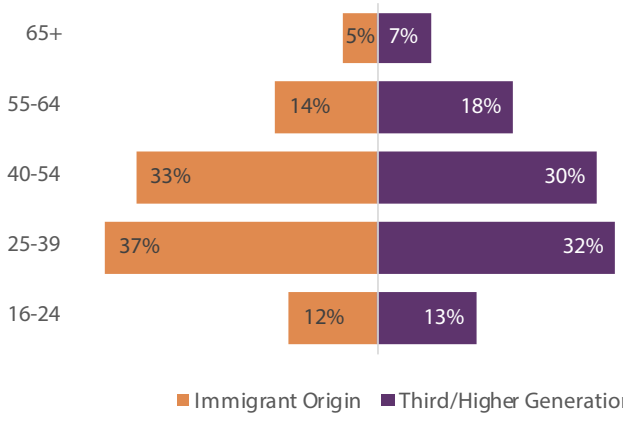
Middle-skilled jobs. These occupations usually require vocational schooling, an associate degree, or one to two years of on-the-job training or experience. BLS classifies them as Job Zone 3.

High-skilled jobs. High-skilled occupations usually require a bachelor's degree or higher, or at least several years of experience or training. BLS classifies them as Job Zone 4 or 5.

Note: Appendix A provides more detail on how BLS classifies jobs by skill level.
Source: U.S. Department of Labor, Employment and Training Administration, "O*NET Online," accessed October 1, 2020.

FIGURE 1

Age Distribution of Immigrant-Origin and Third/Higher-Generation Workers in the United States, 2018



Source: Migration Policy Institute (MPI) tabulation of data from the U.S. Census Bureau's monthly 2018 Current Population Survey (CPS), averaged across the year.

Among immigrant-origin workers in 2018, 62 percent were first-generation immigrants and 38 percent were the children of immigrants. Among the working-age population, the second generation is projected to grow the fastest over the coming 15 years. The third/higher-generation working-age population was shrinking and projected to decline further over this period.[13]

As of 2018, immigrant-origin workers were slightly more likely to be men than third/higher-generation workers: 55 versus 52 percent. They were also younger and more likely to be of prime working age (25 to 54 years old) than their third/higher-generation counterparts (see Figure 1). Because a larger share of third/higher-generation workers are over age 55, they are more likely to retire sooner—one key reason immigrant-origin workers will be important for future workforce growth.

Immigrant-origin workers were almost as likely as third/higher-generation workers to have a bachelor's degree or higher in 2018, but also four times as likely to lack a high school education (see Figure 2).

Immigrant-origin workers were somewhat more likely than third/higher-generation workers to hold low-skilled jobs and less likely to hold high-skilled jobs. As of 2018, 55 percent of immigrant-origin workers were in low-skilled occupations, compared to 46 percent of third/higher-generation workers. Meanwhile, 28 percent of immigrant-origin workers were in high-skilled positions, versus 34 percent for third/higher-generation workers.

13 Passel and Cohn, "Immigration Projected to Drive Growth in U.S. Working-Age Population."

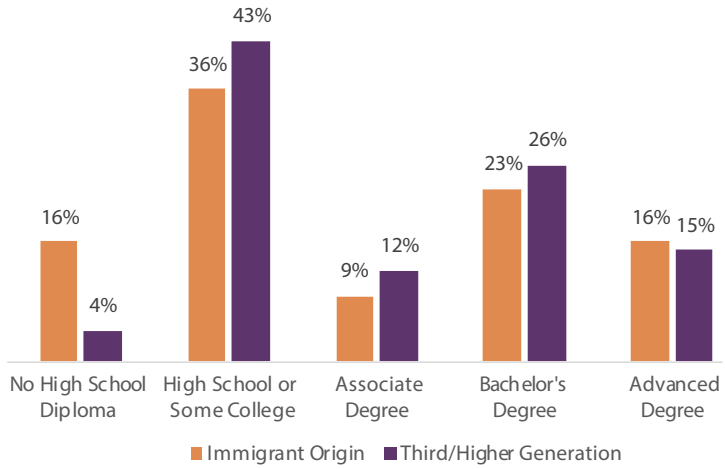
Close to one-third of immigrant-origin workers in 2018 had limited English skills. While 68 percent were fully proficient, meaning they reported speaking only English or speaking English "very well," the remaining 32 percent were Limited English Proficient (LEP)—that is, they reported speaking English "well," "not well," or "not at all."[14]

More limited educational attainment and English skills reduce the range of occupations open to immigrant-origin workers, leaving them more exposed to automation, offshoring, and other long-term pressures on low-skilled work. Still, when the U.S. economy recovers from the crisis brought by the COVID-19 pandemic, a substantial number of well-educated immigrant-origin workers are poised to prosper in the middle- and high-skilled jobs of the future. Those who are English proficient and speak a different home language may also have an advantage if the U.S. economy continues to globalize in the way that it has been and their multilingualism helps them attain jobs.

In the meantime, during the COVID-19 crisis and recovery, many workers—both those of immigrant origins and the third/higher generation—will seek to retool their skills to match those expected to be valued in the future. These workers will benefit from well-targeted and inclusive training and skill-development programs that not only equip them with work-related skills but that also boost digital literacy, build career resilience,

FIGURE 2

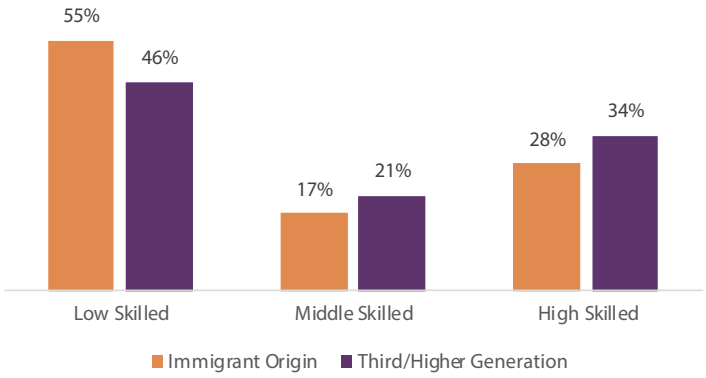
Educational Attainment of Immigrant-Origin and Third/Higher-Generation Workers in the United States, 2018



Source: MPI tabulation of data from the monthly 2018 CPS, averaged across the year.

FIGURE 3

Occupational Skill Level of Immigrant-Origin and Third/Higher-Generation Workers in the United States, 2018



Source: MPI tabulation of data from the monthly 2018 CPS, averaged across the year, combined with data from the U.S. Department of Labor's O*NET skill-level classification; see Appendix A for details.

14 The CPS does not capture respondents' English proficiency. Therefore, English proficiency rates were calculated using the American Community Survey (ACS). The ACS data allow respondents to be defined as either U.S. or foreign born, making it possible to identify first-generation immigrant workers who reported being Limited English Proficient (LEP). Since the ACS does not separately identify persons who are the U.S.-born children of immigrants, the MPI researchers assumed that all U.S.-born workers who reported being LEP were members of the second generation and added their number to the number of LEP foreign-born workers to calculate the overall LEP share of immigrant-origin workers. According to MPI estimates, 45 percent of first-generation workers and 10 percent of the second-generation workers were LEP. Drawing on the research literature, this analysis assumes that there are very few U.S.-born children of U.S.-born parents who are LEP, given how much English proficiency improves across immigrant generations. For more on English acquisition across immigrant generations, see Mary Waters and Marisa Pineau, eds., *The Integration of Immigrants into American Society* (Washington, DC: The National Academies Press, 2015).

and offer opportunities for life-long education. Together, these assets will enable workers to adapt to rapidly changing and unpredictable economic circumstances.[15]

3 Immigrant-Origin Workers and the Future of Work

What will the jobs of the future look like? While the body of research on the topic has grown quickly,[16] even before the pandemic there was no consensus on the expected pace of automation, offshoring, contract and contingent work, and other workforce trends, nor on how such trends might affect different groups of workers. With this uncertainty in mind, this section reviews the best data available on the future of work and their implications for immigrant-origin adults.

A. Projected Trends in the Future of Work

This analysis draws on three sets of projections about the future of the U.S. labor market, each of which tells a slightly different story. All three were developed before the pandemic but describe long-term trends that are likely to continue shaping the U.S. workforce.

Bureau of Labor Statistics Employment Projections

BLS regularly issues estimates of which jobs are likely to grow and decline over the coming decade, taking into consideration population projections; labor force participation rates; trends in imports, exports, offshoring, and technological change; and the spending patterns of consumers, businesses, and governments. In their projections for 2018 through 2028, BLS estimated that U.S. employment would grow by 5 percent, adding 8.4 million jobs. BLS projected the largest growth in low-skilled jobs and the smallest growth in middle-skill jobs. The four major occupational groups projected to grow the most are food preparation and serving jobs (1.5 million jobs) along with three others related to the country's aging population: personal care and service occupations (1.2 million jobs), health-care practitioners and technical occupations (1.1 million jobs), and health-care support occupations (785,000 jobs). Employment was projected to drop in only three major occupational groups: sales and related occupations (80,000 jobs), production occupations (430,000 jobs), and office and administrative support occupations (608,000 jobs). These declines reflect the ongoing shift from in-store to online shopping, as well as trends in automation and trade that have replaced office and production jobs.[17]

Projections of the Risk of Automation

Several economists have sought to estimate how many U.S. jobs could be or will be automated, defined as carried out by computers, robots, or other technologies, rather than by human workers. This report draws

15 Organization for Economic Cooperation and Development (OECD), *Good Jobs for All in a Changing World of Work: The OECD Jobs Strategy* (Paris: OECD Publishing, 2018).

16 Mark Muro, Robert Maxim, and Jacob Whiton, *Automation and Artificial Intelligence: How Machines Are Affecting People and Places* (Washington, DC: Brookings Institution, 2019); Melanie Arntz, Terry Gregory, and Ulrich Zierahn, "The Risk of Automation for Jobs in OECD Counties" (working paper no. 189, OECD Social, Employment, and Migration Working Papers, OECD Publishing, Paris, June 16, 2016); Morgan R. Frank et al., "Toward Understanding the Impact of Artificial Intelligence on Labor," *Proceedings of the National Academy of Sciences* 116, no. 14 (April 2, 2019): 6531–39.

17 BLS, "Occupational Projections and Worker Characteristics," updated September 4, 2019.

on the only study to date that has published estimates of how susceptible all individual occupations are to automation.[18] That study, authored by economist Carl Benedikt Frey and machine-learning expert Michael A. Osborne and published in 2017, analyzed the discrete tasks required for each occupation and estimated the extent to which each task can be completed by a machine or computer. The study also considered engineering bottlenecks that could impede automation. It does not predict which jobs will actually be automated within any given timeframe because the pace of automation is driven by a wide range of factors, including the cost of technology and innovation, government regulation, social preferences and pressures, and the presence of willing workers in the United States. In particular, the presence of immigrant workers willing to accept relatively low wages can reduce the economic incentives for automation.[19] Instead, the study aims to generally assess the risk of automation over the next "decade or two."[20]

According to Frey and Osborne's analysis, low-skilled jobs face a much higher risk of automation than high-skilled jobs because non-routine and cognitive tasks are more difficult to automate. The major occupational groups at highest risk of automation are food preparation and serving; farming, fishing, and forestry; and production occupations. Those at lowest risk of automation are community and social services; education, training, and library jobs; and management occupations. The COVID-19 pandemic could accelerate the pace of automation in some fields, given the demand to limit in-person interactions to reduce the spread of the virus, but it is too early to tell how this will play out.

Projections of the Risk of Offshoring

Discussions about which jobs are likely to disappear in the future also commonly focus on the role of offshoring—the process of companies shifting jobs to other countries to be completed by workers abroad rather than in the United States. There is only one comprehensive index of occupations' susceptibility to offshoring.[21] This index, developed by U.S. economist Alan Blinder and published in 2007, weighs the tasks involved in different occupations and the extent to which they require face-to-face contact or location at a particular U.S. worksite. According to this index, offshoring presents risks for both high-skilled and low-skilled jobs. Of the top four occupational groups projected to be at highest risk of offshoring, two are high skilled (computer and mathematical occupations, and architecture and engineering occupations) while two are low skilled (office and administrative support occupations, and production occupations).[22]

Some more recent data cast doubt on Blinder's offshoring projections: from 2007 through 2017, total employment in jobs flagged as highly susceptible to offshoring grew no more or less, on average, than

18 Carl Benedikt Frey and Michael A. Osborne, "The Future of Employment: How Susceptible Are Jobs to Computerisation?" *Technological Forecasting and Social Change* 114 (January 2017): 254–80. Frey and Osbourne's projections have been criticized for overestimating the share of occupations that could be automated. Taking these criticisms into account, MPI researchers relied on Frey and Osbourne's ranking of the relative risk of automation for different occupations rather than the absolute risk that they assign to any given occupation.

19 For example, economists have shown that the end of the "Bracero" temporary worker program in 1964 led farmers to mechanize harvests where possible and to switch from crops that required harvesting by hand to those that could be harvested by machines. See Michael A. Clemens, Ethan G. Lewis, Hannah M. Postel, "Immigration Restrictions as Active Labor Market Policy: Evidence from the Mexican Bracero Exclusion," *American Economic Review* 108, no. 6 (June 2018): 1468–87.

20 Frey and Osbourne, "The Future of Employment," 38.

21 Alan S. Blinder, "How Many U.S. Jobs Might Be Offshorable?" (CEPS working paper no. 142, Center for Economic Policy Studies, Princeton University, Princeton, NJ, March 2007).

22 Blinder, "How Many U.S. Jobs Might Be Offshorable?"

jobs identified as less susceptible to offshoring.[23] Nonetheless, this analysis by MPI retains an indicator of offshoring risk because that risk may materialize if offshoring accelerates as communication and transportation technologies continue to improve.

It remains to be seen whether the COVID-19 pandemic will increase or decrease the offshoring risk for U.S. jobs. Work-from-home policies during the pandemic have shown employers of many white-collar workers how well new technology can facilitate remote work, which could accelerate offshoring of some occupations.[24] But this period has also limited international travel and shown the vulnerabilities of global supply chains.[25]

A Word of Caution on Somewhat Divergent Future Scenarios

Looking at these three sets of projections around automation, offshoring, and total job growth and decline together raises some broad questions as the visions they paint of the future of work do not always align. According to BLS projections for 2018–28, made before the pandemic, most job growth will occur in low-skill occupations. But other projections suggest low-skilled jobs are highly susceptible to automation. To give one example, BLS ranks food preparation and serving second among occupations it expects to grow the most, after personal and home care aides, while other projections identify the same jobs as being at high risk for automation. It may turn out that both sets of projections are right, and some low-skilled jobs will grow in the short term but decline in the medium or long term as automation increases. In addition, some studies suggest that automation is less likely to replace entire jobs, and more likely to change the tasks involved in those jobs.[26] And policy decisions about immigration levels and the regulation of new technology, for example, may affect the relative costs of labor and technology, which may influence the speed of automation.

Economists' offshoring projections are better aligned with BLS employment projections. In general, those occupations that BLS expects to grow the most are also those projected to be at lower risk of offshoring, and occupations expected to decline or grow very slowly were those identified as at higher risk of offshoring. For the purposes of the analysis that follows, the authors accept that there is likely some truth in all three sets of projections, while acknowledging that the most uncertainty surrounds how many low-skilled jobs will remain in the U.S. economy into the future.[27]

B. Jobs of the Future and Declining Jobs

What occupations are likely to be the jobs of the future and which are likely to decline? Based on expectations of job growth or decline, automation, and offshoring, as defined in Box 3, MPI identified

23 Adam Ozimek, "Report: Overboard on Offshore Fears," Upwork, 2019. Jobs projected to have a higher offshoring risk did, however, show a significantly greater increase in the share of workers performing their jobs from home, within the United States.
24 *The Economist*, "Covid-19 Has Forced a Radical Shift in Working Habits," *The Economist*, September 12, 2020.
25 Willy C. Shih, "Global Supply Chains in a Post-Pandemic World," Harvard Business Review, September/October 2020.
26 By one estimate, at least 30 percent of tasks in 60 percent of jobs are susceptible to automation. See James Manyika, "Technology, Jobs, and the Future of Work," McKinsey Global Institute, May 24, 2017.
27 The broader literature is also mixed on this point. A 2019 analysis by the Brookings Institution challenged the assumption that only low-skilled jobs are slated to be automated, given that artificial intelligence may enable automation of high-skilled jobs as well. See Mark Muro, Jacob Whiton, and Robert Maxim, "What Jobs Are Affected by AI? Better-Paid, Better-Educated Workers Face the Most Exposure," Brookings Institution, November 20, 2019.

four broad occupational groups of the future: management occupations; health-care practitioners and technical occupations; personal and service occupations; and health-care support occupations. The four occupational groups expected to decline are office and administrative support occupations; sales and related occupations; production occupations; and farming, fishing, and forestry occupations. The characteristics of these two sets of occupational groups are shown in Table 1.

BOX 3
Identifying Jobs of the Future and Declining Jobs

Building on projections of job growth, automation, and offshoring, MPI researchers identified "jobs of the future" as well as jobs likely to decline. In each case, jobs were identified both by major occupational groups and by detailed occupations. At the occupational group level, the jobs of the future are those with the most projected job growth from 2018 through 2028 and a below-average risk of automation and offshoring. Declining jobs are those with negative or very low job growth and an above-average risk of automation and offshoring. For detailed occupations, the jobs of the future are those with projected 2018–28 job growth of at least 50,000 and below-average automation and offshoring risks, while declining jobs have projected job losses of at least 10,000 and above-average automation and offshoring risks.

Looking at the more detailed occupation level, the jobs of the future are mainly high-skilled or middle-skilled jobs (see Tables 2 and 3). In this more detailed breakdown, half of the 22 jobs of the future are high skilled, nine are middle skilled, and just two are low skilled (pipelayers, pipefitters, plumbers, and steamfitters; and nursing, psychiatric, and home health aides). Among the 32 declining jobs, only three are high skilled, four are middle skilled, and the remaining 25 are low skilled.

Commensurate with the higher skill levels required, jobs of the future offered better pay and higher job quality in 2018 than declining jobs. At the detailed occupational level, nine of the 22 jobs of the future paid more than $25 per hour, versus three of the 32 declining jobs. The benefits attached to these jobs, shown in Appendix B, also differed: 72 percent of all workers in jobs in the future reported having health insurance paid at least in part by their employer or union, compared with 61 percent of those in declining jobs. And 48 percent of workers in jobs of the future said their employer or union offered them a retirement plan, versus 38 percent of those in declining jobs. Almost all jobs in both categories were permanent; only 4.3 percent of workers in jobs of the future and 3.6 percent of those in declining jobs expected their jobs to last a year or less—the BLS definition of "contingent work."

Women held more jobs of the future and declining jobs, while men were more likely to hold jobs that fell somewhere in the middle. Among detailed occupations, women held 61 percent of jobs of the future (see Table 2), but they also comprised 66 percent of workers in declining jobs (see Table 3). In some occupations, the gender divide was more pronounced. Jobs of the future include some construction jobs in which more than 95 percent of workers were male, as well as teaching and nursing-related jobs in which more than 85 percent of workers were female.

Jobs of the future had fewer workers with limited English skills than declining jobs: 5 percent versus 10 percent. The jobs of the future with the highest LEP shares of workers were nursing, psychiatric, and home health aides and pipelayers, plumbers, pipefitters, and steamfitters (both at 12 percent of workers). The declining jobs with the highest LEP share of workers were sewing machine operators (42 percent) and maids and housekeepers (40 percent).

TABLE 1

Jobs of the Future and Declining Jobs: Major Occupational Groups, Selected Characteristics, 2018

	Total Workers	Immigrant-Origin Workers	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	BLS Projected Growth 2018–28	Automation Index (1 = Highest Risk)	Offshoring Index (100 = Highest Risk)
All Occupations	**163,910,000**	**45,772,000**	**$19.66**	**2.7**	**53%**	**9%**	**8,333,100**	**0.56**	**36.0**
Jobs of the Future									
Management	18,764,000	4,186,000	32.63	4.0	60%	4%	706,600	0.15	34.1
Health-Care Practitioners and Technical Occupations	9,656,000	2,576,000	28.62	3.6	25%	3%	1,082,200	0.16	16.7
Personal Care and Service	6,365,000	2,054,000	12.78	2.3	23%	13%	1,237,300	0.45	13.1
Health-Care Support	3,820,000	1,191,000	13.80	2.4	13%	10%	785,300	0.43	13.6
Declining Jobs									
Office and Administrative Support	18,638,000	4,367,000	16.87	2.3	28%	5%	-607,800	0.79	51.9
Sales and Related Occupations	16,778,000	4,205,000	15.64	2.5	50%	6%	-79,800	0.78	14.8
Production	9,106,000	2,874,000	17.38	2.1	71%	16%	-429,900	0.80	49.1
Farming, Fishing, and Forestry	1,273,000	606,000	12.78	1.6	74%	39%	3,200	0.83	12.5

BLS = Bureau of Labor Statistics; LEP = Limited English Proficient.

Notes: "Skill level" describes the level of education, experience, and training that jobs typically require, as categorized by BLS. This categorization ranges from 1 to 5, with 1 representing jobs that require little on-the-job experience and training (e.g., cooks and cashiers) and 5 representing jobs that require an advanced or professional degree (e.g., medical doctors and postsecondary teachers). See Appendix A for more information. The automation index is on a scale from 0 (lowest risk of automation) to 1 (highest risk of automation). The offshoring index is on a scale of 0 to 100, with 100 representing the highest risk of offshoring. Blinder assigned occupations assumed to have a very low risk of offshoring a score of "below 25." In this analysis, the authors assigned these occupations 12.5, the midpoint between 0 and 25. In some cases, the authors averaged data across several more-detailed occupations to align the BLS data with the projections made by Frey and Osbourne and by Blinder; this sometimes involved averaging occupations scoring 12.5 with those scoring higher than 25 on offshoring risk, resulting in an average score between 12.5 and 25.

Sources: The first five columns are based on MPI tabulation of data from the monthly 2018 CPS, averaged across the year. The LEP share of workers is based on MPI tabulation of data from the 2017 American Community Survey (ACS). The three sets of future projections come from BLS, "Occupational Projections and Worker Characteristics," updated September 4, 2019; Carl Benedikt Frey and Michael A. Osborne, "The Future of Employment: How Susceptible are Jobs to Computerisation?" *Technological Forecasting and Social Change* 114 (January 2017): 254–80; Alan Blinder, "How Many U.S. Jobs Might Be Offshorable?" (CEPS working paper no. 142, Center for Economic Policy Studies, Princeton University, Princeton, NJ, March 2007).

TABLE 2

Jobs of the Future: A Detailed Occupational Breakdown, Selected Characteristics, 2018

	Total Workers	Immigrant-Origin Workers	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	BLS Projected Growth 2018–28	Automation Index (1 = Highest Risk)	Offshoring Index (100 = Highest Risk)
All Jobs of the Future	**26,943,000**	**6,780,000**	**$26.79**	**3.7**	**39%**	**5%**	**148,267**	**0.13**	**12.6**
Managers (Not Otherwise Classified)	5,004,000	1,148,000	$34.40	4.1	64%	4%	68,700	0.26	12.5
Elementary and Middle School Teachers	3,577,000	564,000	$24.05	4.0	20%	2%	69,600	0.06	12.5
Registered Nurses	3,285,000	802,000	$30.67	3.0	11%	3%	371,500	0.01	12.5
Nursing, Psychiatric, and Home Health Aides	2,164,000	729,000	$12.91	2.0	11%	12%	449,500	0.40	12.5
Postsecondary Teachers	1,484,000	492,000	$30.18	4.8	51%	5%	170,500	0.03	12.5
Physicians and Surgeons	1,105,000	476,000	$42.13	5.0	60%	3%	55,400	0.00	12.5
Management Analysts	985,000	263,000	$35.86	5.0	58%	3%	118,300	0.13	12.5
Other Teachers and Instructors	968,000	233,000	$19.42	3.2	38%	4%	90,800	0.05	12.5
Counselors	931,000	176,000	$23.08	5.0	28%	2%	122,900	0.01	12.5
Electricians	925,000	249,000	$23.69	3.0	97%	9%	74,100	0.15	12.5
Social Workers	865,000	190,000	$22.95	4.5	18%	3%	81,200	0.02	12.5
Hairdressers, Hairstylists, and Cosmetologists	863,000	256,000	$13.80	3.0	8%	10%	57,800	0.11	12.5
Licensed Practical and Licensed Vocational Nurses	688,000	174,000	$19.17	3.0	12%	5%	78,100	0.06	12.5
Pipelayers, Plumbers, Pipefitters, and Steamfitters	674,000	182,000	$22.49	2.9	97%	12%	73,400	0.37	12.5
Supervisors/Managers of Construction and Extraction Workers	662,000	166,000	$24.56	3.0	96%	10%	69,100	0.17	12.5

TABLE 2 (cont.)

Jobs of the Future: A Detailed Occupational Breakdown, Selected Characteristics, 2018

	Total Workers	Immigrant-Origin Workers	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	BLS Projected Growth 2018–28	Automation Index (1 = Highest Risk)	Offshoring Index (100 = Highest Risk)
Medical and Health Services Managers	650,000	135,000	$32.61	5.0	28%	3%	71,600	0.01	12.5
Medical Assistants	593,000	187,000	$15.33	3.0	9%	6%	154,900	0.30	12.5
Recreation and Fitness Workers	540,000	109,000	$14.06	3.5	39%	3%	79,500	0.04	12.5
Physical Therapists	291,000	76,000	$36.80	5.0	31%	2%	54,200	0.02	12.5
Business Operations Specialists (Not Otherwise Classified)	249,000	72,000	$28.98	3.7	41%	4%	71,300	0.23	25.0
Nurse Practitioners	219,000	53,000	$45.46	5.0	13%	1%	54,300	0.01	12.5
Social and Human Service Assistants	219,000	47,000	$17.69	4.0	23%	4%	52,200	0.13	12.5

BLS = Bureau of Labor Statistics; LEP = Limited English Proficient.

Notes: "Skill level" describes the level of education, experience, and training that jobs typically require, as categorized by BLS. This categorization ranges from 1 to 5, with 1 representing jobs that require little on-the-job experience and training (e.g., cooks and cashiers) and 5 representing jobs that require an advanced or professional degree (e.g., medical doctors and postsecondary teachers). See Appendix A for more information. The automation index is on a scale from 0 (lowest risk of automation) to 1 (highest risk of automation). The offshoring index is on a scale of 0 to 100, with 100 representing the highest risk of offshoring. Blinder assigned occupations assumed to have a very low risk of offshoring a score of "below 25." In this analysis, the authors assigned these occupations 12.5, the midpoint between 0 and 25. In some cases, the authors averaged data across several more-detailed occupations to align the BLS data with the projections made by Frey and Osbourne and by Blinder; this sometimes involved averaging occupations scoring 12.5 with those scoring higher than 25 on offshoring risk, resulting in an average score between 12.5 and 25. Frey and Osbourne did not assign an automation index score for nurse practitioners, so MPI researchers gave that occupation the same score as registered nurses, a somewhat similar occupation.

Sources: The first five columns are based on MPI tabulation of data from the monthly 2018 CPS, averaged across the year. The LEP share of workers is based on MPI tabulation of data from the 2017 ACS. The three sets of future projections come from BLS, "Occupational Projections and Worker Characteristics"; Frey and Osborne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

TABLE 3

Declining Jobs: A Detailed Occupational Breakdown, Selected Characteristics, 2018

	Total Workers	Immigrant-Origin Workers	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	BLS Projected Growth 2018–28	Automation Index (1 = Highest Risk)	Offshoring Index (100 = Highest Risk)
All Declining Jobs	**22,812,000**	**6,513,000**	**$15.85**	**2.2**	**34%**	**10%**	**148,267**	**0.86**	**37.1**
Cashiers	3,586,000	1,110,000	$10.73	2.0	26%	9%	68,700	0.97	12.5
Retail Salespersons	3,399,000	897,000	$13.29	2.0	51%	7%	69,600	0.92	12.5
Customer Service Representatives	2,734,000	683,000	$15.33	2.0	36%	4%	371,500	0.55	67.3
Secretaries and Administrative Assistants	2,689,000	536,000	$18.86	2.4	6%	3%	449,500	0.92	38.3
Maids and Housekeeping Cleaners	1,640,000	1,005,000	$11.45	2.0	10%	40%	170,500	0.69	12.5
General Office Clerks	1,386,000	367,000	$16.36	2.0	16%	5%	55,400	0.96	67.3
Miscellaneous Assemblers and Fabricators	1,140,000	345,000	$16.36	2.0	63%	16%	118,300	0.97	13.4
Bookkeeping, Accounting, and Auditing Clerks	1,086,000	199,000	$18.40	3.0	13%	5%	90,800	0.98	84.0
Inspectors, Testers, Sorters, Samplers, and Weighers	846,000	210,000	$18.66	2.0	63%	10%	122,900	0.98	60.0
Computer Programmers	492,000	192,000	$39.32	4.0	79%	6%	74,100	0.48	100.0
Metalworkers and Plastic Workers (Not Otherwise Classified)	426,000	139,000	$17.38	2.8	82%	20%	81,200	0.83	68.4
Bailiffs, Correctional Officers, and Jailers	419,000	68,000	$17.69	2.0	71%	2%	57,800	0.59	12.5
Claims Adjusters, Appraisers, Examiners, and Investigators	351,000	55,000	$25.05	3.9	43%	2%	78,100	0.98	12.5

TABLE 3 (cont.)

Declining Jobs: A Detailed Occupational Breakdown, Selected Characteristics, 2018

	Total Workers	Immigrant-Origin Workers	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	BLS Projected Growth 2018–28	Automation Index (1 = Highest Risk)	Offshoring Index (100 = Highest Risk)
Postal Service Mail Carriers	312,000	76,000	$21.21	2.0	60%	5%	73,400	0.68	12.5
Tellers	311,000	78,000	$14.31	2.0	15%	4%	69,100	0.98	12.5
Data Entry Keyers	289,000	78,000	$16.36	2.0	23%	4%	71,600	0.99	100.0
Purchasing Agents (Except Wholesale Retail and Farm Products)	259,000	39,000	$27.03	4.0	54%	2%	154,900	0.77	12.5
Sewing Machine Operators	190,000	115,000	$12.78	1.0	27%	42%	79,500	0.89	75.0
Printing Machine Operators	174,000	47,000	$17.89	3.0	78%	11%	54,200	0.83	57.0
File Clerks	173,000	43,000	$15.49	2.0	23%	4%	71,300	0.97	50.0
Hotel, Motel, and Resort Desk Clerks	143,000	42,000	$12.78	2.0	32%	5%	54,300	0.94	12.5
Bill and Account Collectors	132,000	28,000	$17.82	2.0	29%	3%	52,200	0.95	65.0
Electrical, Electronics, and Electromechanical Assemblers	132,000	53,000	$14.46	2.0	51%	24%	52,201	0.95	14.8
Postal Service Clerks	123,000	29,000	$17.95	2.0	46%	9%	52,202	0.95	12.5
Word Processors and Typists	75,000	21,000	$21.10	2.0	13%	7%	52,203	0.81	94.0
Telemarketers	67,000	11,000	$13.27	2.0	34%	4%	52,204	0.99	95.0
Cutting, Punching, and Press Machine Setters, Operators, and Tenders (Metal and Plastic)	64,000	12,000	$18.40	2.0	91%	11%	52,205	0.78	68.0

TABLE 3 (cont.)

Declining Jobs: A Detailed Occupational Breakdown, Selected Characteristics, 2018

	Total Workers	Immigrant-Origin Workers	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	BLS Projected Growth 2018–28	Automation Index (1 = Highest Risk)	Offshoring Index (100 = Highest Risk)
Postal Service Mail Sorters, Processors, and Processing Machine Operators	60,000	13,000	$21.83	2.0	42%	9%	52,206	0.79	25.0
Molders and Molding Machine Setters, Operators, and Tenders (Metal and Plastic)	44,000	13,000	$21.47	2.0	89%	10%	52,207	0.93	67.7
Structural Metal Fabricators and Fitters	34,000	8,000	$19.02	3.0	100%	6%	52,208	0.41	68.0
Switchboard Operators, Including Answering Services	23,000	2,000	$15.73	2.0	20%	2%	52,209	0.96	50.0
Purchasing Agents and Buyers (Farm Products)	12,000	2,000	$24.57	4.0	67%	11%	52,210	0.87	12.5

BLS = Bureau of Labor Statistics; LEP = Limited English Proficient.

Notes: "Skill level" describes the level of education, experience, and training that jobs typically require, as categorized by BLS. This categorization ranges from 1 to 5, with 1 representing jobs that require little on-the-job experience and training (e.g., cooks and cashiers) and 5 representing jobs that require an advanced or professional degree (e.g., medical doctors and postsecondary teachers). See Appendix A for more information. The automation index is on a scale from 0 (lowest risk of automation) to 1 (highest risk of automation). The offshoring index is on a scale of 0 to 100, with 100 representing the highest risk of offshoring. Blinder assigned occupations assumed to have a very low risk of offshoring a score of "below 25." In this analysis, the authors assigned these occupations 12.5, the midpoint between 0 and 25. In some cases, the authors averaged data across several more-detailed occupations to align the BLS data with the projections made by Frey and Osbourne and by Blinder; this sometimes involved averaging occupations scoring 12.5 with those scoring higher than 25 on offshoring risk, resulting in an average score between 12.5 and 25.

Sources: The first five columns are based on MPI tabulation of data from the monthly 2018 CPS, averaged across the year. The LEP share of workers is based on MPI tabulation of data from the 2017 ACS. The three sets of future projections come from BLS, "Occupational Projections and Worker Characteristics"; Frey and Osborne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

C. *Where Do Immigrant-Origin Workers Fit In?*

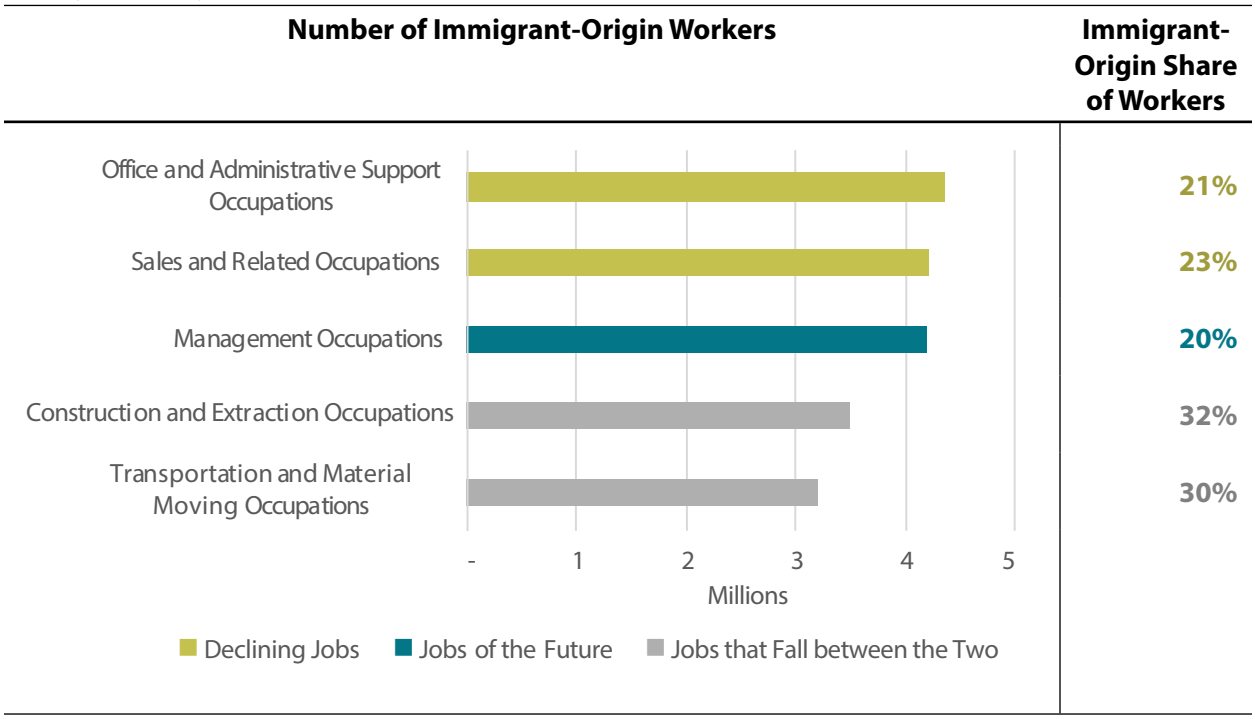
In 2018, immigrant-origin workers were distributed across declining jobs and jobs of the future at similar rates to third/higher-generation workers. Twenty-six percent of immigrant-origin workers were in the four major occupational groups most likely to decline, while 22 percent were in those projected to grow the most, compared to 29 percent and 24 percent, respectively, for third/higher-generation workers.

Twenty-six percent of immigrant-origin workers were in the four major occupational groups most likely to decline, while 22 percent were in those projected to grow the most.

The two major occupational groups with the most immigrant-origin workers were both projected to decline: office and administrative support occupations, and sales and related occupations (see Figure 4). However, the group with the third most immigrant-origin workers—management occupations—was projected to grow rapidly. Among the fifteen detailed occupations with the most immigrant-origin workers, shown in Figure 5, three were jobs of the future, four were declining jobs, and the rest fell somewhere in between.

FIGURE 4

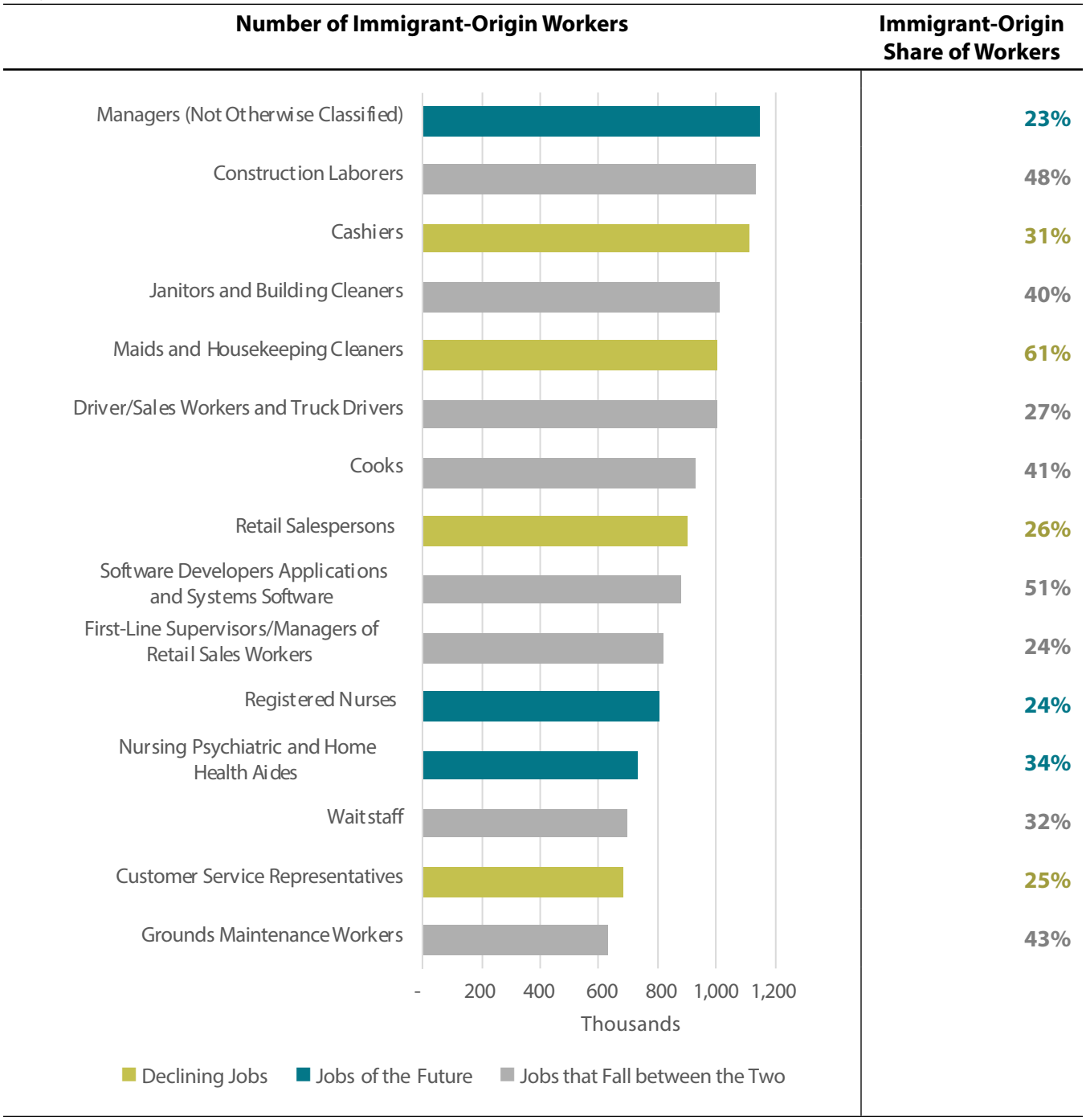
Number and Share of Immigrant-Origin Workers in the Major Occupational Groups with the Most Immigrant-Origin Workers, 2018



Source: MPI tabulation of data from the monthly 2018 CPS, averaged across the year; BLS, "Occupational Projections and Worker Characteristics"; Frey and Osborne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

FIGURE 5

Number and Share of Immigrant-Origin Workers in the Detailed Occupations with the Most Immigrant-Origin Workers, 2018



Source: MPI tabulation of data from the monthly 2018 CPS, averaged across the year; BLS, "Occupational Projections and Worker Characteristics"; Frey and Osborne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

Many workers in declining jobs may find it takes substantial effort to transition to jobs of the future. The declining jobs in which immigrant-origin workers were concentrated in 2018 tend to be low-skilled occupations, while most jobs of the future were middle or high skilled. Making the leap from lower-skilled to middle- or higher-skilled work would likely require obtaining additional educational or professional credentials, training, or experience. For some, it might also require building stronger English skills. In addition, many of the jobs of the future are in health care and education; these fields are highly regulated, often requiring training or credentials that foreign-trained workers may lack and excluding immigrants without work authorization. Tables 4 and 5 show additional characteristics of the major occupational groups and detailed occupations with the highest numbers of immigrant-origin workers, highlighting those MPI has classified as jobs of the future (dark teal) and declining jobs (light green).

TABLE 4

Top Major Occupational Groups for Immigrant-Origin Workers, Selected Characteristics, 2017/2018

	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	Share of Workers Eligible for Employer- or Union-Sponsored Health Insurance	Share with Retirement Plan Available through Employer or Union	Contingent Share of Workers
All Occupations	**$19.66**	**2.7**	**53%**	**9%**	**65%**	**40%**	**4%**
Office and Administrative Support	$16.87	2.3	28%	5%	70%	45%	4%
Sales and Related Occupations	$15.64	2.5	50%	6%	55%	32%	2%
Management	$32.63	4.0	60%	4%	71%	42%	1%
Construction and Extraction	$19.98	2.2	97%	21%	49%	27%	8%
Transportation and Material Moving	$15.73	2.0	82%	13%	62%	37%	5%

LEP = Limited English Proficient.

Notes: Occupations shaded light green are declining jobs, occupations shaded dark teal are jobs of the future, and occupations that are not shaded fall in between these two categories. "Skill level" describes the level of education, experience, and training that jobs typically require, as categorized by BLS. This categorization ranges from 1 to 5, with 1 representing jobs that require little on-the-job experience and training (e.g., cooks and cashiers) and 5 representing jobs that require an advanced or professional degree (e.g., medical doctors and postsecondary teachers). See Appendix A for more information. Contingent workers are those who expect their jobs to last for no longer than an additional year.

Sources: The first three columns are based on MPI tabulation of data from the monthly 2018 CPS, averaged across the year. The LEP share of workers is based on MPI tabulation of data from ACS 2017. The contingent share of workers is based on data from the 2017 CPS Contingent Worker Supplement. Health insurance and retirement plan data are based on the 2018 CPS March Supplement. Definitions of jobs of the future and declining jobs are based on BLS, "Occupational Projections and Worker Characteristics"; Frey and Osbourne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

TABLE 5

Top Detailed Occupations for Immigrant-Origin Workers, Selected Characteristics, 2017/2018

	Median Hourly Wage	Skill Level	Male Share of Workers	LEP Share of Workers	Share of Workers Eligible for Employer- or Union-Sponsored Health Insurance	Share with Retirement Plan Available through Employer or Union	Contingent Share of Workers
All Occupations	**$19.66**	**2.7**	**53%**	**9%**	**65%**	**40%**	**4%**
Managers (Not Otherwise Classified)	$34.40	4.1	64%	4%	68%	41%	2%
Construction Laborers	$17.89	2.0	96%	29%	38%	17%	10%
Cashiers	$10.73	2.0	26%	9%	36%	24%	3%
Janitors and Building Cleaners	$13.29	2.0	66%	21%	56%	36%	2%
Maids and Housekeeping Cleaners	$11.45	2.0	10%	40%	38%	18%	4%
Driver/Sales Workers and Truck Drivers	$18.15	2.0	93%	12%	61%	34%	3%
Cooks	$11.50	1.8	58%	22%	44%	23%	2%
Retail Salespersons	$13.29	2.0	51%	7%	51%	32%	3%
Software Developers (Applications and Systems Software)	$44.73	4.0	81%	7%	91%	48%	2%
First-Line Supervisors/Managers of Retail Sales Workers	$18.22	2.0	55%	6%	64%	36%	1%
Registered Nurses	$30.67	3.0	11%	3%	88%	57%	2%
Nursing, Psychiatric, and Home Health Aides	$12.91	2.0	11%	12%	60%	37%	2%
Waitstaff	$12.27	2.0	30%	9%	33%	17%	6%
Customer Service Representatives	$15.33	2.0	36%	4%	69%	41%	4%
Grounds Maintenance Workers	$13.45	1.1	93%	26%	32%	19%	10%

LEP = Limited English Proficient.

Notes: Occupations shaded light green are declining jobs, occupations shaded dark teal are jobs of the future, and occupations that are not shaded fall in between these two categories. "Skill level" describes the level of education, experience, and training that jobs typically require, as categorized by BLS. This categorization ranges from 1 to 5, with 1 representing jobs that require little on-the-job experience and training (e.g., cooks and cashiers) and 5 representing jobs that require an advanced or professional degree (e.g., medical doctors and postsecondary teachers). See Appendix A for more information. Contingent workers are those who expect their jobs to last for no longer than an additional year.

Sources: The first three columns are based on MPI tabulation of data from the monthly 2018 CPS, averaged across the year. The LEP share of workers is based on MPI tabulation of data from ACS 2017. The contingent share of workers is based on data from the 2017 CPS Contingent Worker Supplement. Health insurance and retirement plan data are based on the 2018 CPS March Supplement. Definitions of jobs of the future and declining jobs are based on BLS, "Occupational Projections and Worker Characteristics"; Frey and Osbourne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

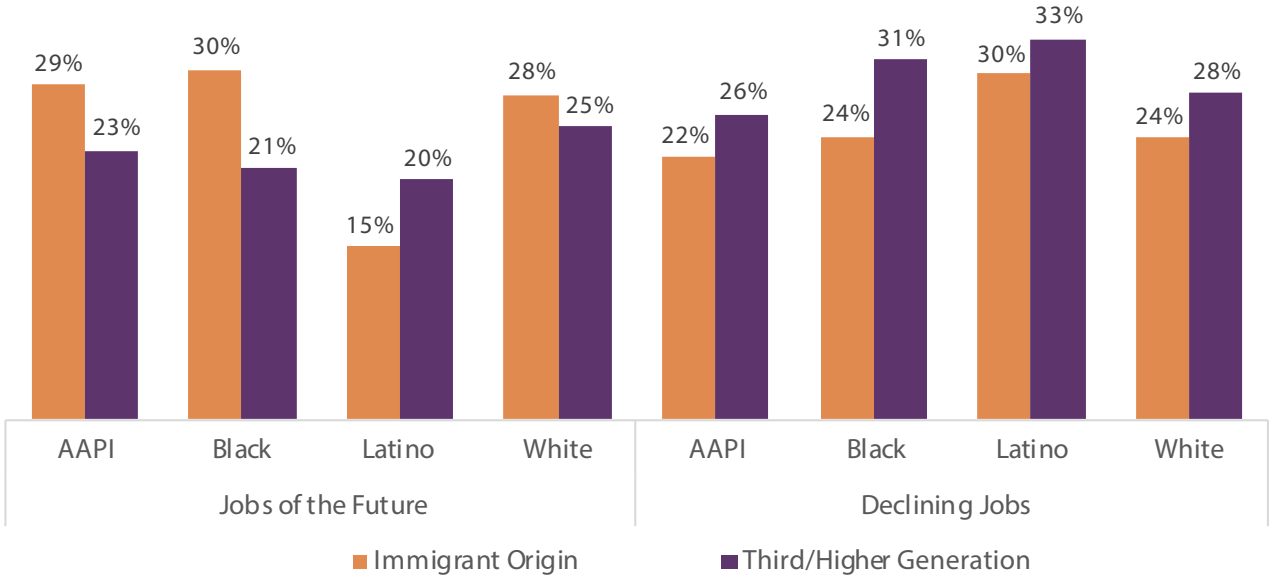
D. Race and Ethnicity and the Future of Work

The research literature reveals racial and ethnic disparities in how automation is expected to affect U.S. workers, with Black and Latino workers more highly concentrated in jobs at high risk of automation than White and Asian American and Pacific Islander (AAPI) workers.[28] This section will go a step further to examine whether workers in these major racial/ethnic groups are of immigrant origins.

The changing nature of work poses a particular challenge for Latino workers. As of 2018, both immigrant-origin and third/higher-generation Latinos worked at high rates in declining jobs and at low rates in jobs of the future (see Figure 6). For Black workers, this picture varied more by immigrant generation. Immigrant-origin Black workers held jobs of the future at relatively high rates and declining jobs at relatively low rates compared to other groups, while third/higher-generation Black workers exhibited the opposite pattern. This likely reflects the fact that the United States tends to attract highly skilled Black immigrants, particularly those from Africa who must have the resources to travel great distances, those who qualify for diversity visas that require at least a high school education, and those who come from countries where English is commonly spoken, such as Nigeria, Ghana, and Kenya.[29] At the same time, the long history of racial segregation and discrimination in the United States has limited opportunities and mobility for Black workers—particularly those born in the United States—putting them at a disadvantage in the labor market.

FIGURE 6

Share of Immigrant-Origin and Third/Higher-Generation Workers in Jobs of the Future and Declining Jobs, by Race/Ethnicity, 2018



Note: "Jobs of the future" and "declining jobs" are defined based on the major occupational groups available in the CPS. See Box 3 for more information.
Source: MPI tabulation of data from the monthly 2018 CPS, averaged across the year; BLS, "Occupational Projections and Worker Characteristics"; Frey and Osbourne, "The Future of Employment"; Blinder, "How Many U.S. Jobs Might Be Offshorable?"

28 Broady, "Race and Jobs at High Risk to Automation."
29 Carlos Echeverria-Estrada and Jeanne Batalova, "Sub-Saharan African Immigrants in the United States," *Migration Information Source*, November 6, 2019; Randy Capps, Kristen McCabe, and Michael Fix, *New Streams: Black African Migration to the United States* (Washington, DC: MPI, 2011).

The patterns of employment by immigrant generation also vary somewhat for White and AAPI workers. In 2018, White and AAPI immigrant-origin workers held jobs of the future at higher rates and declining jobs at lower rates than immigrant-origin workers overall. White and AAPI third/higher-generation workers were about as likely as all third/higher-generation workers to hold jobs of the future.

E. Changes in the Quality of Jobs

Discussions about the future of work have focused not only on projections about growth, automation, and offshoring but also on concerns about job quality. In the pre-COVID-19 context of stagnating wages for many U.S. workers,[30] the emergence of the gig economy, and a broad perception that nonstandard, contract positions were increasing, some economists predicted that future workers will no longer have steady, full-time, long-term jobs with a couple of employers over the course of their working years; instead, they predicted workers will cycle in and out of jobs or work as independent contractors, lending their services to many different customers over time. It is too early to know how the pandemic might affect these predictions. Businesses experiencing reduced revenues and facing uncertain prospects might reduce labor costs by using contract labor or gig workers instead of regular employees. Moreover, high unemployment gives employers more negotiating power relative to workers, who may be more willing to accept positions that lack security or benefits.

This move away from a more formal, single-employer structure can take several forms: working on contract instead of being a regular employee, being misclassified as a contractor while actually working directly for an employer, involuntary or unstable part-time work, and employment in the informal economy. Each of these has implications for immigrant-origin workers, as will be discussed below.

Contract Work

In the mid-2010s, small-scale surveys found that Americans were more likely to report being contractors than during the mid-1990s.[31] Contractors include self-employed freelancers, workers on limited-duration contracts for another person or a company, and those who work for a contracting company. These survey findings fueled speculation that companies were shedding employees and replacing them with contract workers. The findings also drove concerns that the quality of jobs was declining, given that contract work generally does not provide workers with benefits such as paid sick leave, health insurance, and retirement benefits.[32]

A nationwide survey conducted in 2017 by BLS, however, showed that contract work was rare and had changed little since BLS asked the same questions in 2005.[33] Over this period, the share of U.S. workers who reported being independent contractors fell slightly from 7.4 percent to 6.9 percent, while the share

30 Pia Orrenius, Madeline Zavodny, and Stephanie Gullo, *How Does Immigration Fit into the Future of the U.S. Labor Market?* (Washington, DC: MPI, 2019).

31 See, for example, Marist Poll, "NPR/Marist Poll Results January 2018: Picture of Work," accessed October 2, 2020; Lawrence F. Katz and Alan B. Krueger, 2016, "The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015" (NBER Working Paper No. 22667, National Bureau of Economic Research, Cambridge, MA, September 2016).

32 See, for example, David Weil, *The Fissured Workplace: Why Work Became So Bad for So Many and What Can Be Done to Improve It* (Cambridge, MA: Harvard University Press, 2014).

33 MPI analysis of data from the 2017 CPS Contingent Worker Supplement.

employed by a temporary help agency held steady at 0.9 percent. Immigrant-origin workers held both types of positions at similar rates to third/higher-generation workers in 2017. The 2017 BLS survey also asked for the first time about "gig" work—that is, short-term, task-based work, arranged through an online platform—finding that just 1 percent of U.S. workers engaged in such work.

A rising number of U.S. workers reports self-employment income to the Internal Revenue Service each year on top of income from their primary jobs.

The surprising finding that contract work was not on the rise led the authors of an influential, earlier study to issue a correction, stating that the increase in nontraditional work arrangements was likely much smaller than they had first thought.[34] However, this interpretation of the 2017 BLS survey has been critiqued because it only considered respondents' *primary* jobs. A rising number of U.S. workers reports self-employment income to the Internal Revenue Service each year on top of income from their primary jobs, meaning that more of them hold gig or other contract positions in addition to primary jobs.[35] It may be that more workers are taking on second jobs with less formal arrangements because their primary jobs do not pay enough to adequately support them and their families.

Misclassification of Regular Employees as Subcontractors

Of particular concern is that employers sometimes improperly classify their regular employees as independent contract workers. According to the Internal Revenue Service, workers are properly classified as self-employed contractors if the person contracting their work directs the outcome of the work but not the process.[36] Yet, employers who establish contracting arrangements with workers often still exert full control over these workers' daily tasks. Misclassification allows employers to avoid paying payroll taxes, workers' compensation insurance, and benefits such as health coverage, and exempts them from complying with federal wage and hour regulations.

The extent of worker misclassification is difficult to determine. A thorough review of state-level studies suggested that between 10 percent and 30 percent of employers misclassify at least some of their workers.[37] There are also no solid data to indicate whether misclassification is on the rise. The evidence that does exist suggests that immigrant-origin workers, especially foreign-born workers, may be more likely to suffer from misclassification. In a 2014 investigation of payroll records for workers on federally funded

34 Lawrence F. Katz and Alan B. Krueger, 2019, "Understanding Trends in Alternative Work Arrangements in the United States" (NBER Working Paper No. 25425, National Bureau of Economic Research, Cambridge, MA, January 2019). The authors also noted, however, that the CPS may undercount contract work to a small extent. The CPS allows household members to answer the survey for others in the household. The incidence of contract work reported in these proxy interviews was lower than in self-reports, suggesting that respondents may misreport the work arrangements of other household members, assuming that they work in traditional employment situations when they do not.

35 Brett Collins et al., "Is Gig Work Replacing Traditional Employment? Evidence from Two Decades of Tax Returns" (working paper, Internal Revenue Services, Washington, DC, March 25, 2019). For further discussion of the limitations of CPS data, see David Weil, Heidi Shierholz, Robert Kuttner, and John Schmitt, "The Future of Real Jobs: A Prospect Roundtable," The American Prospect, May 14, 2019.

36 Internal Revenue Service, "Independent Contractor Defined," updated January 23, 2020.

37 Catherine Ruckelshaus and Ceilidh Gao, "Independent Contractor Misclassification Imposes Huge Costs on Workers and Federal and State Treasuries" (fact sheet, National Employment Law Project, New York, September 2017).

construction projects in 27 states, foreign-born workers were more often misclassified than U.S.-born workers.[38] Immigrant workers are also more concentrated in the types of industries where misclassification is common, for instance in janitorial services, construction, and hotels.[39] Moreover, employers may opt to hire unauthorized immigrants as contractors because they are not required to verify contractors' immigration status as they are for their regular employees.

Precarious Work

The term "precarious" is used for a wide range of job arrangements, including those that are temporary, involuntarily part time, performed on call or by daily hire, on contract, and those that have unstable or unpredictable work hours.[40] Precarious work may offer limited possibility for advancement, limited worker protections, and few benefits such as health insurance or paid leave. It has been linked to lower incomes and material hardship, as well as to poorer health for workers, particularly those with unstable schedules.[41]

According to a 2015 review of national surveys and smaller-scale studies conducted between 2005 and 2010, an estimated 5 percent to 8 percent of U.S. workers had work schedules that were variable, unpredictable, or both, including on-call workers, day laborers, and those employed by temporary work agencies.[42] The 2017 CPS included only one measure of precarious work: whether workers expected their jobs to last no longer than a year (i.e., contingent work). That survey found that 4 percent of U.S. workers expected their primary job to last no longer than a year, about the same share as in 2005. Immigrant-origin workers were slightly more likely than third/higher-generation workers to have this expectation: 5 percent versus 3 percent as of 2017.[43]

Informal Work

Informal economic activities are those hidden from the government. They happen "under the table" or "off the books," often to avoid taxes, licensing requirements, or other government mandates. The prevalence of informal work is very difficult to measure, making it hard to assess whether it is on the rise. In its latest estimates, the International Labor Organization calculated that informal employment made up 19 percent of total employment in the United States in 2013, higher than in Northern and Western European countries, but lower than much of the rest of the world.[44]

Some research suggests that immigration is not the largest factor behind the size of the informal economy in a U.S. state, but there is a significant correlation between the presence of more immigrants and higher rates of informal work, particularly in construction and landscaping. Potential explanations for this

38 Franco Ordoñez and Mandy Locke, "Immigrants Are Most Susceptible to Worker Misclassification," McClatchy, September 4, 2014.
39 Daniel Fisher, "Is Your Company On The Independent Contractor Hit List?," *Forbes,* June 15, 2015.
40 Arne L. Kalleberg, "Measuring Precarious Work" (working paper, Employment, Instability, Family Well-Being, and Social Policy Network, University of Chicago School of Social Service Administration, Chicago, November 2014).
41 Daniel Schneider and Kristen Harknett, "Hard Times: Routine Schedule Unpredictability and Material Hardship among Service Sector Workers" (working paper, Washington Center for Equitable Growth, Washington, DC, October 16, 2019).
42 U.S. Government Accountability Office (GAO), *Contingent Workforce: Size, Characteristics, Earnings, and Benefits* (Washington, DC: GAO, 2015). This study reviewed data from the CPS, the General Social Survey, and the Survey of Income and Program Participation.
43 MPI analysis of data from the 2017 CPS Contingent Worker Supplement.
44 International Labor Organization (ILO), *Women and Men in the Informal Economy: A Statistical Picture*, 3rd Edition (Geneva: ILO, 2018).

correlation include limited formal employment opportunities for unauthorized immigrants and informal economies in neighborhoods with large numbers of immigrant residents, where immigrant-run and immigrant-staffed endeavors are built on trust between members of the same ethnic or cultural groups.[45] However, other factors, including greater government regulation and taxes and less investment in labor-law enforcement are also correlated with larger informal economies.[46] Many unauthorized immigrants do hold formal jobs where their employers list them on the employment roster, pay the required taxes, and otherwise comply with government regulations.[47]

Overall, the majority of U.S. workers—those of immigrant origins and the third/higher generation alike—work in traditional, formal employment, with jobs expected to last for at least another year. There is little evidence to suggest a sharp rise in the prevalence of contract or limited-duration work. Still, immigrant-origin workers are slightly overrepresented in contingent work, more likely to be misclassified as contractors, and may be more likely to work in the informal economy. Therefore, even if the nature of work looks the same in the coming decades as it does today, nonstandard work arrangements may continue to challenge the economic security of immigrant-origin workers and their families.

Immigrant-origin workers are slightly overrepresented in contingent work, more likely to be misclassified as contractors, and may be more likely to work in the informal economy.

4 Conclusion

Predictions about the future of work in the United States have mostly overlooked how different trends will affect immigrant-origin workers, even though these immigrants and their U.S.-born children comprised 28 percent of the U.S. workforce in 2018 and are expected to account for all growth in the working-age population over the next 15 years. Understanding how the changing mix of jobs in the U.S. economy is likely to affect this key segment of workers will be vital for shaping workforce development and immigration policies in the years ahead.

Analysis of the economic dynamics shaping employment suggests that big changes may be on the horizon for the occupational mix in United States. If projections about automation are correct, the future U.S. workforce will demand higher levels of skills, training, and interpersonal capabilities. High- and middle-skilled jobs in health care, education, management, and social services are projected to grow the most. At the same time, some low-skilled jobs in health care and personal services are also expected to expand. But many low-skilled jobs, those requiring repetitive physical tasks, and those in industries disrupted by

45 Sarah Bohn and Emily Greene Owens, "Immigration and Informal Labor," *Industrial Relations: A Journal of Economy and Society* 51, no. 4 (October 2012): 845–73.

46 Friedrich Schneider and Dominik H. Enste, *The Shadow Economy: An International Survey*, 2nd Edition (Cambridge: Cambridge University Press, 2016).

47 The clearest evidence that many unauthorized immigrants are on employers' payroll systems comes from the Social Security Administration (SSA), which tracks Social Security payroll contributions made using a false Social Security number or a real Social Security number that is used in conjunction with the wrong name. See Stephen Goss et al., "Effects of Unauthorized Immigration on the Actuarial Status of the Social Security Trust Funds" (Actuarial Note No. 151, Social Security Administration, Office of the Chief Actuary, Baltimore, MD, April 2013).

automation—such as brick-and-mortar retail and office support occupations—are expected to decline. The pandemic may accelerate automation and the resulting decline in such jobs, especially those in hospitality—the industry showing the steepest drop in employment since the pandemic began in early 2020. For example, some hotels are now having guests check in via a computer rather than a receptionist and employing robots rather than staff to deliver items and meals to rooms.[48] In factories and warehouses, social distancing and safety measures can be costly and may incentivize deeper investments in mechanizing work.[49] Some of these employer investments in new modes of operation could shape their approach to employment in the longer term.

The occupational trends discussed in this report are likely to affect some workers more than others. Women, for example, were more concentrated than men in both growing and declining jobs, while jobs held predominantly by men tended to fall in between the two categories. Latino and Black third/higher-generation workers were overrepresented in declining jobs, compared to their White and APPI counterparts and to immigrant-origin workers of all major racial/ethnic groups.

Among immigrant-origin workers, those most likely to be left behind include the 52 percent with no more than a high school education[50] and the 32 percent with limited English proficiency. Further, given that many of the jobs of the future are in highly regulated fields such as health care, education, and social services, internationally trained professionals may need assistance in getting foreign credentials recognized, obtaining recognized U.S. credentials, or acquiring U.S. work experience. At the same time, many immigrant-origin workers' bilingual skills will likely present opportunities in an increasingly diverse country and globally integrated world.[51]

The pace of these changes is uncertain, especially in light of the labor market dislocations brought by the COVID-19 pandemic.

The pace of these changes is uncertain, especially in light of the labor market dislocations brought by the COVID-19 pandemic. Many of the jobs expected to grow over the coming decade, including many that are low skilled, are also projected to be at high risk of automation. But whether and when that automation will happen is unclear, given how many factors affect the pace of technological change and of businesses' acceptance of new technology. In particular, sustained high levels of immigration could forestall the adoption of technology by lowering the cost of labor in some industries, while changes in consumer demand and behavior could accelerate automation, as in the shift from in-person to online shopping.

48 Kaitlyn McInnis, "Creative Ways Hotels Are Adapting and Altering On-Site Amenities in Response to COVID-19," *Forbes,* July 29, 2020.

49 Jacob Bunge and Jesse Newman, "Tyson Turns to Robot Butchers, Spurred by Coronavirus Outbreaks," *The Wall Street Journal*, July 9, 2020; Bryan Walsh, "Coronavirus Speeds the Way for Robots in the Workplace," Axios, April 25, 2020.

50 Jeanne Batalova and Michael Fix, *Credentials for the Future: Mapping the Potential for Immigrant-Origin Adults in the United States* (Washington, DC: MPI, 2019)

51 For example, a survey of 289 public and private employers in California found that the majority of employers were seeking bilingual employees among new hires. See Diana A. Porras, Jongyeon Ee, and Patricia Gándara, "Employer Preferences: Do Bilingual Applicants and Employees Experience an Advantage?" in *The Bilingual Advantage Language, Literacy and the US Labor Market,* eds. Rebecca M. Callahan and Patricia C. Gándara (Clevedon, UK: Multilingual Matters, 2014), 236–62.

While the future occupational mix of the U.S. labor force is likely to be quite different than the mix today, it is less clear whether the nature of employment itself will change as much as some observers have predicted. The majority of U.S. workers continue to hold a primary job as a full employee of the company that hires them, rather than relying primarily on contract or contingent work. All the same, immigrant-origin workers are slightly overrepresented in limited-duration jobs, and there is evidence that they are disproportionately misclassified as contract workers and overrepresented in informal work. Whether the pandemic and associated recession will engender a further shift toward informal, contract, or contingent work is uncertain, but bears watching.

Taken together, these trends in the future of work have implications for the preparation and training of U.S. workers. Many immigrant-origin and third/higher-generation workers alike will need to adapt to succeed in the changing labor market. Education, workforce training, and credentialing programs should be tailored to prepare workers for the jobs that are predicted to remain in demand—particularly those in health care, education, management, and other service occupations—as well as to help workers build general skills (e.g., problem-solving and life-long learning) and communication and digital literacy skills that can be helpful across an evolving array of jobs.[52] LEP workers will benefit from access to programs that combine English language learning with vocational training to likewise prepare them for a wide range of careers likely to be available in the future.[53] The national-level findings presented in this report should be combined with state and local analyses and consultation with employers to ensure that workers are being prepared for jobs that will benefit both them and their local communities in the years to come.[54]

A better understanding of which U.S. jobs are likely to decline and which are likely to grow should also inform U.S. immigrant selection policies. Currently, employers identify which workers are worth the time and cost to sponsor for both temporary and permanent admission, but the permanent employment-based immigration system is largely focused on filling high-skilled jobs. Temporary work visas are available for both high-skilled workers (computer scientists and physicians, for example) and workers in low-skilled, short-term, and seasonal jobs, such as picking crops and working at summer resorts; they are not available for workers in the growing, year-round low- and middle-skilled jobs of the future identified in this study, such as nursing and home health aides, plumbers, and teachers and instructors. In other work, MPI has proposed creating a new temporary-to-permanent visa pathway (a "provisional" or "bridge" visa) to allow for employer-sponsored immigration across skill levels and better align employment-based immigration with U.S. workforce needs.[55] Bridge visas would allow workers in high-demand jobs, regardless of skill level,

52 Steve Lohr, "The Pandemic Has Accelerated Demands for a More Skilled Work Force," *The New York Times*, July 13, 2020.

53 Margie McHugh and Catrina Doxsee, *English Plus Integration: Shifting the Instructional Paradigm for Immigrant Adult Learners to Support Integration Success* (Washington, DC: MPI, 2018).

54 One tool available for such analyses is the Atlanta Federal Reserve Bank's Opportunity Occupations Monitor, which displays the number of workers and characteristics of jobs by state, categorized by the skill level required, so that users can search for common jobs in their state that do not require a college degree and look at the wages and projected growth for those occupations. See Atlanta Federal Reserve Bank, "Opportunity Occupations Monitor," updated August 7, 2020.

55 Demetrios G. Papademetriou, Doris Meissner, Marc R. Rosenblum, and Madeleine Sumption, *Aligning Temporary Immigration Visas with U.S. Labor Market Needs: The Case for a New System of Provisional Visas* (Washington, DC: MPI, 2009).

to enter the country on a temporary visa and, if they remain gainfully employed in the U.S. labor market for several years and follow U.S. laws, to transition to permanent residency.[56] Selection policies should also take into account workers' broad and transferrable skills in order to admit those likely to be most successful in adapting to future job market changes.[57] The precise admissions criteria for bridge visas could be adjusted over time to reflect new data on labor market trends based on analysis by an independent body of experts (what MPI has called a "Standing Commission on Immigration and Labor Markets").[58]

Amid declining U.S. birth rates and the aging of the population, immigrant-origin workers will play a critical role in the future of the U.S. labor force. In the short term, as the country endures the economic contraction brought on by the pandemic, there may be limited appetite for bringing new foreign-born workers to the United States. But as the economy recovers, training for immigrant-origin and other U.S. workers and policies that select immigrants with the skills to fill the jobs of the future will be essential to the country's economic vitality.

As the economy recovers, training for immigrant-origin and other U.S. workers and policies that select immigrants with the skills to fill the jobs of the future will be essential to the country's economic vitality.

56 Papademetriou, Meissner, Rosenblum, and Sumption, *Aligning Temporary Immigration Visas with U.S. Labor Market Needs*.

57 Demetrios G. Papademetriou, Meghan Benton, and Kate Hooper, *Equipping Immigrant Selection Systems for a Changing World of Work (Transatlantic Council Statement)* (Washington, DC: MPI, 2019).

58 Doris Meissner, Deborah W. Meyers, Demetrios G. Papademetriou, and Michael Fix, *Immigration and America's Future: A New Chapter* (Washington, DC: MPI, 2006); Demetrios G. Papademetriou, Doris Meissner, Marc R. Rosenblum, and Madeleine Sumption, *Harnessing the Advantages of Immigration for a 21st-Century Economy: A Standing Commission on Labor Markets, Economic Competitiveness, and Migration* (Washington, DC: MPI, 2009).

Appendices

Appendix A. Data Sources and Approach

To conduct the analyses in this report, Migration Policy Institute (MPI) researchers compiled information from several data sources. The authors drew a wide range of sociodemographic and economic variables from the U.S. Census Bureau's datasets to describe the immigrant-origin population in the U.S. labor market. The researchers also analyzed economic projections from the U.S. Department of Labor's Bureau of Labor Statistics (BLS), projections about offshoring by economist Alan Blinder, and projections about automation by economist Carl Benedikt Frey and machine-learning expert Michael A. Osborne.[59] The resulting database captures trends in employment and self-employment, demographics, wages, skill types, and projections of future employment, automation, and offshoring by major occupational groups and by more detailed occupations. This section describes the data sources used and discusses their advantages and limitations.

U.S. Census Bureau Data Sources

The central data source for the analysis was the U.S. Census Bureau's 2018 Current Population Survey (CPS), with monthly data averaged across the year.[60] The CPS has a nationally representative sample of about 50,000 households. MPI's analyses included data from the monthly CPS on age, gender, race/ethnicity, U.S. citizenship status, place of birth of respondents and their parents, educational attainment, employment status, occupations and industries, hourly wages, and hours worked per week. The CPS March 2018 supplement, also known as the Annual Social and Economic Supplement, provided data on the share of workers whose employers or unions offered them a health insurance plan or a retirement plan. The CPS May 2017 Contingent Worker Supplement provided data on contingent and nonstandard work arrangements. The CPS uses three different measures of contingent work. The measure MPI researchers adopted defines contingent workers as those who do not expect their jobs to last more than a year into the future. This group includes wage and salary workers, no matter how long they have actually been in their jobs, and self-employed and independent contractors if they have been in their current jobs one year or less. The CPS also measures four types of alternate work arrangements: independent contractors, on-call workers, temporary help agency workers, and workers provided by contract firms to other employers.

The MPI researchers used the Census Bureau's 2017 American Community Survey (ACS) to capture English proficiency—a variable unavailable in the CPS.[61] This analysis uses the Census Bureau's definition of Limited English Proficient (LEP) to refer to respondents who reported speaking English "well," "not well," or "not at all," while fully proficient respondents are those who reported speaking English "very well" or as their only language.[62]

59 Frey and Osborne, "The Future of Employment."

60 Sarah Flood et al., *Integrated Public Use Microdata Series, Current Population Survey: Version 6.0 [dataset]* (Minneapolis, MN: IPUMS, 2018).

61 Steven Ruggles et al., *Integrated Public Use Microdata Series (IPUMS USA): Version 9.0 [dataset]* (Minneapolis, MN: IPUMS, 2019). To identify all other characteristics of workers, MPI researchers used CPS data. Even though the ACS has a much larger sample size, which would improve the precision of the report's estimates, it only identifies first-generation immigrants (those born outside the United States). The CPS identifies both the first and second generations (immigrants and those born in the United States to immigrant parents). The second generation is critical to this analysis because it represents an important component of future U.S. workforce growth.

62 For more information on these calculations, see the discussion of LEP workers in Section 2.

Data on Occupations and Skill Types

This report describes the distribution of immigrant-origin and other U.S. workers by 22 major occupational groups, and by selected detailed occupations. To do so, the researchers harmonized CPS and ACS occupation codes.

To classify occupations by skill level, the researchers used the U.S. Department of Labor's Occupational Information Network (O*NET) classification system, which analyses the educational and training requirements of occupations, among other criteria, and sorts them into five "Job Zones."[63] MPI then reclassified occupations into three skill levels:

- **Low-skilled jobs.** Occupations in this category usually require no more than a high school diploma and/or one year of training. They are classified as Job Zone 1 or 2.
- **Middle-skilled jobs.** These occupations usually require vocational schooling, an associate degree, or one to two years of on-the-job training or experience. These are classified as Job Zone 3.
- **High-skilled jobs.** High-skilled occupations usually require a bachelor's degree or higher, or at least several years of experience or training. These are classified as Job Zone 4 or 5.

Table A–1 provides more detail on how the U.S. Department of Labor sorts jobs into Job Zones. To identify Job Zones for major occupational groups, MPI used an average of the Job Zones of the detailed occupations within each group, weighted by the number of workers in each detailed occupation.

TABLE A–1

U.S. Department of Labor O*Net Job Zone (Skill Level) Classification Scheme

Zone Name	Experience	Education	Job Training
Job Zone 1: Little or No Preparation Needed	Little or no previous work-related skill, knowledge, or experience is needed for these occupations. For example, people can become waitstaff even if they have never worked before.	Some of these occupations may require a high school diploma or equivalent.	Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.
Job Zone 2: Some Preparation Needed	Some previous work-related skill, knowledge, or experience is usually needed. For example, a bank teller would benefit from experience working directly with the public.	These occupations usually require a high school diploma or equivalent.	Employees in these occupations need anywhere from a few months to one year of working with experienced employees to be fully trained. A recognized apprenticeship program may be associated with these occupations.

63 U.S. Department of Labor, Employment and Training Administration, "O*NET Online," accessed October 1, 2020.

TABLE A–1 (cont.)

U.S. Department of Labor O*Net Job Zone (Skill Level) Classification Scheme

Zone Name	Experience	Education	Job Training
Job Zone 3: Medium Preparation Needed	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, to perform the job.	Most of these occupations require training in vocational schools, related on-the-job experience, or an associate degree.	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers. A recognized apprenticeship program may be associated with these occupations.
Job Zone 4: Considerable Preparation Needed	A considerable amount of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.	Most but not all of these occupations require a four-year bachelor's degree.	Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training to be fully trained.
Job Zone 5: Extensive Preparation Needed	Extensive skill, knowledge, and experience are needed for these occupations. Many require more than five years of experience. For example, surgeons must complete four years of college and an additional five to seven years of specialized medical training to be able to do their job.	Most of these occupations require advanced degrees. For example, they may require a master's degree or even a PhD, MD (medical degree), or JD (law degree).	Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training before starting the position.

Source: U.S. Department of Labor, Employment and Training Administration, "Job Zone Reference," updated September 18, 2020.

Employment Projections and Indicators of Automation and Offshoring

To answer this study's central research questions about the potential impact of changing economic trends on the future of work for immigrant-origin workers in the United States, MPI researchers drew on the three sources of projections described below.

Bureau of Labor Statistics Employment Projections by Occupation

BLS regularly publishes projections about the future size of the labor force, by detailed occupation. This report relies on the published projections for 2018–28.[64] BLS projections take into account population projections and projected labor force participation rates to estimate the number of future workers. BLS develops projections about how much demand there will be for different kinds of goods and services, based on levels of consumer spending; spending by businesses; spending by federal, state, and local governments; exports and imports; and other factors. Based on these projections, BLS estimates the demand for employment in various industries and occupations within each industry. BLS also considers the

64 BLS, "Occupational Projections and Worker Characteristics."

potential influence of automation, offshoring, changes in business practices, and other trends on its future employment estimates.[65]

Limitations: BLS projections are a respected source of occupation-specific employment projections for the next decade at the U.S. level. However, BLS only makes nationwide predictions, which may have limited utility for local workforce development organizations and educational institutions. While BLS projections have a good track record of predicting broad labor market trends and employment in some key sectors, they are not always accurate for all detailed occupations and have in the past missed some major trends, such as the recession that began in the mid-2000s and the emergence of new technologies such as hydrofracking.[66] BLS' 2018–28 projections could not have anticipated the rapid, drastic economic downturn caused by the response to COVID-19 pandemic. How quickly the country recovers, and which jobs are created or destroyed in the process, will determine how well this set of projections performs.

MPI researchers considered using other sources of labor market information such as Burning Glass Technologies' projections, which capture real-time trends by compiling online job listings posted daily by employers.[67] But many jobs that employ immigrant-origin workers, particular lower-skilled and unauthorized immigrants, are not posted online, and thus the Burning Glass data would likely underestimate the demand for such workers.[68] As a result, the MPI researchers opted to proceed with using the BLS data.

Frey and Osbourne's Automation Risk Index

This analysis uses estimates of automation or "computerization" risk for 702 detailed occupations developed by Carl Benedikt Frey and Michael A. Osborne.[69] They analyzed whether these occupations involve tasks that computers or robots will be able to perform over the "next one to two decades." They divided tasks into (1) those that are routine, follow clear rules, and can easily be automated, and (2) those that are not routine but could be automated if they do not face "engineering bottlenecks." Potential bottlenecks include difficulties in programming computers to deal with perception and manipulation, creative tasks, and tasks that require social intelligence.

Frey and Osborne used the U.S. Department of Labor's O*NET to obtain data on the education, training, and tasks required for each detailed occupation. They first coded 70 occupations by hand, drawing on the subjective assessments of attendees at a workshop in their engineering department. They then built a computer model to learn from these hand-coded values and predict the risk of computerization for the remainder of the 702 occupations in their study.

65 BLS, "Employment Projections: Calculation," updated September 1, 2020.
66 Kathryn J. Byun, Richard Henderson, and Mitra Toossi, "Evaluation of BLS Employment, Labor Force and Macroeconomic Projections to 2006, 2008, and 2010," U.S. Bureau of Labor Statistics, Monthly Labor Review, November 2015; Derek Thompson, "The Government Is Horrible at Predictions (So Is Everybody Else)," *The Atlantic,* December 20, 2013.
67 Burning Glass, "Frequently Asked Questions," accessed May 16, 2020.
68 For example, compared to BLS data, Burning Glass data on job openings overrepresent computer, management, and business occupations, and underrepresent health-care support, transportation, maintenance, sales, and food service occupations. See Marcus Dillender and Eliza C. Forsythe, "Computerization of White Collar Jobs" (working paper, Upjohn Institute for Employment Research, Kalamazoo, MI, August 2019).
69 Frey and Osbourne, "The Future of Employment."

Their index reports which jobs could potentially be replaced with technology in the coming decades, given current technical capabilities. Frey and Osbourne do not attempt to predict which jobs will actually be automated over any particular period, since the extent of automation hinges on factors outside the nature of the tasks themselves, including the availability of cheap labor, government intervention, and the unpredictability of the pace of technological change.

Limitations: Other researchers have criticized Frey and Osbourne's projection that 47 percent of U.S. jobs are at risk of automation as an overestimate as well as their conclusion that low-skilled jobs are the most likely to be automated. A 2018 report by the Organization for Economic Cooperation and Development (OECD), for example, estimated that a much smaller 10 percent of jobs in the United States were at high risk of automation, using a method that considers variation in tasks among jobs within an occupational category.70 A 2019 analysis by the Brookings Institution challenged the assumption that only low-skilled jobs are slated to be overtaken by technology by considering which jobs are likely to be replaced by artificial intelligence, not just by robots and computers.[71]

MPI researchers relied on Frey and Osbourne's estimates despite these critiques for two reasons. First, while other researchers have questioned their estimate of the level of automation, their assessment of the relative risk of automation for various jobs remains widely cited, used, and built upon.[72] Second, their index of automatability by detailed occupation is publicly available, thereby allowing MPI to merge it with CPS data on the characteristics of workers by detailed occupation. As a result, MPI's analysis relies on Frey and Osbourne's assessment of the relative risk of future automatability, but not the absolute magnitude of it.

Binder's Offshoring Risk Index

To explore offshoring risk, MPI researchers relied on rankings developed by Alan Blinder, an economist at Princeton University.[73] Blinder used O*NET data on job tasks to examine three factors when ranking offshoring risk: (1) the degree to which occupations involve personal services with face-to-face contact versus impersonal services; (2) whether jobs must be performed at or near a specific U.S. work location; and (3) whether jobs can be provided over a great distance without a significant decline in their quality.

Blinder gave jobs that could be performed at any location a score of between 76 and 100. Jobs that must be performed at or close to a specific location, but that location does not have to be in the United States, were given a score between 51 and 75. Jobs that must be performed at a specific U.S. work location were all scored "below 25"; in this analysis, MPI recoded these jobs as 12.5 (the average between 0 and 25) to avoid under- or overestimating their offshoring risk. When harmonizing occupation codes that differed among the CPS, Frey and Osboure's projections, and Blinder's projections, the authors consolidated occupations and

70 Ljubica Nedelkoska and Glenda Quintini, "Automation, Skills Use and Training" (working paper no. 202, OECD Social, Employment, and Migration Working Papers, OECD Publishing, Paris, March 14, 2018).
71 Muro, Whiton, and Maxim, "What Jobs Are Affected by AI?"
72 Mark Muro, Robert Maxim, and Jacob Whiton, *Automation and Artificial Intelligence: How Machines Are Affecting People and Places* (Washington, DC: Brookings Institution, 2019); Arntz, Gregory, and Zierahn, "The Risk of Automation for Jobs in OECD Countries"; Ariane Hegewisch, Chandra Childers, and Heidi Hartmann, *Women, Automation, and the Future of Work* (Washington, DC: Institute for Women's Policy Research, 2019).
73 Blinder, "How Many U.S. Jobs Might Be Offshorable?"

averaged values across them. In some cases, this process involved averaging occupations scoring 12.5 with those scoring higher than 25 on offshoring risk, resulting in an average score between 12.5 and 25.

Blinder's index shows which jobs can potentially be moved abroad, but it does not predict how many will be. He also does not set a clear timeframe for offshoring. Blinder stated that his approach was designed to rank which jobs are most and least offshorable, without trying to estimate their actual likelihood of being offshored.

Limitations: Economist Adam Ozimek examined the jobs that Blinder estimated were at high risk of offshoring and their growth over the past ten years.[74] Ozimek found that jobs Blinder identified as at high risk of offshoring grew just as much as those identified as at lower risk of offshoring. However, the high-risk jobs were more likely to be performed remotely by U.S. workers from their homes; U.S. employers appear to be "offshoring" many such jobs from large, expensive U.S. cities to smaller ones where living costs are lower, rather than to other countries.[75]

In summary, both automation and offshoring indices are subjective and do not claim to predict how many jobs will be automated or sent abroad by a certain date. Therefore, MPI researchers interpret these indices as descriptive of the relative risks of automation and offshoring of one occupation compared to another, rather than as indicators of automation and offshoring risks in the overall economy or as predictions of the number of jobs likely to be affected over a particular timeline.

74 Ozimek, "Report: Overboard on Offshore Fears."
75 Ben Casselman, "The White-Collar Job Apocalypse that Didn't Happen," *The New York Times,* September 27, 2019.

Appendix B. Additional Data on Job Quality

TABLE A–2

Jobs of the Future: Job Quality Indices for Detailed Occupations, 2017/2018

	Share of Workers Eligible for Employer- or Union-Sponsored Health Insurance	Share of Workers with Retirement Plan Available through Employer or Union	Contingent Share of Workers
All Jobs of the Future	**72%**	**48%**	**4%**
Managers (Not Otherwise Classified)	68%	41%	2%
Elementary and Middle School Teachers	82%	68%	6%
Registered Nurses	88%	57%	2%
Nursing, Psychiatric, and Home Health Aides	60%	37%	2%
Postsecondary Teachers	81%	60%	16%
Physicians and Surgeons	83%	53%	7%
Management Analysts	65%	38%	4%
Other Teachers and Instructors	43%	35%	10%
Counselors	73%	52%	4%
Electricians	65%	42%	5%
Social Workers	88%	60%	3%
Hairdressers, Hairstylists, and Cosmetologists	23%	10%	3%
Licensed Practical and Licensed Vocational Nurses	73%	44%	0%
Pipelayers, Plumbers, Pipefitters, and Steamfitters	67%	41%	12%
Supervisors/Managers of Construction and Extraction Workers	69%	43%	5%
Medical and Health Services Managers	81%	51%	1%
Medical Assistants	77%	40%	1%
Recreation and Fitness Workers	43%	23%	4%
Physical Therapists	79%	44%	2%
Business Operations Specialists (Not Otherwise Classified)	88%	52%	4%
Nurse Practitioners	85%	57%	3%
Social and Human Service Assistants	73%	55%	5%

Note: Contingent workers are those who expect their jobs to last for no longer than an additional year.
Sources: MPI tabulation of data from the CPS 2017 Contingent Worker Supplement and 2018 March Supplement.

TABLE A–3

Declining Jobs: Job Quality Indices for Detailed Occupations, 2017/2018

	Share of Workers Eligible for Employer- or Union-Sponsored Health Insurance	Share of Workers with Retirement Plan Available through Employer or Union	Contingent Share of Workers
All Declining Jobs	**61%**	**38%**	**4%**
Cashiers	36%	24%	3%
Retail Salespersons	51%	32%	3%
Customer Service Representatives	69%	41%	4%
Secretaries and Administrative Assistants	72%	47%	4%
Maids and Housekeeping Cleaners	38%	18%	4%
Office Clerks (General)	63%	44%	6%
Miscellaneous Assemblers and Fabricators	73%	44%	5%
Bookkeeping, Accounting, and Auditing Clerks	57%	39%	2%
Inspectors, Testers, Sorters, Samplers, and Weighers (Nonagricultural Products)	79%	51%	1%
Computer Programmers	84%	45%	8%
Metalworkers and Plastic Workers (Not Otherwise Classified)	79%	49%	3%
Bailiffs, Correctional Officers, and Jailers	93%	71%	2%
Claims, Adjusters, Appraisers, Examiners, and Investigators	90%	61%	0%
Postal Service Mail Carriers	85%	71%	3%
Tellers	76%	49%	0%
Data Entry Keyers	70%	35%	6%
Purchasing Agents (Except Wholesale Retail and Farm Products)	78%	47%	0%
Sewing Machine Operators	49%	26%	4%
Printing Machine Operators	72%	43%	2%
File Clerks	58%	40%	19%
Hotel, Motel, and Resort Desk Clerks	53%	36%	2%
Bill and Account Collectors	72%	44%	4%

TABLE A–3 (cont.)

Declining Jobs: Job Quality Indices for Detailed Occupations, 2017/2018

	Share of Workers Eligible for Employer- or Union-Sponsored Health Insurance	Share of Workers with Retirement Plan Available through Employer or Union	Contingent Share of Workers
Electrical, Electronics, and Electromechanical Assemblers	81%	51%	2%
Postal Service Clerks	89%	72%	0%
Word Processors and Typists	75%	37%	9%
Telemarketers	60%	20%	0%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders (Metal and Plastic)	81%	44%	0%
Postal Service Mail Sorters, Processors, and Processing Machine Operators	88%	75%	0%
Molders and Molding Machine Setters, Operators, and Tenders (Metal and Plastic)	90%	43%	0%
Structural Metal Fabricators and Fitters	70%	38%	0%
Switchboard Operators, including Answering Services	75%	31%	0%
Purchasing Agents and Buyers (Farm Products)	79%	47%	0%

Note: Contingent workers are those who expect their jobs to last for no longer than an additional year.
Source: MPI tabulation of data from the CPS 2017 Contingent Worker Supplement and 2018 March Supplement.

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