Help Wanted: Employer Demand for Less-Skilled Temporary Foreign Worker Visas in an Era of Declining Unauthorized Immigration

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Employer demand for less-skilled foreign workers admitted on temporary worker visas has increased considerably in recent years. Issuances of H-2A visas for agricultural workers and J-1 visas for exchange visitors have soared, and the cap for H-2B visas for nonagricultural workers is reached well before the end of the issuance period. This article examines the rise in employer demand for these programs, focusing on the roles of improved economic conditions, tougher immigration enforcement, and the drop in the number of less-skilled workers, including unauthorized immigrants. Economic conditions appear to be the most important determinant of employer demand. The upward trend in employer usage of the programs suggests that they can be a viable alternative to hiring unauthorized workers, and even more so if restructured appropriately.

Keywords: temporary foreign workers, H-2A visa, H-2B visa, J-1 visa, less-skilled immigrants

A little-noticed recent trend in immigration is the rising demand by U.S. employers for less-skilled temporary foreign workers through the H-2A, H-2B, and J-1 visa programs. The H-2A and H-2B programs allow employers to bring foreign workers into the United States to fill temporary and seasonal jobs in the agricultural and nonagricultural sectors, respectively, if they cannot find available U.S. workers. The J-1 exchange visitor program allows certain foreign students, teachers, and other professionals to work in the United States for a short time. Many of the jobs these foreign workers fill require little if any education or training and pay relatively low wages. The programs' advocates, including employers who use them, argue that few American workers are willing to accept the jobs; meanwhile, critics voice concerns that the

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programs can result in exploitation of foreign workers as well as lower wages and fewer jobs for U.S. workers (see, for example, Huettman 2017; Honig 2018; Costa 2016, 2020). This article steps back from that contentious debate and examines why employer demand for the programs has increased in recent years and the implications of that increase.

The H-2 temporary foreign worker program was created as part of the 1952 Immigration and Nationality Act. The program was divided into the H-2A and H-2B programs as part of the 1986 Immigration Reform and Control Act (IRCA). IRCA also made it illegal to hire unauthorized immigrants, increased border enforcement, and gave some 2.7 million unauthorized immigrants legal status, enabling many of them to move into more-skilled, higher-paying jobs. At the time, many employers were concerned that the IRCA provisions might leave them unable to find enough less-skilled workers. Employers' concerns about labor shortages turned out to be largely unfounded for almost three decades. Employers and unauthorized immigrants quickly realized that enforcement of the hiring provisions was often lax, and the unauthorized population swelled during the 1990s and early 2000s, reaching almost twelve million in 2007. Consequently, employer demand for H-2A and H-2B visas was quite low for the first two decades after the programs began issuing visas in 1992.

These underlying factors began to change in the mid- to late 2000s. Immigration enforcement along the U.S.-Mexico border and in the U.S. interior became tougher in the wake of the 9/11 terrorist attacks. The housing bust and subsequent general economic downturn led to weaker demand for less-skilled workers in the United States. The recession coincided with a drop in the number of unauthorized immigrants as inflows ground to a near halt and more migrants returned home, especially to Mexico. Economic conditions eventually improved: U.S. unemployment rates fell and labor markets tightened as the recovery gained steam in the 2010s. Meanwhile, baby boomers began reaching retirement age and the number of less-educated U.S.-born workers dropped. Although these post-2010 trends traditionally would have led to growth in the unauthorized workforce, this time they did not. Immigration enforcement remained strict, with U.S. Border Patrol staffing and migrant removals near record highs. To help alleviate labor shortages, more employers began exploring other options, including turning to the H-2A and H-2B programs to legally hire less-skilled foreign workers.

Employers' use of the J-1 visa program also increased during the 2000s. The J-1 program was established under the Mutual Educational and Cultural Exchange Act (the Fulbright-Hays Act) of 1961 to promote global understanding by enabling foreign visitors to work, study, and travel in the United States. Although perhaps less well-known than the H visa programs, the J-1 program is the largest U.S. temporary foreign worker program as measured by annual visa issuances. The program has expanded over time to encompass fifteen categories. The largest of these is the Summer Work Travel (SWT) program, which allows students enrolled in a foreign university to work in a less-skilled seasonal or temporary job in the United States for up to four months. SWT typically accounts for about one-third of J-1 visas. Other less-skilled categories include au pairs and camp counselors; high-skilled categories include teachers and physicians.[1]

The confluence of trends—declining unauthorized immigration, tougher immigration enforcement, tighter labor markets, and fewer less-educated U.S.-born workers—makes it difficult to assess their relative contributions to the growth in employer demand for less-skilled temporary foreign workers via the H-2A, H-2B, and J-1 programs in recent years. Few studies have examined the determinants of employer demand for such foreign workers. The limited research available suggests that employer demand is related to economic conditions in predictable ways but has not examined the role of the unauthorized workforce or demographic shifts (Zavodny and Jacoby 2010; Charlton, Castillo, and Hertz 2018; Simnitt et

1. Not all categories allow visa holders to work, but the majority do. Daniel Costa (this issue, 2020) estimates that 80 percent of J-1 visas authorize employment.

al. 2018; GAO 2020).[2] This article uses a multivariate regression framework to investigate how these trends are related to employer demand for foreign workers on less-skilled temporary visas.

We find that economic conditions appear to be the most important determinant of employer demand for H-2A, H-2B, and J-1 workers. Employer use of the programs is not consistently related to the intensity of immigration enforcement; state-level results suggest more employers turn to the H-2B program but not the H-2A program when fewer substitutable workers are available. The rapid growth of the programs in recent years suggests that they can be a viable alternative to hiring unauthorized immigrants, particularly in seasonal industries and when labor markets are tight. However, the cap on the number of H-2B workers would need to be much higher and employer use of the programs much greater for them to fully replace the existing stock of unauthorized immigrant workers. This would also require that the programs include year-round employment in a wider array of industries. Other changes that would make the programs more attractive to employers include making the programs more flexible, easier to use, and more responsive to changes in labor market conditions. Protecting foreign and U.S. workers' rights is important as well.

OVERVIEW OF THE H-2A, H-2B, AND J-1 VISA PROGRAMS

Before looking into the determinants of employer demand for less-skilled temporary foreign workers via the H-2A, H-2B, and J-1 programs, it is helpful to understand the design of the programs and the trends in their usage.

H-2A and H-2B Program Structure and Rules

Bringing in foreign workers under the H-2A or the H-2B program involves several steps and applications to multiple government agencies. A prospective employer first files a labor certification application (LCA) with the Department of Labor (DOL) (for a detailed explanation of program structure and rules, see Bruno 2017).[3] The DOL must certify that not enough U.S. workers are able, willing, qualified, and available to do the work and that hiring foreign workers will not adversely affect the wages and working conditions of similarly employed U.S. workers. As part of this process, employers must try to recruit U.S. workers. Prospective H-2B employers also must establish that their need for foreign workers is temporary, either as the result of a one-time occurrence or a seasonal, peakload, or intermittent need. Similarly, prospective H-2A employers must have only a temporary or seasonal need for foreign workers, not a year-round need.[4]

After receiving labor certification, employers next submit an application, called an I-129 petition, to the Department of Homeland Security (DHS) to bring in foreign workers. If the application is approved (and, for numerically limited visas, the cap has not been reached), employers can hire up to the approved number of foreign workers. Employers typically work with a recruiter in a foreign country to find workers. Workers who are abroad go to a U.S. embassy or consulate to apply for an H-2A or H-2B nonimmigrant visa from the Department of State. If their visa application is approved, workers are issued a visa and can migrate to the United States to work for the approved employer. The visas are usually valid for up to ten months. An employer can apply to extend a temporary foreign worker's stay in increments of up to one

2. Madeline Zavodny and Tamar Jacoby (2010) examine how the number of employer requests for H-2B workers is related to the employment growth rate and the unemployment rate at the state level between 2006 to 2009. Diane Charlton, Marcelo Castillo, and Tom Hertz (2018) examine employer demand for H-2A workers at the state level during 2007 to 2017. Skyler Simnitt and coauthors (2018) focus on possible "contagion effects" across counties in H-2A program use. A 2020 GAO report concludes that counties with employers that applied to hire H-2B workers had lower unemployment rates and higher wages than counties in which employers did not apply to use the program (GAO 2020).

3. As Andorra Bruno (2017) explains, H-2B employers must first register with the DOL and establish that their need for foreign workers is temporary before they can apply for labor certification.

4. This rule has limited exceptions, such as sheep herding (Bruno 2017).

year, but a worker cannot stay in the United States on an H-2A or H-2B visa for more than three consecutive years (Bruno 2017).

The H-2A and H-2B programs impose several rules regarding compensation. Employers cannot pay temporary foreign workers or U.S. workers in similar jobs below the program's wage floor, which is set based on the job and location.[5] Employers must cover round-trip transportation between foreign workers' home country and the worksite, and H-2A employers must provide free housing and daily transportation to and from the worksite for nonlocal workers. Employers must pay for H-2 workers to be included in their state workers' compensation program, but H-2 workers are exempt from Social Security and Medicare taxes. Employers must guarantee temporary foreign workers employment for at least three-quarters of the contract period.[6] It is illegal for employers or recruiters to charge temporary foreign workers fees for job placement, although critics note that many workers pay large fees to foreign recruiters (for example, Costa 2016).

The programs have several additional rules aimed at ensuring that they do not harm U.S. workers. For example, employers must try to hire U.S. workers during the recruiting phase, and during the first half of the season, an H-2A employer must continue to recruit and hire any U.S. job applicants who are ready, willing, and able to do the job even if the employer has already brought in temporary foreign workers on H-2A visas.

The number of H-2A visas is unlimited, whereas the number of H-2B visas is capped at sixty-six thousand per fiscal year (FY).[7] In some years, Congress has opted to make additional H-2B visas available, either by exempting "returning" workers who counted toward the cap in a prior year or by giving DHS discretion to raise the cap. The former occurred in FY 2005 through 2007 and again in FY 2016, and the latter in FY 2017 through 2019.[8] The years when the cap has been raised are periods of relatively strong economic growth and low unemployment. Heightened employer demand for temporary foreign workers during those periods likely underlies the temporary expansions of the H-2B program. DHS stops accepting H-2B petitions if it believes it has received enough petitions to fill the cap.[9]

5. H-2A employers must pay workers the highest of the applicable minimum wages, the applicable prevailing wage rate, the adverse effect wage rate, and any collective bargaining wage rate. H-2B employers must pay workers the highest of the applicable minimum wages and the prevailing wage rate (Bruno 2017).

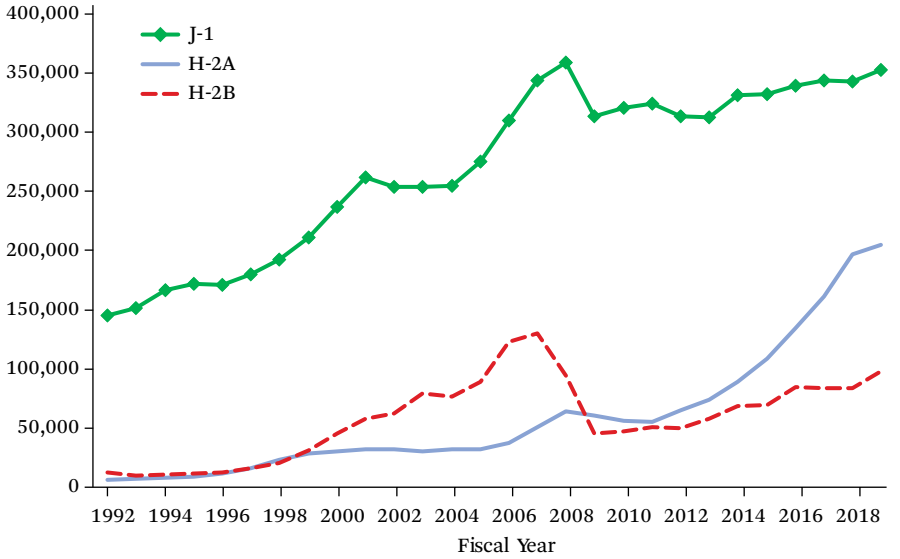
6. This work guarantee was extended from the H-2A program to the H-2B program by regulations issued in 2012 (GAO 2015).

7. Limited exceptions to the cap include fish roe workers and workers in the Commonwealth of the Northern Mariana Islands and Guam. Since FY 2006, the cap has been split into thirty-three thousand visas available to workers who begin in the first half of the fiscal year and another thirty-three thousand for workers who begin in the second half. Any unused visas from the first half are made available in the second half, but they do not carry over across fiscal years.

8. Specifically, Congress exempted returning H-2B workers who had been counted against the cap in any one of the three prior fiscal years from the cap for FY 2005 through FY 2007 and again for FY 2016. For FY 2005 through 2007, those additional visas were called H-2R visas. For FY 2005 only, Congress also provided for an additional thirty-five thousand H-2B visas beyond the cap of sixty-six thousand. For FY 2017 through 2020, Congress authorized DHS to make additional H-2B visas available if the department determined after consulting with the DOL that not enough qualified U.S. workers were available to meet businesses' needs. The number of additional visas could not exceed the maximum number of H-2R visas issued, which was almost sixty-five thousand in FY 2007. DHS decided to issue an additional fifteen thousand visas in FY 2017 and 2018 under this provision and to limit them to businesses that attested they would suffer irreparable harm if they could not hire workers under the H-2B program. In FY 2019, DHS decided to issue up to an additional thirty thousand visas, available only to workers who had previously had an H-2B visa.

9. If DHS determines that it received more petitions than the number of H-2B visas available while it was still accepting petitions, it holds a lottery. This occurred for both halves of FY 2018 and 2019.

Figure 1. H-2A, H-2B, and J-1 Visas Issued



Source: U.S. Department of State 2020.
Note: H-2B visas includes H-2R visas between FY 2005 and 2007.

J-1 Program Structure and Rules

The design of the J-1 program differs from the H-2 programs in several key ways. J-1 visa holders must have a sponsor. Sponsors are U.S. government agencies, academic institutions, or private-sector entities approved by the State Department. Sponsors screen and select participants and issue participants a Form DS-2019 that allows them to apply to the State Department for a J-1 visa. Sponsors match participants with an employer and monitor them while they are in the United States. Sponsors are allowed to charge participants a fee. The J-1 program does not require that employers go through labor certification with the DOL or receive approval from DHS. J-1 visas are valid for a period ranging from several months (for the less-skilled categories) to several years (for the higher-skilled categories).

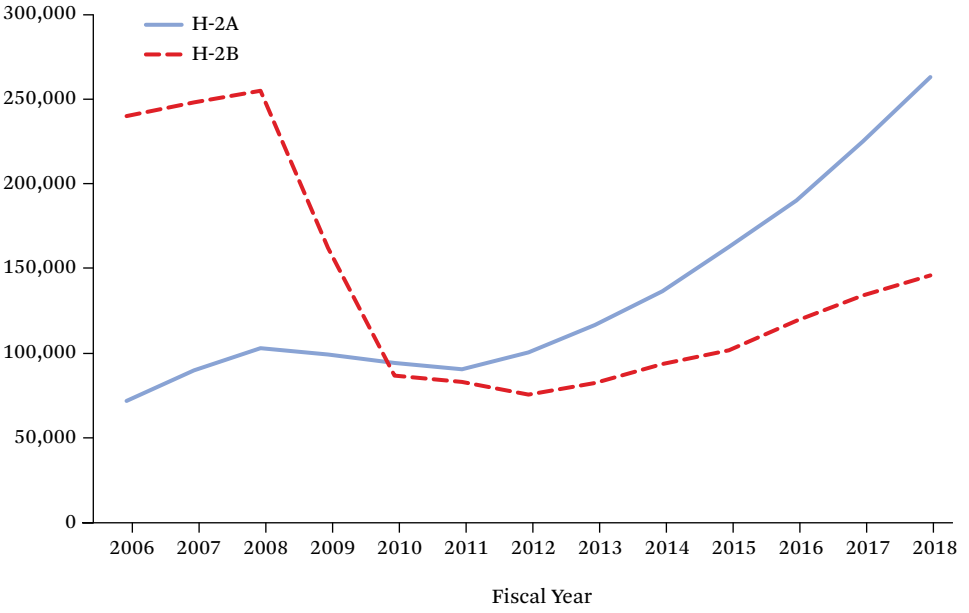
The total number of J-1 visas is uncapped, but the State Department imposed an annual cap on the SWT category of 109,000 visas in 2011. The cap was in response to concerns that inadequate oversight by the State Department allowed employers to exploit SWT program participants. The State Department also introduced several provisions aimed at protecting U.S. and J-1 workers, including that employers may not displace U.S. workers with J-1 workers, that they must pay prevailing local wages, and that they may not hire J-1 workers if they have recently laid off U.S. workers (National Immigration Forum 2018).

Trends in Program Use

Figure 1 shows the number of H-2A, H-2B, and J-1 visas issued from FY 1992 to 2019.[10] The J-1 program is by far the largest of the three programs. In the early years after the H-2 program was split into separate H-2A and H-2B programs, only a small number of H-2A and H-2B visas were issued. From FY 1999 to 2006, growth in the H-2B and J-1 programs outpaced the H-2A program. The impact of the recession is evident in the late 2000s, particularly in the H-2B data series (however, because the end of the returning worker exemption after FY 2007 coincided with the recession, the drop probably should not be fully attributed to economic conditions). Since FY 2009, issuances of H-2A

10. The number of H-2B visas issued exceeded the program cap of sixty-six thousand in several of the years shown in figure 1. Some of these—FY 2007 to 2009 and FY 2016 to 2019—are years when additional visas

Figure 2. H-2A and H-2B Workers Certified



Source: Authors' calculations from labor certification applications data available at http://www.flcdatacenter.com/ (accessed June 1, 2020).

visas have exceeded those of H-2B visas. Issuances of H-2A and H-2B visas have risen at a brisk clip since the early 2010s. Growth in the J-1 program has been more muted since then, perhaps because of the cap imposed on the SWT category in 2011.[11] Nonetheless, the figure indicates rising employer demand for all three programs.

The caps on H-2B visas and the SWT program make it difficult to use visa issuances to measure employer demand for the programs. Another way to measure employer demand, at least for the H-2A and H-2B programs, is the number of workers that employers request and then are certified to hire via LCAs. Figure 2 shows the number of workers certified by the DOL for FY 2006 through 2018 for worksites in the fifty states and, for H-2B visas, in Washington, D.C.[12] The trends in the number of workers certified for the H-2A and H-2B programs are

were made available by Congress or DHS. But the number of visas issued exceeded the cap in some other years as well. This does not necessarily mean that the final number of H-2B workers in the United States exceeded the cap since not all visas issued are ultimately used to enter the United States and work. DHS takes this incomplete take-up, as well as the fact that not all approved petitions result in a visa being issued, into account when approving petitions and approves more petitions than the cap (for a discussion of the complexities of administering the H-2B cap, see U.S. Citizenship and Immigration Services 2016). In some years, the H-2B cap was exceeded because usage ended up being higher than DHS anticipated when it approved petitions. In other years, the department realized visa issuances were lower than it had anticipated when it stopped accepting petitions and reopened its application process. This happened in FY 2009 and FY 2015 (see table 1 note).

11. We would prefer to focus on less-skilled J-1 categories (au pairs, camp counselors, students, interns, and SWT), but State Department (2019) data for individual categories are available only beginning in FY 2016.

12. The number of workers requested is a better gauge of demand than the number certified, but the former is not available for both programs in FY 2008 through 2010 or FY 2013 through 2014 as well as for the H-2B program in FY 2006. For years when the number of workers requested and the number certified are both avail-

Table 1. DHS Cutoff Date for Accepting H-2B Petitions

FY	First Half of FY	Second Half of FY
2006	December 15, 2005	April 4, 2006
2007	November 28, 2006	March 16, 2007
2008	September 27, 2007	January 2, 2008
2009	July 29, 2008	January 7, 2009
2010	—	—
2011	—	—
2012	—	—
2013	—	—
2014	March 14, 2014	—
2015	January 26, 2015	March 26, 2015
2016	March 15, 2016	May 12, 2016
2017	January 10, 2017	March 13, 2017
2018	December 15, 2017	February 27, 2018
2019	December 6, 2018	February 19, 2019
2020	November 15, 2019	February 18, 2020

Source: U.S. Citizenship and Immigration Services 2016.
Note: If no date is indicated, the cap was not reached. Applications were reopened for the second half of FY 2009 from August 6, 2009, through the end of the fiscal year, and for second half of FY 2015 from June 5, 2015, through June 11, 2015.

similar to those in visa issuances during the same period. Employer demand for the H-2A program has soared since FY 2011; employer demand for the H-2B program fell dramatically during the recession but has risen steadily since FY 2012.

The H-2B cap makes labor certification applications also an imperfect measure of employer demand because employers stop submitting applications once the cap has been reached. We therefore examine one more measure of employer demand for the program: how long it takes to reach the cap. DHS stops accepting H-2B petitions when it believes the cap has been reached and announces that date on its website. Table 1 reports the last date H-2B applications were accepted for each period since FY 2006.[13] Given that the fiscal year starts in October, the earlier the first (second) half cap is reached before the end of March (September), the longer employers have to wait until a new batch of H-2B visas is available. As the table indicates, the cap was not binding in the first few years after the recession but has been reached in both halves of the fiscal year since FY 2015. Further, the cutoff date has been moving forward over the last four years, indicating rising employer demand for the H-2B program. Indeed, for the second half of FY 2018, DHS stopped accepting applications just five business days into the application period and held a lottery among those applications. In essence, all of the H-2B visas available during the next six months were claimed in just the first week.

Other measures of employer demand for the programs include the number of foreign workers with H-2A, H-2B, and J-1 visas working in the United States during a fiscal year and the number of jobs those workers fill.[14] Unfortunately,

able, the correlation between the state-level count of workers requested and workers certified is 0.998 for the H-2A program and 0.982 for the H-2B program.

13. The cap was first split in half across the fiscal year in FY 2006.

14. The number of H-2A and H-2B visa holders does not perfectly correspond to the number of jobs filled by those workers because some workers fill more than one job. This is particularly common for agricultural workers

these numbers are not available; they are also not necessarily the same as the number of visas issued or, for H-2A and H-2B visas, the number of workers certified.[15] However, the trends in visa issuances and workers certified shown in figures 1 and 2 should reflect the trend in the actual number of temporary foreign workers and are the best available measures of the number of H-2A, H-2B, and J-1 workers.

Although the programs have grown considerably over time, they account for a fairly small share of workers. Philip Martin (2017) estimates that 7 percent of full-time-equivalent crop workers are on H-2A visas; and Skyler Simnitt and coauthors (2018) estimate that 22 percent of farm work positions are filled by H-2A workers. Because the H-2B and J-1 programs encompass a large number of sectors, it is not clear how best to measure their shares of workers. Given that the U.S. labor force included more than ten million adults (age twenty-five and older) who did not have a high school diploma and more than twenty million young adults ages sixteen to twenty-four in 2018, either program is a truly tiny share of the less-skilled labor market (see BLS 2019a, 2019b). In some sectors and locations, however, the H-2B program accounts for a substantial share of workers. Reports note, for example, that ski resorts and seafood processors in some regions depend heavily on H-2B workers (see, for example, Zavodny and Jacoby 2010; Benedict, Mishra, and Gillespie 2013).

Profile of Typical Jobs and Workers

Workers with H-2A and H-2B visas typically fill jobs that require little formal education or specific skills. More than 99 percent of H-2A LCAs in FY 2018 indicated that the job required no education, and one-quarter of 1 percent that the job required a high school diploma or GED (U.S. Department of Labor, Office of Foreign Labor Certification 2020). The figures for H-2B LCAs are similar: more than 94 percent that fiscal year indicated that the job required no education, and slightly less than 5 percent that the job required a high school diploma or GED. The top jobs for workers with H-2A visas are farmworkers and laborers. The top jobs for workers with H-2B visas in recent years include landscaping and groundskeeping, forestry workers, housekeeping, and amusement and recreation attendants. Less information is available about the jobs that J-1 visa holders fill, in part because their employers do not have to file an LCA. An analysis of J-1 SWT data for 2015 obtained via a Freedom of Information Act request indicates that more than half of workers were in the leisure and hospitality sector (ILRWG 2019).

Consistent with few skill requirements, jobs filled by workers with H-2A and H-2B visas usually pay relatively low wages. The average hourly wage listed on H-2A labor certification applications was slightly below $12 in FY 2018, and the average hourly wage on H-2B applications was $13.60.[16] Information about J-1 wages is not available.

Workers with H-2A and H-2B visas are overwhelmingly male and relatively young. From FY 2009 through 2013, fully 96 percent of workers on H-2A visas were male, as were between 85 percent and 88 percent of workers on H-2B visas (GAO 2015). Three-fourths of workers were age forty or younger (GAO 2015). Most J-1 visa hold-

in areas where cooperatives coordinate the movement of H-2A workers across farms, as in North Carolina. Each individual employer files an LCA and appears in the DOL data we use, but a worker does not receive a separate visa for each job.

15. The number of visas issued likely overcounts the number of actual foreign workers since not all visas issued were ultimately used. However, some visas are valid for longer than twelve months or are extended beyond twelve months. The number of visas issued in a given fiscal year could therefore, in theory, undercount the number of foreign workers and the number of jobs they filled during that fiscal year. The number of H-2A and H-2B workers certified by the DOL overcounts the actual number of foreign workers and the number of jobs they fill because, among other reasons, DHS does not approve all petitions, some employers decide not to proceed after receiving certification, and the H-2B cap may have been reached.

16. Total compensation significantly exceeds the wage once the value of housing, transportation, and other benefits are included, particularly in the case of H-2A workers.

ers are young because many of the categories are limited to students. According to the State Department (2019), 86 percent are age thirty or younger, and slightly more than half are female.

Participation in the H-2A and H-2B programs is limited to nationals of countries designated annually by DHS. Countries are excluded from participating in one or both programs if the U.S. government is concerned about program fraud, abuse, denial rates, overstay rates, or human trafficking, among other concerns. Most workers with H-2A and H-2B visas are from Mexico—92 percent of H-2A visas and 74 percent of H-2B visas issued in FY 2018 were to Mexicans. J-1 visa recipients are considerably more geographically diverse. Britain, Germany, Brazil, France, and Spain were the top countries of recipients in FY 2018, and each accounted for less than 10 percent of J-1 visas (U.S. Department of State 2020).

Little information is available about the employers of H-2A, H-2B, and J-1 workers. The DOL data we use gives H-2A and H-2B employers' names and addresses and a few details about the job for which the employers requested temporary workers (such as the wage and occupation). The data do not indicate total employment by a given employer, why the employer wanted to hire foreign workers (besides information on the nature of the temporary need, such as seasonal, intermittent, peak load, or one-time occurrence), or how the employer attempted to hire other workers.

EMPLOYER DEMAND

We examine employer demand for H-2A, H-2B, and J-1 workers at the national and state level using available data on visa issuances and, for H-2 visas, labor certification applications along with data on economic conditions, the number of potentially substitutable workers, and measures of immigration enforcement. We first explain the regression models and the data used to estimate those models and then turn to the results.

Data and Empirical Model

The two salient measures of employer demand at the national level are the number of H-2A, H-2B, and J-1 visas issued and the number of H-2A and H-2B workers certified by the DOL. At the state level, we are able to examine only the number of H-2A and H-2B workers certified by the DOL because the visa issuance data do not include foreign workers' destination state.[17] As discussed, both measures are imperfect proxies for underlying employer demand to hire temporary foreign workers through the programs.

We expect employer demand to depend on economic conditions, the availability of substitutable workers, and how strictly immigration laws are enforced. Our basic regression model at the national level is

$$\text{H-2A, H-2B, or J-1 workers}_t = \alpha + \beta\text{Economic conditions}_{t-1} + \gamma\text{Substitutable workers}_{t-1} + \delta\text{Enforcement}_{t-1} + \text{Trend}_t + \varepsilon_t, \quad (1)$$

and our basic regression model at the state level is

$$\text{H-2A or H-2B workers}_{st} = \alpha + \delta\text{Economic conditions}_{st-1} + \gamma\text{Substitutable workers}_{st-1} + \delta\text{Enforcement}_{st-1} + \text{State}_s + \text{Time}_t + \text{Trend}_{st} + \varepsilon_{st}, \quad (2)$$

where t indexes years in both equations and s indexes states in the second equation. For ease in interpreting the regression results, we measure the dependent variable as the natural log of the number of visas issued or workers certified.

We use two measures of economic conditions: the unemployment rate and real gross domestic product (GDP). We expect employer demand to be negatively related to the unemployment rate because a higher unemployment rate means greater availability of other workers and therefore less need for employers to turn to the visa programs. A higher unemployment rate also typically means less product and services demand and hence less labor demand.[18] We ex-

17. Only three years of J-1 state-level data are available from the State Department, making the panel too short to analyze.

18. This may be particularly true when looking at demand for H-2B workers at the state level because those workers tend to be in nontradables sectors, such as landscaping and entertainment and recreation. To the extent

pect employer demand to be positively related to real GDP because employers typically demand more workers when output and income are higher; this demand may extend to temporary foreign workers. Higher real GDP also may mean that fewer other workers are available. The regressions use the natural log of real GDP for ease of interpretation. These variables (and the other right-hand-side variables) are measured on a calendar-year basis and are lagged to reduce potential endogeneity.[19]

We focus on two measures of substitutable workers: the number of less-educated U.S. natives in the labor force and the number of less-educated immigrants from Mexico and Central America in the labor force who are not naturalized U.S. citizens. We expect the number of temporary foreign workers requested to be negatively related to both measures given that greater availability of other workers likely means that fewer employers turn to the visa programs. Less-educated U.S. natives are defined here as those who have not completed high school; less-educated immigrants are defined as those who have at most completed high school. Both measures include workers ages sixteen and older; although many younger U.S. natives will eventually complete high school, they may be quite substitutable for temporary foreign workers while still in high school.

The number of less-educated nonnaturalized workers from Mexico and Central America is a proxy for the number of unauthorized workers because the majority of unauthorized workers have at most a high school education and are from that region. Several other studies use a similar measure to proxy for unauthorized immigrants (Amuedo-Dorantes and Bansak 2014; Bohn, Lofstrom, and Raphael 2014; Orrenius and Zavodny 2017). We use the estimated number of unauthorized immigrants in some specifications as a robustness check (for data sources and further details, see the appendix). We use the natural log of these demographic variables in the regressions.

Our primary measure of immigration enforcement is the presence of laws requiring all or almost all employers to use E-Verify. E-Verify is a database run by DHS that enables employers to check the employment eligibility of workers they hire. We focus on universal E-Verify requirements because previous research indicates that their enactment reduces the number of likely unauthorized immigrants in a state (Bohn, Lofstrom, and Raphael 2014; Orrenius and Zavodny 2017) and because, unlike some other immigration enforcement initiatives, their direct target is employers rather than unauthorized immigrants. If a state requires employers to use E-Verify, some employers may shift from hiring unauthorized immigrants to using the visa programs to hire legal foreign workers. We therefore expect to find a positive relationship between the E-Verify variable and our measures of employer demand for temporary foreign workers.

During the period we examine, eight states—Alabama, Arizona, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Utah—began requiring all or almost all employers to use E-Verify; we refer to those laws as universal E-Verify laws here.[20] Currently no federal requirement is in place that employers use E-Verify except for federal agencies and certain federal government contractors. In the national-level regressions, we measure E-Verify requirements as the share of states that had a universal E-Verify law in effect. In the state-level regressions, we include a variable indicating whether that state had a universal E-Verify law in effect. In some specifications of our national-level regressions, we also examine whether

that H-2A workers work on crops that are sold nationally or internationally, state-level economic conditions may not have much effect on product demand.

19. The lag is effectively three-quarters of a year given that the fiscal year begins in October.

20. North Carolina's law exempts agricultural employers from using the system for short-term workers; the other laws apply to agricultural and non-agricultural employers alike. Several other states require some or all government agencies and/or government contractors to use E-Verify. We do not examine those laws here because few temporary foreign workers are employed by government agencies or government contractors. We do not classify states that allow an alternative to E-Verify as universal E-Verify states.

Table 2. Descriptive Statistics

	Nation		States
	1995–2018	2006–2018	2006–2018
Number of H-2A visas issued	59,439	88,698	—
	(47,960)	(48,149)	
Number of H-2B visas issued	61,977	75,913	—
	(31,639)	(27,537)	
Number of J-1 visas issued	281,240	329,828	—
	(60,951)	(15,497)	
Number of H-2A requests certified	—	134,025	2,681
		(58,996)	(4,862)
Number of H-2B requests certified	—	140,478	2,754
		(66,492)	(4,078)
Unemployment rate	5.9	6.5	6.0
	(1.6)	(1.9)	(2.1)
Real GDP (billions)	14,466	16,217	316
	(2,264)	(1,004)	(391)
Number of less-educated U.S.-born workers	11,605	9,825	281
(thousands)	(2,277)	(1,354)	(265)
Number of less-educated, non-naturalized Latin	6,726	7,861	118
American workers (thousands)	(1,465)	(206)	(306)
Universal E-Verify requirement	0.04	0.08	0.08
	(0.06)	(0.06)	(0.26)
Number of observations	24	13	663

Source: Authors' calculations.

Note: Standard deviations in parentheses. The first two columns show national averages, and the third column shows averages across the fifty states and Washington, D.C. The H-2A, H-2B, and J-1 data are for fiscal years, and Washington, D.C., is not included in the H-2A data (and only 650 state-level observations are available). All other variables are for calendar years and are lagged one year from the period indicated. At the national level, universal E-Verify requirement is the fraction of states with a universal E-Verify requirement in place, weighted by the fraction of the year the requirement was in effect.

other measures of immigration enforcement, such as Border Patrol staffing along the U.S.-Mexico border and apprehensions of unauthorized immigrants by the Border Patrol, affect employer demand; because those measures show no state-level variation, we cannot include them in state-level regressions.

The national-level regressions include a linear time trend; the state-level include state and year fixed effects and state-specific linear time trends. The time trend variables control for smooth trends in program use. The state fixed effects control for unobservable, time-invariant state-level factors that influence program use, and the year fixed effects control for unobservable time-varying factors that are shared across states. This includes changes in the national business cycle as well as changes in program rules, such as a temporary increase in the H-2B cap; we cannot control for such factors in the national-level regressions with year fixed effects because only one observation is available per year. The national-level regressions are estimated using the Cochrane-Orcutt transformation to control for AR(1) serial correlation. In the state-level regressions, the standard errors are clustered on the state to control for state-specific correlation over time.

Table 2 presents means and standard deviations for our primary variables of interest. At the national level, we examine the periods from 1995 to 2018 and from 2006 to 2018. At the state

level, we examine the period from 2006 to 2018.[21] The periods we are able to examine are limited by data availability. This results in a very short time series, and we caution that our results, particularly the national-level ones, should be interpreted with this in mind.[22]

Results

At the national level, the demand for less-skilled temporary foreign workers appears to be most strongly tied to economic conditions. As the first column in table 3 shows, the number of H-2A visas issued is negatively related to the unemployment rate during the period between 1995 and 2018. A 1 percentage point increase in the unemployment rate is associated with a 9 percent drop in the number of H-2A visas issued. The third column shows that the number of H-2B visas issued is positively related to real GDP during the same period. The point estimate indicates that a 1 percent increase in real GDP is associated with a 12.6 percent increase in the number of H-2B visas issued, a sizable effect. The number of J-1 visas also is positively related to real GDP (column 5), though the relationship is smaller in magnitude than for H-2B visas. Visa issuances are not statistically significantly related to our measures of the number of other workers available—less-educated U.S. natives and Latin American non-naturalized immigrants—during that period, nor to the share of states with a universal E-Verify requirement. We do not find a statistically significant relationship between the number of visas issued during 2006 to 2018 and any of our variables of interest (columns 2, 4, and 6), though the trend in H-2A visa issuances is strong and positive.

At the national level, the number of H-2A workers certified is negatively related to the unemployment rate during the short period for which data on the number of workers certified is available (2006 to 2018). As column 1 of table 4 shows, a 1 percentage point increase in the unemployment rate is associated with a drop in H-2A certifications of about 11 percent. Surprisingly, the relationship between the number of H-2A workers certified and the number of less-educated, non-naturalized Latin American workers is positive. This could indicate that more low-skilled immigrants enter or stay in the United States when demand for agricultural workers is higher, and therefore employer use of the H-2A program is higher during those years as well. In other words, some unobserved common factor may affect both the demand for H-2A workers in a given year and the number of low-skilled Latin Americans working in the United States the year before. The positive relationship also could reflect the direct influence of the programs on the number of less-educated, non-naturalized Latin American workers, although the programs are small relative to the size of that population.

The number of H-2A and H-2B workers certified is related to underlying economic conditions at the state level as well. As table 5 shows, a 1 percentage point increase in a state's unemployment rate is associated with an 8 percent drop in the number of H-2A workers certified and a 16 percent drop in the number of H-2B workers. The number of H-2A workers certified is positively related to the number of less-educated U.S.-born workers, a surprising result. For H-2B workers, in contrast, the estimated relationship is negative, which is the expected sign. The results therefore indicate that demand for H-2B workers falls within states when greater numbers of substitutable U.S. workers are available, but demand for H-2A workers does not. This may be due to differences in program structure or in the nature of the jobs involved. American workers may be more willing to take nonagricultural jobs than agricultural jobs, making them more substitutable for H-2B workers. The number of H-2A or H-2B workers certified is not related to the

21. Our two main measures of substitute workers first become available in 1994, which limits the initial year we examine to 1995 because we use a one-year lag of those variables. Data on the number of workers certified for the H-2A program are first available for FY 2006.

22. The national time-series regressions for the shorter period (2006–2018) are also a useful benchmark for state-level result comparisons.

Table 3. Demand for Less-Skilled Temporary Foreign Workers: National-Level Regression Results for Visas Issued

	H-2A		H-2B		J-1	
	(1) 1995–2018	(2) 2006–2018	(3) 1995–2018	(4) 2006–2018	(5) 1995–2018	(6) 2006–2018
Unemployment rate	−0.089**	−0.098	0.050	0.017	0.012	−0.004
	(0.035)	(0.050)	(0.070)	(0.291)	(0.014)	(0.040)
Real GDP	−1.816	−2.945	12.550**	14.400	2.821**	1.651
	(2.505)	(4.675)	(5.145)	(26.992)	(1.013)	(3.733)
Number of less-educated U.S.-born workers	1.141	0.671	4.107	1.512	−0.120	−0.244
	(1.373)	(0.999)	(2.929)	(5.802)	(0.591)	(0.789)
Number of less-educated, nonnaturalized Latin American workers	−0.285	1.938	−0.106	−6.031	−0.106	0.564
	(0.747)	(1.166)	(1.601)	(7.068)	(0.323)	(0.794)
Share of states with universal E-Verify requirement	−0.918	−0.772	3.267	0.299	−0.793	−0.152
	(1.964)	(1.547)	(4.151)	(8.877)	(0.831)	(1.258)
Trend	0.195**	0.187**	−0.126	−0.167	−0.027	−0.029
	(0.068)	(0.071)	(0.143)	(0.409)	(0.029)	(0.056)
Constant	18.094	13.602	−145.498***	−85.294	−12.118	−4.525
	(22.011)	(51.254)	(43.173)	(293.506)	(8.230)	(41.782)

Source: Authors' calculations.

Note: Standard errors in parentheses. Shown are estimated coefficients from AR(1) regressions of the number of H-2A, H-2B, or J-1 visas issued for the period indicated (in fiscal years) on the variables indicated. The H-2A, H-2B, and J-1 variables, real GDP, and number of less-educated U.S.-born workers and less-educated, nonnaturalized Latin American workers are measured as natural logs.

*$p < .1$; **$p < .05$; ***$p < .01$

Table 4. Demand for Less-Skilled Temporary Foreign Workers: National-Level Regression Results for Workers Certified, 2006–2018

	H-2A (1)	H-2B (2)
Unemployment rate	−0.111**	−0.103
	(0.034)	(0.082)
Real GDP	−5.419	7.096
	(3.127)	(7.612)
Number of less-educated U.S.-born workers	1.020	1.949
	(0.669)	(1.609)
Number of less-educated, nonnaturalized Latin American workers	1.838*	1.087
	(0.786)	(1.660)
Share of states with universal E-Verify requirement	0.106	0.095
	(1.034)	(2.559)
Trend	0.200***	−0.102
	(0.047)	(0.115)
Constant	35.519	−82.175
	(34.235)	(84.980)

Source: Authors' calculations.
Note: Standard errors in parentheses. Shown are estimated coefficients from AR(1) regressions of the number of H-2A or H-2B visa requests certified on the variables indicated. The H-2A and H-2B variables, real GDP, and number of less-educated U.S.-born workers and less-educated, nonnaturalized Latin American workers are measured as natural logs.
*$p < .1$; **$p < .05$; ***$p < .01$

Table 5. Demand for Less-Skilled Temporary Foreign Workers: State-Level Regression Results for Workers Certified, 2006–2018

	H-2A (1)	H-2B (2)
Unemployment rate	−0.084***	−0.163***
	(0.014)	(0.032)
Real GDP	1.023	1.457
	(0.729)	(1.350)
Number of less-educated U.S.-born workers	0.384***	−0.505***
	(0.129)	(0.185)
Number of less-educated, nonnaturalized Latin American workers	−0.013	−0.042
	(0.016)	(0.033)
Universal E-Verify requirement	−0.123	−0.933
	(0.101)	(0.624)

Source: Authors' calculations.
Note: Standard errors in parentheses, clustered on the state. Shown are estimated coefficients from OLS regressions of the number of H-2A or H-2B requests certified on the variables indicated. The H-2A and H-2B variables, real GDP, and number of less-educated U.S.-born workers and less-educated, nonnaturalized Latin American workers are measured as natural logs. Regressions include state and year fixed effects and state-specific linear time trends.
*$p < .1$; **$p < .05$; ***$p < .01$

Table 6. Demand for Less-Skilled Foreign Workers and Number of Unauthorized Immigrants

	H-2A		H-2B		J-1
	(1) National Issued 1995–2018	(2) State Certified 2006–2018	(3) National Issued 1995–2018	(4) State Certified 2006–2018	(5) National Issued 1995–2018
Unemployment rate	−0.108**	−0.084***	0.009	−0.164***	0.019
	(0.041)	(0.014)	(0.090)	(0.032)	(0.018)
Real GDP	−3.257	1.062	8.121	1.392	3.699**
	(3.478)	(0.734)	(8.054)	(1.277)	(1.671)
Number of less-educated U.S.-born workers	0.919	0.357**	4.484	−0.521***	−0.235
	(1.333)	(0.133)	(2.949)	(0.184)	(0.601)
Number of unauthorized immigrants	0.109	0.199	1.148	−0.190	−0.300
	(0.977)	(0.132)	(2.070)	(0.437)	(0.407)
Universal E-Verify requirement	−0.892	−0.111	3.927	−0.940	−0.859
	(1.970)	(0.102)	(4.086)	(0.619)	(0.774)

Source: Authors' calculations.

Note: Standard errors in parentheses, clustered on the state for the state-level regressions. Shown are estimated coefficients from regressions of the number of H-2A, H-2B, or J-1 visas issued or requests certified for the period indicated (in fiscal years) on the variables indicated. The national-level AR(1) regressions include a trend; the state-level OLS regressions include state and year fixed effects and state-specific trends. The H-2A, H-2B, and J-1 variables, real GDP, and number of less-educated U.S. natives and unauthorized immigrants are measured as natural logs.

*p < .1; **p < .05; ***p < .01

presence of a universal E-Verify requirement at the state level.[23]

The results are generally similar to those reported in other studies that included similar variables. Diane Charlton, Marcelo Castillo, and Tom Hertz (2018) find a negative relationship between employer demand for H-2A workers and the state unemployment rate; Madeline Zavodny and Tamar Jacoby (2010) find one between employer demand for H-2B workers and the state unemployment rate. However, Simnitt and coauthors (2018) find a positive relationship between employer demand for H-2A workers and the county unemployment rate. Both Charlton, Castillo, and Hertz (2018) and Simnitt and coauthors (2018) fail to find a significant relationship between employer demand for H-2A workers and state E-Verify laws.

Robustness

The main results do not indicate a clear relationship between employer demand for temporary foreign workers and either our proxy for the number of unauthorized workers or our measure of immigration enforcement. We therefore investigate whether similar null results occur when using other measures of the number of unauthorized immigrants and immigration enforcement.

We first turn to estimates from the Pew Research Center of the number of unauthorized immigrants in the United States. Pew estimates the number of unauthorized immigrants using the *residual method*, which essentially involves estimating the total number of immigrants from a population survey, such as the Current Population Survey or the American Community

23. In results not shown here, classifying North Carolina—which exempts short-term agricultural jobs from E-Verify—as not having an E-Verify requirement does not affect the estimated coefficient on that variable in the specification for H-2A workers.

Survey, and then subtracting an estimate of the number of legal immigrants based on administrative data and migrant characteristics. Using the Pew estimates, we again do not find evidence that employer demand for temporary foreign workers is higher when fewer unauthorized workers are available. As table 6 shows, none of the estimated relationships between our measures of employer demand and Pew's estimates of the unauthorized immigrant population is statistically significant at the national or state level; the pattern of the other coefficients is similar to our earlier results.[24] These null results are surprising given that use of the visa programs has been rising as the number of unauthorized immigrants in the United States has been stagnant or falling. More accurate measures of the number of unauthorized workers might show the expected negative relationship in all specifications. However, overlap between employers who are willing to use the visa programs and those who are willing to hire unauthorized workers may be minimal.

To further investigate whether employers turn to legal temporary foreign workers when fewer unauthorized immigrants are available, we examine the effect of other measures of immigration enforcement other than E-Verify laws. Again, we expect to find that tougher immigration enforcement is associated with higher demand for foreign temporary workers because tougher immigration enforcement should reduce the number of unauthorized workers available. At the national level, we examine two measures of immigration enforcement along the Southwest border: the number of people apprehended along the border by Border Patrol agents, and the number of Border Patrol agents stationed along the border. Higher levels of apprehensions may signal tougher enforcement and hence fewer unauthorized workers available; however, higher levels may also indicate larger inflows of unauthorized immigrants (Hanson 2006), reducing the need for employers to turn to the visa programs. The number of Border Patrol agents is likewise a mixed indicator of unauthorized immigrant inflows. Having more agents makes it harder for unauthorized immigrants to enter the country but may also be a response to increased inflows of unauthorized immigrants (Hanson and Spilimbergo 1999).

The results are mixed, as table 7 shows.[25] The number of H-2A visas issued or workers certified is not significantly related to the number of people apprehended by the Border Patrol along the Southwest border (columns 1 through 3). The number of H-2B visas issued is also not significantly related to apprehensions (columns 4 and 5), but the number of H-2B workers certified is positively related to apprehensions (column 6). The number of J-1 visas issued is also positively related to apprehensions (column 8). The number of Border Patrol agents along the Southwest border is positively related to the number of H-2A visas issued (column 1), but negatively related to the number of H-2B visas issued (columns 4 and 5). These results fail to provide clear evidence on how immigration enforcement affects employer demand for legal temporary foreign workers.

At the state level, we examine five additional measures of immigration enforcement. First, we include a variable for whether a state agency has signed a 287(g) agreement with the federal government. Such an agreement allows that state agency's law enforcement officers to enforce federal immigration laws. Second, we look at whether a statewide law enforcement agency has implemented Secure Communities, a program that identifies jailed immigrants who are deportable and notifies Immigration and Customs Enforcement (ICE). Third, we consider the effect of the annual, statewide number of ICE detainers, which are frequently issued as part of the deportation process. The fourth enforcement variable is the number of immigrants removed from a state under the Se-

24. For brevity, table 6 reports only national-level results for visas issued from FY 1995 through 2018 and state-level results for requests certified from FY 2006 through 2018. National-level results for visas issued and requests certified from FY 2006 through 2018 are similar to those for FY 1995 through 2018.

25. We report only the estimated coefficients for the enforcement variables, but the regressions also include real GDP, the unemployment rate, the number of less-skilled U.S. natives, and the number of less-skilled Latin American immigrants plus the linear trend.

Table 7. Demand for Less-Skilled Foreign Workers and Intensity of National Immigration Enforcement: National-Level Regression Results

	H-2A			H-2B			J-1	
	(1) Issued 1995–2018	(2) Issued 2006–2018	(3) Certified 2006–2018	(4) Issued 1995–2018	(5) Issued 2006–2018	(6) Certified 2006–2018	(7) Issued 1995–2018	(8) Issued 2006–2018
A. Border Patrol apprehensions	−0.119	−0.106	0.020	0.121	1.192	0.444**	0.097	0.195*
	(0.158)	(0.145)	(0.096)	(0.328)	(0.726)	(0.155)	(0.067)	(0.080)
B. Border Patrol agents	1.122***	0.289	−0.017	−1.411**	−3.150**	−0.558	0.093	−0.281
	(0.169)	(0.238)	(0.208)	(0.605)	(0.954)	(0.355)	(0.130)	(0.161)

Source: Authors' calculations.

Note: Standard errors in parentheses. Shown are estimated coefficients from AR(1) regressions of the number of H-2A, H-2B, or J-1 visas issued or requests certified for the period indicated (in fiscal years) on the natural log of the variable indicated. The regressions also include real GDP, the unemployment rate, the number of less-educated U.S.-born workers and less-educated, nonnaturalized Latin American workers, and a trend.

*$p < .1$; **$p < .05$; ***$p < .01$

Table 8. Demand for Less-Skilled Temporary Foreign Workers and Intensity of State Immigration Enforcement: State-Level Regression Results

	H-2A (1)	H-2B (2)
A. 287(g) agreement	−0.104	−0.310*
	(0.233)	(0.154)
B. Secure Communities	−0.226***	−0.170
	(0.065)	(0.174)
C. ICE detainers	0.032	0.073
	(0.021)	(0.067)
D. Secure Communities removals	−0.030***	−0.019
	(0.011)	(0.023)
E. Share of employers enrolled in E-Verify	−0.022**	−0.029*
	(0.009)	(0.016)

Source: Authors' calculations.
Note: Standard errors in parentheses, clustered on the state. Shown are estimated coefficients from OLS regressions of the number of H-2A or H-2B requests certified on the variable indicated. ICE detainers and Secure Communities removals are measured in natural logs. The regressions also include real GDP, the unemployment rate, and the number of less-educated U.S.-born workers and less-educated, nonnaturalized Latin American workers, plus state and year fixed effects and state-specific linear time trends.
*$p < .1$; **$p < .05$; ***$p < .01$

cure Communities program. Last, we consider the impact of the share of state employers enrolled in the E-Verify program.[26] Studies suggest that implementing 287(g) or Secure Communities tends to reduce the number of unauthorized immigrants living in an area, although the effect may be modest (Parrado 2012; Leerkes, Leach, and Bachmeier 2012; Leerkes, Bachmeier, and Leach 2013). High numbers of detainers and removals may signal greater availability of unauthorized workers in an area but may also lead to reductions in the number of unauthorized workers available if unauthorized immigrants leave areas with more detainers and removals. A greater share of employers participating in E-Verify is likely to reduce the number of unauthorized workers in an area. As before, we expect to find positive coefficients if tougher immigration enforcement increases employer demand for legal temporary foreign workers. The regression models continue to include the variables measuring economic and demographic conditions, including our proxy for the number of unauthorized workers (the number of less-educated, non-naturalized Latin American workers).

The results, shown in table 8, do not indicate that tougher enforcement increases demand for the H-2 programs. If anything, the results suggest that tougher enforcement reduces demand for H-2 workers within a state. Alternatively, some omitted factor may cause a state to adopt tougher enforcement and employers to demand fewer H-2 workers. The number of H-2A workers certified is not affected by the presence of a state-level 287(g) agreement, and the number of H-2B workers is significantly lower. The number of H-2A workers certified is lower after a state has joined Secure Communities; the number of H-2B workers is unaffected. The number of H-2A or H-2B workers certified is not affected by the number of ICE detainers

26. We estimate a separate regression with each measure. The regressions also include real GDP, the unemployment rate, the number of less-skilled U.S. natives, and the number of less-skilled Latin American immigrants plus the fixed effects and linear trends. The 287(g) and Secure Communities variables are dummy variables, the detainers and removals variables are measured in natural logs, and the share of employers enrolled in E-Verify is a rate.

issued in a state. The number of immigrants removed in a state under the Secure Communities program is negatively related to the number of H-2A workers certified, and unrelated to the number of H-2B workers certified. The share of employers signed up for E-Verify within a state is negatively related to the number of H-2A and H-2B workers certified. These results thus provide no evidence that employers turn to the H-2A and H-2B programs when immigration enforcement becomes tougher within a state.

POLICY IMPLICATIONS

These results indicate that employer use of the H-2A, H-2B, and J-1 programs increases when labor markets are tighter and economic output is higher. State-level results suggest that employer use of the H-2B program is higher when fewer substitutable U.S.-born workers are available. Somewhat surprisingly, employer use of the programs is not consistently related to the number of less-educated Latin American immigrants in the labor force, or to various measures of immigration enforcement, including requirements that employers use E-Verify. The failure to find that employer demand for the programs increases as the estimated number of unauthorized immigrants falls is particularly surprising given that program use has increased in recent years as the size of the unauthorized immigrant population has failed to keep pace with economic growth. The lack of a strong inverse relationship between the number of visas and measures of unauthorized immigrants may mean that many employers do not see the programs as an alternative to hiring unauthorized immigrants, or perhaps employers who use the programs are not those who typically hire unauthorized immigrants. Employers may turn to labor-saving technology or to U.S. workers instead of legal temporary foreign workers when fewer unauthorized workers are available. Alternatively, it may take time for employers to learn about the programs and how to use them. A further drop in the number of unauthorized immigrant workers—and the continued aging of less-educated U.S.-born workers—could hasten this process and push more employers to use the programs. That is more likely to happen if the programs are modified along several dimensions.

One of the most important modifications is raising the cap on the number of H-2B visas. The program's cap of sixty-six thousand workers per fiscal year has been in place since 1987, even as the economy has more than doubled in size and employment has grown by 50 percent. Not only has the cap been reached each of the last five fiscal years, but it has been reached earlier each year. Demand for H-2B visas was so heavy for the second half of FY 2019 that the Department of Labor's web portal crashed on New Year's Eve 2018 as employers vied to file their labor certification requests at the stroke of midnight when the portal opened (Clozel and Simon 2019). Small, last-minute, and temporary expansions, such as adding thirty thousand visas in FY 2019, fall far short of employer demand for less-skilled temporary workers. In addition, the uncertainty regarding whether and when more visas will become available makes it difficult for employers to plan. The binding cap on H-2B visas and uncertainty about cap expansions may reduce total hiring, including that of American workers in complementary jobs. As then labor secretary Alexander Acosta noted after the web portal crash, the lengthy rule-making process means that any additional visas do not become available until July, well after most seasonal summer jobs in the tourism and hospitality sector need to be filled.

In addition to being higher, the cap on the number of H-2B visas should vary with underlying economic conditions. It makes sense to issue more visas when the unemployment rate is low and output is growing rapidly than during a recession. However, adding more H-2B visas and shifting the number up and down with the business cycle would clearly not cause all employers who currently hire unauthorized immigrants to instead hire H-2B workers. After all, the number of H-2A visas is uncapped, yet about half of all U.S. farmworkers are unauthorized immigrants. The growth in the H-2A program may have enabled employers to offset the near-zero net inflow of unauthorized immigrants over the last decade, but it has not fully substituted for the stock of unauthorized immigrants already living and working in the United States. Raising the cap on the J-1 SWT program and linking it to the business cycle

may also make sense, but more data and study of the program are warranted first.

Unauthorized immigrant workers are often attractive to employers that need to quickly fill jobs requiring little training and few specific skills because unauthorized immigrants are more likely than U.S. natives or legal immigrants to participate in a spot labor market. Historically, unauthorized immigrants have been easy to hire when workers were needed and easy to fire when they were not. Although this is less true today because unauthorized workers are relatively scarce compared with recent decades, some of these workers still gather at day labor sites where employers can hire them on the spot.

The H-2 temporary foreign worker programs are the polar opposite of spot labor markets. To use the visa programs, employers must anticipate the number of workers needed months in advance, fill out lots of forms, try to recruit U.S. workers, and then find foreign workers and have them apply for visas. Employers must comply with rules regarding pay and working conditions—and living conditions, in the case of H-2A workers—that do not apply to unauthorized immigrants. To be more appealing to employers than hiring unauthorized immigrants, the temporary worker programs need to be easier to use, faster, and more flexible.

Making temporary worker programs easier, faster, and more flexible would likely entail reducing the number of steps in the process and the lead times involved. Simplifying the U.S. worker recruitment requirements seems particularly promising. In 2008, the George W. Bush administration modified the H-2 visa programs to allow employers to attest that they had tried to recruit U.S. workers instead of needing to undergo a recruitment process assisted and supervised by the Department of Labor (Bruno 2017). The Barack Obama administration reinstated the recruitment requirement, increasing the costs and complexity of using the programs. Like many aspects of the H-2 programs, the recruitment process is slow and complicated. This makes it difficult for smaller employers in particular to use the program. Moving back to an attestation process should, of course, be accompanied by incentives to follow the rules, such as random audits and penalties for noncompliance. Easing the housing requirement for the H-2A program would also make the program more attractive to employers, especially among those who have not participated in it before, but could make attracting reliable workers more difficult.

Another potential change is expanding the programs from temporary, seasonal jobs to year-round jobs. Because they are trying to fill year-round or permanent positions, dairy farms and other livestock operations and plant nurseries typically cannot use the H-2A program, and many employers that hire less-skilled workers cannot use the H-2B and J-1 programs. The H-1B and TN visa programs allow specialty workers, who typically hold relatively high-skilled jobs, to fill year-round, permanent positions, which establishes a precedent for expanding the other visa programs beyond temporary, seasonal jobs.

Any changes to the H-2 and J-1 programs need to address critics' concerns. Workplace health and safety requirements and minimum wage laws should be enforced. To guard against abuse and trafficking, it is important to enforce provisions that recruiters and employers do not charge fees to H-2 foreign workers and that foreign workers can quit and return home if they want to and are paid the wages they earned. The relatively young age of many J-1 workers may make them particularly vulnerable to exploitation. Currently, payroll taxes for Social Security and Medicare are not assessed on H-2 and J-1 workers, effectively making them cheaper than U.S. workers and potentially putting downward pressure on U.S. workers' wages. Another concern is overstays: some visa holders do not leave when their job ends but instead join the unauthorized workforce. A federal requirement that all employers use E-Verify is key to reducing unauthorized overstays. A nationwide E-Verify mandate and accompanying enforcement will likely be needed for temporary foreign worker programs to significantly reduce use of unauthorized immigrant workers.

Finally, researchers need better data about temporary foreign worker programs. Data on the actual number of workers participating in the various visa programs and more information about the jobs those workers fill would help researchers evaluate the programs and

their effects. The political economy of the programs, including employer lobbying for changes to them, is another area for additional research.

CONCLUSION

This study examines employer demand for less-skilled temporary foreign workers via three major visa programs. Our analysis indicates that economic conditions are the main determinant of employer demand for H-2A, H-2B, and J-1 workers. Surprisingly, we find little evidence that the number of potentially substitutable less-skilled workers—particularly unauthorized immigrants—is related to program usage or that tougher immigration enforcement increased employer demand for legal temporary foreign workers. Although the programs have grown substantially in size in recent years, their numbers still remain small relative to the number of less-skilled workers and unauthorized immigrants in the U.S. labor force. Simplifying the programs and raising the cap on the number of H-2B visas would likely make more employers turn to them, particularly if unauthorized immigration continues to fall.

APPENDIX: DATA SOURCES

Number of H-2A, H-2B, and J-1 visas issued: U.S. Department of State, Visa Statistics, "Nonimmigrant Visa Statistics," https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics/nonimmigrant-visa-statistics.html (accessed May 21, 2020). We include H-2R visas with H-2B visas between FY 2005 and FY 2007.

Number of H-2A and H-2B workers certified: U.S. Department of Labor, Foreign Labor Certification, "OFLC Performance Data," https://www.foreignlaborcert.doleta.gov/performancedata.cfm (accessed May 21, 2020). Only the fifty states and Washington, D.C., (for the H-2B program) are included when creating national totals.

Unemployment rates: U.S. Bureau of Labor Statistics, "Unemployment," https://www.bls.gov/data/#unemployment (accessed May 21, 2020). Annual averages are based on BLS data.

Real GDP: U.S. Bureau of Economic Analysis, http://www.bea.gov (accessed May 21, 2020). Annual data are adjusted for inflation using the CPI-U.

Number of less-educated U.S. natives in the labor force: Authors' calculations of number of U.S. natives in the labor force who have not completed high school based on American Community Survey data for 2004 through 2016. IPUMS USA, "U.S. Census Data for Social, Economic, and Health Research," https://usa.ipums.org/usa (accessed May 21, 2020).

Number of unauthorized immigrants: Pew Research Center, "Unauthorized Immigrant Population Trends for States, Birth Countries and Regions," June 12, 2019, http://www.pewhispanic.org/interactives/unauthorized-trends (accessed May 21, 2020). Estimates are available for 2005, 2010, and every year thereafter through 2017. We linearly interpolate values between 2005 and 2010. The data are estimated to the nearest five thousand. For states with fewer than five thousand unauthorized immigrants (Montana, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming in some or all years), we impute a value of 2,500.

E-Verify laws: Indicator variable for the presence of a statewide law requiring all or almost all employers to use E-Verify, based on Orrenius and Zavodny (2017).

Border Patrol apprehensions along Southwest border: U.S. Customs and Border Protection, "United States Border Patrol, Southwest Border Sectors," https://www.cbp.gov/sites/default/files/assets/documents/2020-Jan/U.S.%20Border%20Patrol%20Fiscal%20Year%20Southwest%20Border%20Sector%20Apprehensions%20%28FY%201960%20-%20FY%202019%29_0.pdf (accessed May 29, 2020).

Border Patrol agents along Southwest border: U.S. Customs and Border Protection, "United States Border Patrol, Border Patrol Agent Nationwide Staffing by Fiscal Year," https://www.cbp.gov/sites/default/files/assets/documents/2019-Mar/Staffing%20FY1992-FY2018.pdf (accessed May 29, 2020).

287(g) agreements and Secure Communities: Indicator variable that a state has signed a 287(g) agreement with DHS or has implemented Secure Communities. For midyear agreements, the fraction of the calendar year is used for the first year. Sarah Bohn provided 287(g) dates. Secure Communities dates are from U.S. Immigration and Customs Enforcement, "Secure Communities: Monthly Statistics

through February 29, 2012," https://www.ice.gov/doclib/foia/sc-stats/nationwide_interoperability_stats-fy2012-to-date.pdf (accessed May 21, 2020).

ICE detainers and Secure Communities removals: TRAC Immigration, "Latest Data: Immigration and Customs Enforcement Detainers," http://trac.syr.edu/phptools/immigration/detain/ (accessed May 21, 2020) and "Removals Under the Secure Communities Program," http://trac.syr.edu/phptools/immigration/secure/ (accessed May 21, 2020).

Share of employers enrolled in E-Verify: Total number of employers that have signed a memorandum of understanding with DHS to use E-Verify, based on data used by Orrenius, Zavodny, and Greer (forthcoming) and U.S. Department of Homeland Security and USCIS, "E-Verify Usage Statistics," https://www.e-verify.gov/about-e-verify/e-verify-data/e-verify-usage-statistics (accessed May 21, 2020), divided by the number of establishments in a state in Quarterly Census of Employment and Wages data, U.S. Bureau of Labor Statistics, "Quarterly Census of Employment and Wages," https://www.bls.gov/cew/ (accessed May 21, 2020). The data are for the fourth quarter except for 2015, when data are for the third quarter.

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