

**THE IMPACT OF H-1B VISA HOLDERS ON
THE U.S. WORKFORCE**

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EXECUTIVE SUMMARY

H-1B visa holders do not adversely affect U.S. workers, according to new research. On the contrary, the evidence points to the presence of H-1B visa holders being associated with lower unemployment rates and faster earnings growth among college graduates, including recent college graduates. Further, the results suggest that, if anything, being in a field with more H-1B visa holders makes it more likely that U.S.-born young college graduates work in a job closely related to their college major. The results here should give pause to policymakers considering imposing additional restrictions on the H-1B program. There is little reason to think doing so will help American workers.

This study uses data from 2005 to 2018 to examine how the number of approved petitions to hire H-1B visa holders as a share of college graduates within each of 22 occupations affects the unemployment rate and earnings growth rate in those occupations. The study analyzes data from U.S. Citizenship and Immigration Services (USCIS) on approved H-1B petitions and American Community Survey (ACS) data on the U.S. workforce. The analysis finds:

- An increase in the share of workers with an H-1B visa within an occupation, on average, reduces the unemployment rate in that occupation. The results indicate that a 1 percentage point increase in the share of workers with an H-1B visa in an occupation reduces the unemployment rate by about 0.2 percentage points. The findings suggest the presence of H-1B visa holders boosts employment among other workers in an occupation. The results provide no evidence that the H-1B program has an adverse impact on labor market opportunities for U.S. workers.
- The results suggest the presence of more H-1B visa holders leads to faster earnings growth for U.S. workers. The magnitude of the estimates suggests that a 1 percentage point increase in the share of workers with an H-1B visa in an occupation boosts the earnings growth rate in that occupation by about 0.1 to 0.26 percentage points. A larger share of H-1B visa holders, therefore, may push up wages and wage growth for U.S. workers. While critics often allege that H-1B visas reduce wages or suppress wage growth, this finding of the opposite is consistent with research showing that H-1B visa holders earn at least as much as similar U.S. workers, if not more.
- The results indicate H-1B visa holders do not adversely affect U.S.-born college graduates during the early years of their careers. Having more approved total or initial H-1B petitions, on average, reduces the unemployment rate within a major-occupation for recent graduates. The results provide no evidence that recent college graduates have worse labor market outcomes if there are more H-1B visa holders in jobs closely related to their college major.

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The results of the research indicate that H-1B visa holders do not adversely affect U.S. workers. As this report shows, the H-1B program is small relative to the size of the college-graduate workforce, likely accounting for at most 2 percent of highly educated U.S. workers. H-1B visa holders are concentrated in computer-related occupations but account for only a small share of workers in information technology (IT) jobs. Despite the H-1B program's small scale, the visa category is important to the U.S. economy and to employers that use it to fill gaps in their workforce. The presence of H-1B visa holders increases innovation, productivity and profits at H-1B employers and boosts total productivity and innovation in the United States.¹

The fact that the H-1B program either improves job opportunities for U.S. workers or has no effect indicates that the program enables employers to hire foreign workers when they cannot hire U.S. workers. The alternative for many employers to using H-1B visas is not to hire more American workers but rather to hire more workers overseas. Many of the skilled, specialized jobs filled by H-1B visa holders and highly educated U.S. workers alike can be done remotely, as seen today, making them vulnerable to offshoring. Keeping those jobs here – and getting the productivity and innovation gains the program results in – requires keeping the H-1B program and limiting restrictions on the visa category.

As the novel coronavirus creates unprecedented challenges, U.S. policymakers are considering imposing further restrictions on immigration in the hopes of improving job opportunities for American workers. One potential target is H-1B temporary visas. Since workers are more productive in the United States than overseas, it makes sense that some employers opt to use H-1B visas to bring in workers instead of opting to send out the work.² In addition to the new findings here, research on the impact of the reduction in the H-1B cap in fiscal year 2004 and on the Great Recession of 2007-2009 supports this, since it showed the country lost many highly productive foreign-born workers due to a lower H-1B annual limit.³ During the Great Recession, employment and wage growth was slower in areas with more H-1B visa denials.⁴

If highly productive workers no longer can work in the United States, the U.S. economy as a whole is worse off. The fact that H-1B visa holders boost innovation further magnifies the adverse economic impact. With the country facing a long and difficult struggle to emerge from the economic downturn, this is not the time to impose additional restrictions that would reduce the number of skilled, innovative workers in the United States.

¹ See Kerr and Lincoln (2010); Hunt (2011); Ghosh, Mayda, and Ortega (2014); Peri, Shih, and Sparber (2015b); and Dimmock, Huang, and Weisbenner (2019).

² Clemens (2013) finds a substantial earnings premium – \$55,000, on average – among software workers for an Indian firm who were randomly awarded an H-1B visa compared with their counterparts who were not. He concludes that a large majority of the premium reflects their higher productivity in the United States.

³ Further, employers already are less likely to retain H-1B workers when economic conditions weaken, and they disproportionately lay off or do not renew less-productive H-1B workers (Depew, Norlander, and Sørensen, 2017).

⁴ Peri et al. (2014).

BACKGROUND

The H-1B temporary foreign workers category allows employers to hire foreign workers to fill jobs in skilled, specialty occupations. The jobs usually must require that workers have at least a bachelor's degree, and foreign workers typically must have at least a bachelor's degree or equivalent experience in order to receive an H-1B visa. The visas are valid for up to three years and can be extended up to 6 years; after that, an H-1B visa holder must have an approved application for legal permanent residence and be waiting for a permanent resident visa (a "green card") to become available in order to receive an extension.

The H-1B visa category imposes several requirements on employers. Employers must agree to pay workers who hold an H-1B visa the higher of the wage the employer pays to other workers with similar experience and qualifications and the prevailing wage for that occupation in the geographic area. Employers classified as H-1B dependent employers or as willful violators of the program in the past before seeking H-1B visa holders within a certain salary and education range must recruit U.S. workers and cannot displace similar U.S. workers. An employer begins the process by filing a labor condition application with the Department of Labor. If the application is approved, the employer files a petition (called Form I-129) with U.S. Citizenship and Immigration Services (USCIS). If the petition is approved, the worker, if outside the country, applies to the Department of State for an H-1B visa. An individual inside the United States, such as an international student, applies for a change of status.

There is a cap on H-1B visa issuances. Up to 65,000 new H-1B petitions are available each fiscal year, and an additional 20,000 are available each fiscal year for workers who have an advanced degree (a master's or higher) from a U.S. university. Institutions of higher education, nonprofit research organizations, and governmental research organizations are exempt from the cap. Extensions, transfers across employers, and requests to work for multiple employers also do not count towards the cap.

The H-1B visa category is one of several temporary visa categories for skilled foreign workers. Employers can access the L-1 category for intracompany transferees, the O-1 category for persons with extraordinary ability, and the TN category for skilled workers from the other NAFTA (now USMCA) countries. Although not without their critics, those visa categories generally are less controversial than the H-1B category, in part because they are smaller than the H-1B program and are used to hire workers in a wider variety of occupations. In most years, the majority of H-1B visa holders are in computer-related occupations.

A key concern with the H-1B visa category is whether it undermines labor market opportunities for American workers. Critics allege that the H-1B program reduces earnings and raises unemployment among American workers and discourages American students from pursuing majors in which they might face competition from H-1B visa

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holders for entry-level positions after graduation. Research has not fully addressed these issues, particularly the impact of H-1B visa holders on recent American college graduates. Case studies of specific occupations suggest that skilled foreign nationals are complements, not substitutes, for American workers.⁵ Research also shows that employers are more likely to submit an LCA to hire an H-1B visa holder if they had more difficulty filling a position, as measured by job posting duration, which suggests that H-1B workers are not taking away jobs from American workers but rather a last resort for employers.⁶ More broadly, research suggests that the presence of H-1B visa holders increases productivity and innovation in the aggregate as well as increasing innovation, productivity, and profits at H-1B employers.⁷

This study examines whether H-1B visa holders reduce labor market opportunities for U.S. workers. To do this, it combines USCIS data on approved H-1B petitions with several measures of employment and earnings among U.S. workers who have graduated from college. The study gives particular attention to U.S.-born recent college graduates adults who presumably would compete the most with H-1B visa holders for entry-level positions. The next section provides an overview of trends in the H-1B visa category, which gives a first look at the data used in this study. A more detailed explanation of the data and the empirical methods used to analyze the data follows. The results of that analysis indicate that unemployment rates are either unchanged or lower when an occupation has a larger share of H-1B visa holders, and earnings growth is the same or higher. The results also suggest that, if anything, a larger share of H-1B visa holders makes it more likely that recent college graduates work in a job closely related to their college major.

H-1B PROGRAM TRENDS

It is difficult to determine the total number of H-1B visa holders in the United States.⁸ The federal government does not report the total number of workers who hold an H-1B visa. Data are available for several stages in the H-1B visa process: The Department of Labor makes available data on labor conditions applications (LCAs); USCIS reports how many H-1B petitions it received and approved; and the Department of State (DOS) reports how many H-1B visas it issued each fiscal year. This report focuses on the data from USCIS, the middle stage of the process, for two reasons. The number of approved petitions is a better proxy for the actual number of H-1B workers than the

⁵ See Peri, Shih, and Sparber (2015a) and Aobdia, Srivastava, and Wang (2018). Bound, Khanna, and Morales (2017) also conclude that complements to H-1B workers in computer-related occupations are complements to U.S. college graduates as a whole even though their simulations find that fewer U.S. college graduates work in computer-related occupations or major in computer science as a result of the H-1B program.

⁶ See Raux (2019). Rothwell and Ruiz (2013) similarly conclude that employers request to hire H-1B workers for jobs that are harder to fill. Raux notes that this may explain why Doran, Gelber, and Isen (2016) find only a modest increase in employment on the margin among firms that win the H-1B lottery—those firms may not be able to hire other workers.

⁷ See Kerr and Lincoln (2010); Hunt (2011); Ghosh, Mayda, and Ortega (2014); Peri, Shih, and Sparber (2015b); and Dimmock, Huang, and Weisbenner (2019).

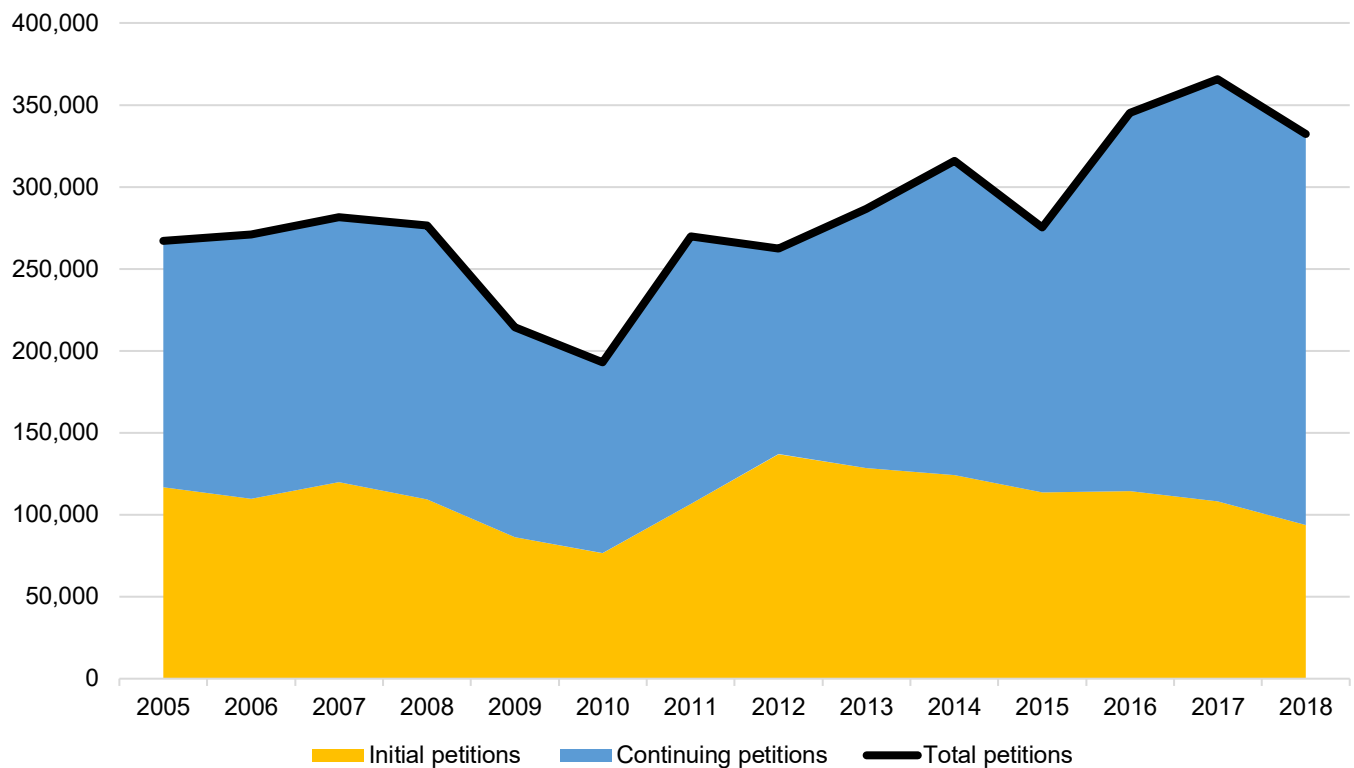
⁸ For a discussion and estimates, see Lowell (2000) and Costa and Rosenbaum (2017).

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total number of LCAs since only a minority of LCAs ultimately result in a visa most years. USCIS reports the number of approved petitions by occupation, whereas the DOS only reports the total number of visas and by country.

Figure 1 shows the number of approved petitions for fiscal years 2005 to 2018. The black line shows the total, while the shaded areas divide the total into initial petitions and continuing petitions. Continuing petitions includes requests for extensions, transfers across employers, and concurrent employment (working for multiple employers) for workers who already hold an H-1B visa.

Figure 1. Approved H-1B petitions, FY 2005-2018



Note: Based on USCIS data available at <https://www.uscis.gov/tools/reports-and-studies>

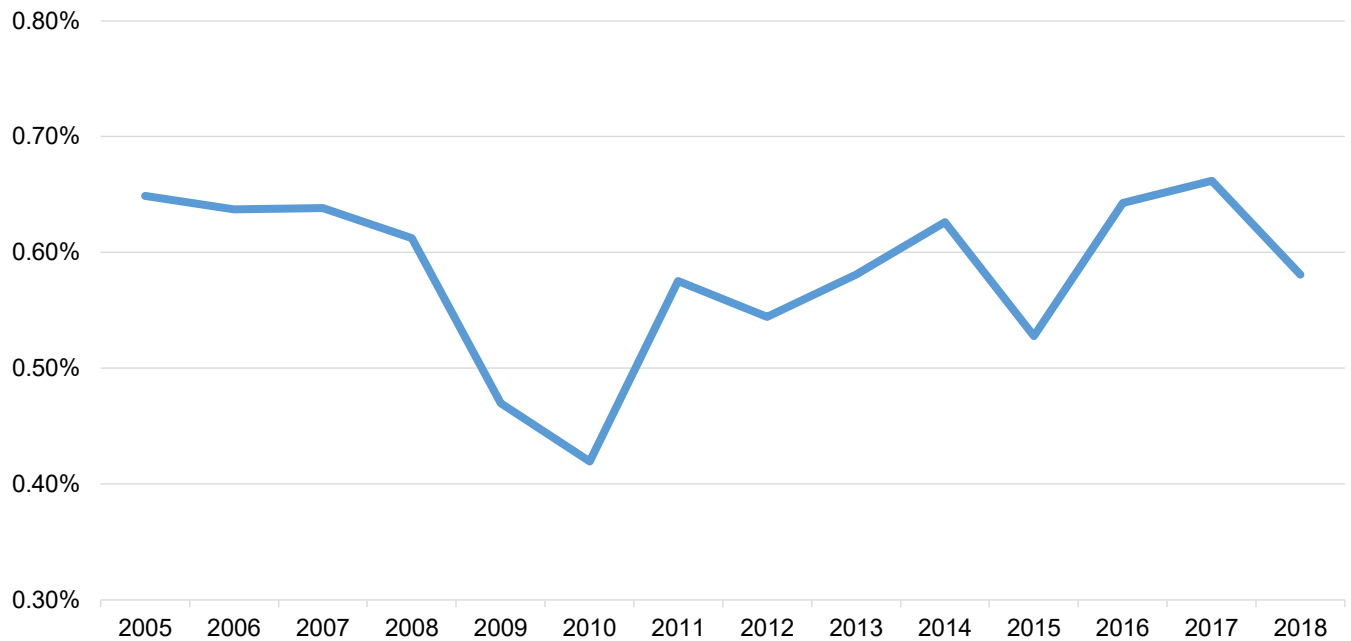
Several patterns are worth noting in Figure 1. The impact of the 2007-2009 recession is evident, with the number of approved petitions falling between 2007 and 2010. (In USCIS data not shown here, the number of petitions filed fell between 2007 and 2009 and rose only slightly from 2009 to 2010.) Since 2012, continuing petitions account for a rising share of approved petitions. This is likely due to the fact that the cap applies only to initial petitions. Since

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the stock of existing H-1B workers has risen over time, mainly because of the growing backlog for permanent resident visas, workers who already have an H-1B visa account for a rising share of petitions as they extend their visas and move across employers.

Although Figure 1 shows a good proxy for the size of the H-1B program, it does not indicate its size relative to the U.S. workforce. Figure 2 shows the total number of approved H-1B petitions relative to the size of the U.S. college-graduate labor force. Approved H-1B petitions are between 0.5 percent and 0.7 percent of the college-graduate labor force most years.⁹ The H-1B program is clearly very small in relative scale. Even if the number of approved petitions is multiplied by three (since the visas are valid for up to three years), the H-1B program would be less than 2 percent of the college-graduate labor force.

Figure 2. Approved H-1B petitions as a share of college-educated labor force, 2005-2018



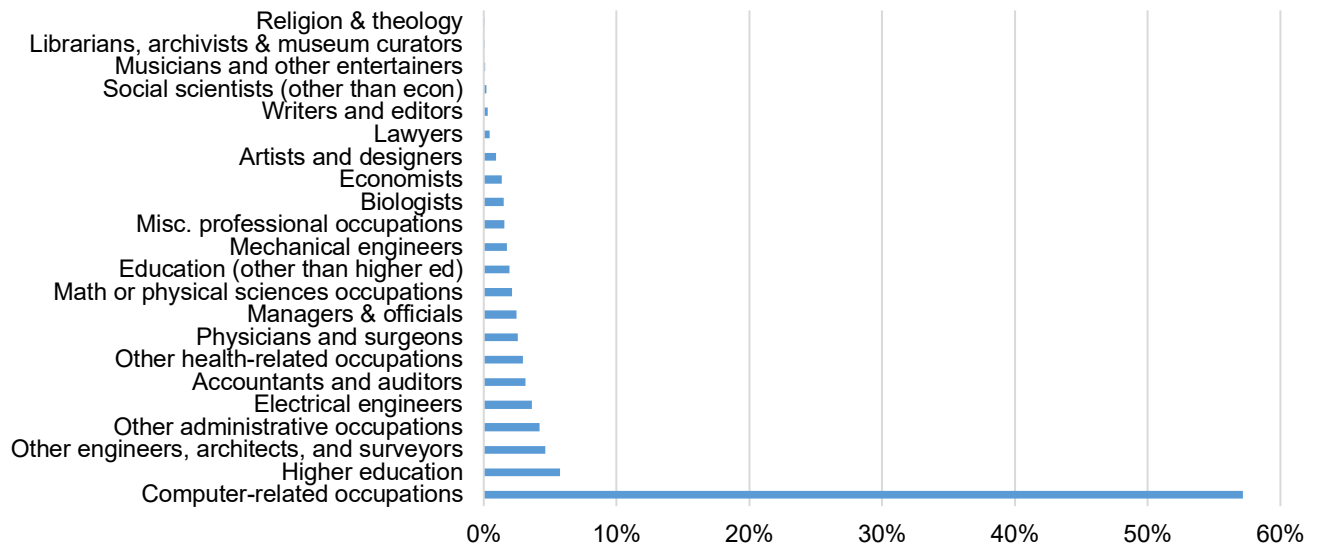
Note: Calculations based on USCIS data available at <https://www.uscis.gov/tools/reports-and-studies> and BLS data available at <https://www.bls.gov/cps/demographics.htm#education>.

⁹ These are underestimates since the BLS labor force data by education only include people ages 25 and older.

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Although H-1B visa holders as a whole are only a very small share of the college-educated workforce, they account for a more substantial share of workers in some occupations. The analysis below relies not only on the variation over time in the number of H-1B workers shown in Figures 1 and 2 but also on variation across occupations. Figure 3 shows the distribution of approved H-1B petitions across the occupations examined in this report. Some of these occupations are broad (most notably, miscellaneous professional occupations) while others are very narrow (e.g., economists). As Figure 3 shows, computer-related occupations account for over one-half of approved H-1B petitions during fiscal years 2005-2018.

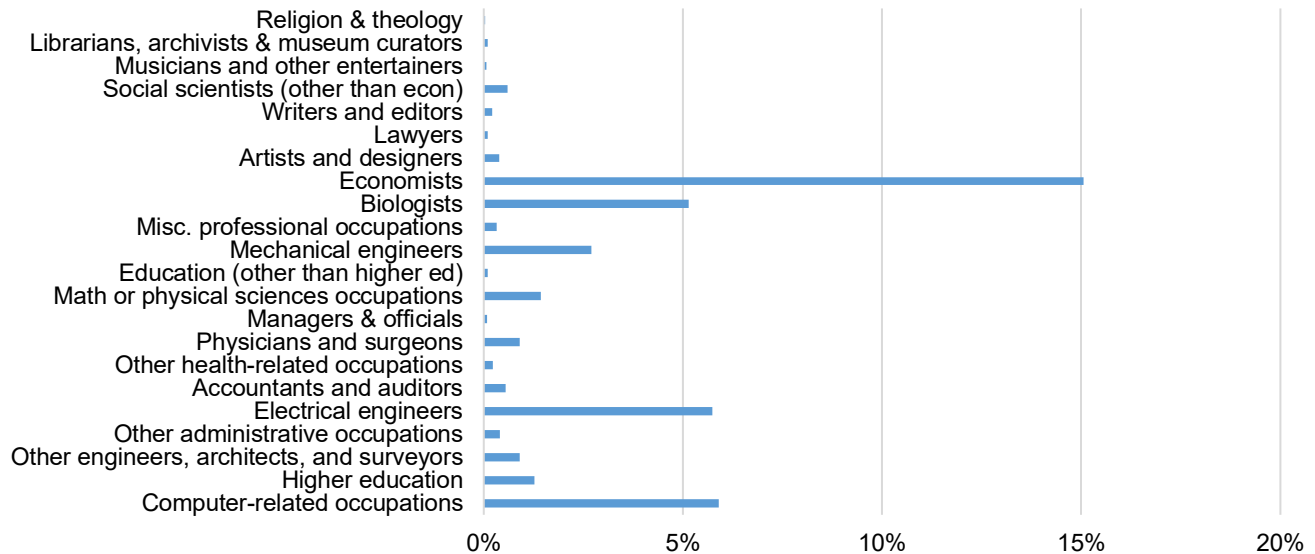
Figure 3. Distribution of approved H-1B petitions across occupations, 2005-2018



Note: Shown is the distribution of approved H-1B petitions across occupation groups with data available for 2005-2018.

Figure 4 shows the number of approved H-1B petitions relative to the number of college-graduate workers by occupation during 2005-2018. Although over one-half of approved H-1B petitions are in computer-related occupations, those approved H-1B petitions comprise only about 6 percent of college-graduate workers in computer-related occupations during the period 2005 to 2018. The share is similar for electrical engineers and only slightly lower for biologists. The share is highest among economists and lowest in religious occupations.

Figure 4. Approved H-1B petitions as share of workforce, by occupation, 2005-2018



Note: Shown is the average of approved H-1B petitions divided by the number of college-graduate workers in that occupation group in American Community Survey data for 2005-2018.

The next section explains the details of how these shares were constructed and then the empirical methods used to examine how those shares appear to affect labor market outcomes.

DATA AND EMPIRICAL METHODS

This study combines data from two sources: USCIS reports on the number of approved H-1B petitions and American Community Survey (ACS) data on the U.S. workforce. This section details each of these data sources and then explains the empirical methods used to analyze the data.

The data on H-1B visa holders are based on USCIS annual reports to Congress on the number and characteristics of H-1B workers.¹⁰ The USCIS reports include the number of initial and continuing petitions for broad and select detailed occupational groups. The data are an overcount of the inflow of new H-1B visa holders since not all approved petitions result in an H-1B visa being issued and then used, but they are an undercount of the stock of continuing H-1B workers since the number of continuing petitions only includes renewals, transfers, and concurrent

¹⁰ The USCIS data are available at <https://www.uscis.gov/tools/reports-and-studies>.

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employment. That said, some continuing workers are counted in the data multiple times within a fiscal year since an amended petition must be filed each time a worker moves to a new project or a new location.¹¹ Nonetheless, as explained above, the data offer the best available measure of the number of H-1B visa holders at the occupational level. This analysis uses all major or detailed occupation groups that had data available for every fiscal year during 2005 to 2018 and that could be matched to occupation groups in the ACS.¹²

The ACS is a large-scale, nationally representative survey that asks participants about their demographic characteristics and labor market outcomes, among other questions. This study uses ACS data from 2005 to 2018 – the most recent year of data available – on college graduates who are between ages 21 and 64.¹³ The ACS asks everyone age 16 or older who is currently working or has worked within the last five years to report their occupation. Using those occupations, this study created unemployment rates and the growth rate of real (inflation-adjusted) median annual earnings for the occupation groups available in the USCIS data.¹⁴ Those occupation-specific unemployment rates and earnings growth rates are the core of the analysis here. This study does not exploit any geographic variation in where H-1B visa holders are since most of the occupations held by H-1B workers are national, not local, labor markets. Many employers recruit and hire workers from around the country – and abroad – to fill jobs in these professional occupations.

The basic regression model used to analyze the data is

$$\text{Outcome}_{ot} = \alpha + \beta \text{H-1B workers/Labor force}_{ot} + \text{Occupation}_o + \text{Year}_t + \varepsilon_{ot},$$

where *Outcome* is the unemployment rate or earnings growth rate in occupation *o* and year *t* in most of the analysis. The key independent variable is the number of approved H-1B petitions relative to the number of college-graduate workers in that occupation and year. This variable gives a measure of the relative scale of H-1B workers. If having more H-1B visa holders worsens labor market outcomes by increasing the competition for jobs in that occupation and year, then the estimated coefficient on that variable, β , should be positive in the unemployment rate regressions

¹¹ For a discussion, see <https://nfap.com/wp-content/uploads/2020/02/H-1B-Denial-Rates-Analysis-of-FY-2019-Numbers.NFAP-Policy-Brief.February-2020-1.pdf>.

¹² Some of the occupations examined here are a major occupation group minus a detailed occupation (e.g., other administrative occupations is “occupations in administrative specializations” minus “accountants, auditors and related occupations”). Life sciences minus biological sciences is excluded from the analysis here because of a discrepancy in the USCIS data that cannot be resolved. USCIS data by fiscal year are matched with ACS data by calendar year.

¹³ The ACS first fielded a nationally representative sample of people who do not live in group quarters in 2005. Only people who do not live in group quarters are included in the analysis. ACS person weights are used throughout the analysis. The ACS data are from IPUMS (<https://usa.ipums.org>).

¹⁴ The earnings data are deflated using the CPI for Urban Wage Earners and Clerical Workers. The earnings growth rate is the percentage change in real median earnings between year *t* and year *t-1*; regressions using that variable include one fewer observation per occupation than the unemployment rate regressions since nationally representative data are not available for 2004.

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and negative in the earnings growth rate regressions. The regressions do not control for the age, sex, or race/ethnicity distribution of workers within occupation-years since the presence of H-1B workers might affect those distributions.¹⁵

Some of the regressions also include year fixed effects or occupation and year fixed effects. The year fixed effects capture changes over time shared by all occupations, such as changes in immigration policy, while the occupation fixed effects capture time-invariant differences across occupations. The fixed effects – particularly the occupation ones – absorb a considerable amount of the variation in the data since the time series is short (14 years for the unemployment rate regressions and 13 for the earnings growth regressions) and the number of occupations is small (only 22). The usual preferred specification when using panel data like these is a two-way fixed effects model, which includes both sets of fixed effects (and sometimes unit-specific time trends as well), but caution is warranted with a small, short panel like this. The last term in the equation, ε , is the error term.¹⁶ Standard errors are clustered on the occupation, and observations are weighted using the size of the labor force in the occupation-year.

Figure 5 gives a visual depiction of the weighted observations of the number of H-1B visa holders relative to the number of college-graduate workers in an occupation-year and the unemployment rate in that occupation-year. The size of the bubbles is proportional to the number of workers in that occupation-year. The regressions find the line that is the best fit with the data, giving more importance to bigger bubbles.

¹⁵ At the firm level, Kerr, Kerr, and Lincoln (2015) find evidence suggestive of changes in the age structure of workers in response to hiring H-1B workers.

¹⁶ A second cautionary note is that the number of H-1B workers may be endogenous in the regressions since shocks to labor market outcomes in an occupation-year, the ε term, also may affect demand for H-1B workers in that occupation-year. Such endogeneity would bias the regressions toward finding more favorable results than would be the case if the number of H-1B workers was randomly determined. The usual technique to control for endogeneity is to find a variable that is associated with the number of H-1B workers in an occupation-year but not associated with shocks to labor market outcomes in that occupation-year. Unfortunately, no such variable presents itself here.

Figure 5. Approved H-1B petitions as share of workforce and unemployment rate, by occupation



Note: Each bubble represents an occupation-year combination. The size of the bubbles reflects the relative number of workers in the occupation-year.

RESULTS

The number of approved H-1B petitions as a share of the workforce in an occupation is not significantly related to the unemployment rate in that occupation when either no fixed effects or year fixed effects are included in the regression. As the first two columns of Table 1 show, this null result occurs when looking at total petitions, initial petitions, or continuing petitions. When both occupation and year fixed effects are included (column 3), the estimated relationship between approved H-1B petitions as a share of the workforce and the unemployment rate becomes negative. This indicates that an increase in the share of workers with an H-1B visa within an occupation reduces the unemployment rate in that occupation, on average. The magnitude of the estimated coefficients indicates that a 1 percentage point increase in the share of workers with an H-1B visa reduces the unemployment rate by about 0.2 percentage points. Notably, an estimated magnitude of that effect is too large to be a purely

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compositional effect due to the presence of H-1B workers.¹⁷ Instead, it suggests that the presence of H-1B workers boosts employment among other workers in an occupation.

Table 1: Estimated relationship between approved H-1B petitions as a share of workers and unemployment rate or real earnings growth rate, by occupation, 2005-2018

	Unemployment rate			Real earnings growth rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Total petitions	-0.002 (0.039)	0.016 (0.039)	-0.200*** (0.070)	0.107*** (0.032)	0.091** (0.042)	0.171 (0.210)
Initial petitions	0.037 (0.100)	0.048 (0.100)	-0.292*** (0.086)	0.231** (0.095)	0.259** (0.097)	0.488 (0.322)
Continuing petitions	-0.018 (0.062)	0.022 (0.060)	-0.168** (0.075)	0.180*** (0.047)	0.133* (0.072)	0.057 (0.304)
Year fixed effects	No	Yes	Yes	No	Yes	Yes
Occupation fixed effects	No	No	Yes	No	No	Yes

* p < 0.1; ** p < 0.05; *** p < 0.01

Note: Shown are estimated coefficients from weighted least squares regressions of the number of approved H-1B petitions from USCIS data on the unemployment rate or the real earnings growth rate by occupation from ACS data (see text for details). Only college graduates ages 21-64 are included in the ACS sample. Standard errors are clustered on the occupation.

The number of approved H-1B petitions as a share of the college-graduate workforce is positively related to earnings growth in an occupation when either no fixed effects or year fixed effects are included in the regression, as shown in columns 4 and 5 of Table 1. These results suggest the presence of more H-1B visa holders leads to faster earnings growth. The magnitude of the estimates suggests that a 1 percentage point increase in the share of workers with an H-1B visa in an occupation boosts the earnings growth rate in that occupation by about 0.1 to 0.26 percentage points. In results not shown here, the H-1B variable is also positively related to real earnings levels, not just earnings growth rates. While critics of the program often allege that it reduces wages or suppresses wage growth, this finding of the opposite is consistent with research showing that H-1B visa holders earn at least as much as similar U.S. workers, if not more.¹⁸ A larger share of H-1B visa holders therefore may push up wages and wage growth for U.S. workers. Other research shows that the converse – having fewer H-1B workers reduces wage

¹⁷ Migrants who hold an H-1B visa cannot remain long in the United States if they are unemployed. Occupations with a larger share of H-1B workers therefore have a slightly lower unemployment rate due to their composition.

¹⁸ See Mithas and Lucas (2010); Hunt (2011); Lofstrom and Hayes (2011); and Rothwell and Ruiz (2013). However, Bourveau et al. (2019) find that newly hired H-1B workers earn less than their U.S.-citizen counterparts at a Big 4 accounting firm. Despite this, they find evidence of a null or small positive impact on U.S. citizens' wages, which is consistent with complementarities or synergies.

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growth.¹⁹ The estimated magnitudes here are again consistent with H-1B workers having a positive effect on other workers' earnings, not just a compositional effect. The estimated coefficients lose statistical significance when occupation fixed effects are added to the regressions. However, in results not shown here, the positive effect of total or continuing H-1B workers remains significant when occupation fixed effects are included in regressions examining the level of real earnings instead of the growth rate.

While Table 1 shows results for college graduates ages 21 to 64 as a whole, young adults may compete the most with H-1B visa holders for entry-level jobs whereas more-established older workers are relatively immune from such competition. Table 2 therefore shows the results if only college graduates ages 21 to 25 are used to create the measures of the labor force, unemployment rates, and earnings growth rates. The sample is further limited to only U.S.-born young adults since policymakers may be focused on the program's impact on U.S. natives.

Table 2 reports the results, which indicate that none of the three measures of the share of H-1B workers has a significant effect, either positive or negative, on unemployment rates among U.S.-born young adults. The results again suggest a positive impact on earnings growth, although the effect is not significant when occupation fixed effects are added to the regressions. These results thus provide no reason to believe that H-1B visa holders adversely affect U.S.-born college graduates during the early years of their careers.

¹⁹ Peri et al. (2014).

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Table 2: Estimated relationship between approved H-1B petitions as a share of U.S.-born young adults and unemployment rate or real earnings growth rate, by occupation, 2005-2018

	Unemployment rate			Real earnings growth rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Total petitions	-0.006 (0.004)	-0.005 (0.004)	-0.002 (0.006)	0.021*** (0.005)	0.019*** (0.005)	0.015 (0.055)
Initial petitions	-0.014 (0.010)	-0.014 (0.010)	-0.012 (0.007)	0.054*** (0.012)	0.050*** (0.014)	0.022 (0.084)
Continuing petitions	-0.010 (0.006)	-0.008 (0.006)	0.003 (0.010)	0.032*** (0.008)	0.029*** (0.009)	0.015 (0.069)
Year fixed effects	No	Yes	Yes	No	Yes	Yes
Occupation fixed effects	No	No	Yes	No	No	Yes

* p < 0.1; ** p < 0.05; *** p < 0.01

Note: Shown are estimated coefficients from weighted least squares regressions of the number of approved H-1B petitions from USCIS data on the unemployment rate or the real earnings growth rate by occupation from ACS data (see text for details). Only U.S.-born college graduates ages 21-25 are included in the ACS sample. Standard errors are clustered on the occupation.

College majors offer another way to consider whether H-1B visa holders affect labor market opportunities for young adults. Recent college graduates might be more likely than older adults to be working in or looking for jobs that are closely connected to their college major. In 2009, the ACS began asking college graduates about their major field of study for their bachelor’s degree. This analysis uses those responses for U.S.-born young adults (ages 21 to 25) who have a bachelor’s degree to again create the labor force, unemployment rate, and real earnings growth rate for six majors that are closely connected to occupations: accounting; biology; computer science; electrical engineering; mathematics and physical sciences; and mechanical engineering.²⁰ Those areas – STEM plus accounting – account for the lion’s share of H-1B visas. The analysis examines the relationship between the number of approved H-1B petitions in each of those six areas relative to the number of young adults with a bachelor’s degree in those areas and their unemployment rates and real earnings growth rates. The measure of H-1B workers is now relative to the number of U.S.-born young college graduates who report a given major and therefore might be qualified to work in that occupation, not relative to the number who report a given occupation.

Table 3 reports the estimates. The results do not indicate a significant relationship between the share of H-1B workers and the unemployment rate when no fixed effects or year fixed effects are included in the regressions (columns 1 and 2). When major-occupation fixed effects are added (column 3), having more approved total or initial

²⁰ Computer science majors are matched to computer-related occupations in the ACS and USCIS data. Young adults who have a master’s degree or higher are not included in this portion of the analysis since the ACS does not ask about the field of study for graduate degrees.

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H-1B petitions reduces the unemployment rate within a major-occupation, on average. The earnings growth rate regressions indicate that having more approved initial H-1B petitions boosts the earnings growth rate within majors-occupations as well (row 2, column 6). Most of the other results do not indicate an effect on earnings growth, either positive or negative. In short, the results in Table 3 provide no evidence that recent college graduates have worse labor market outcomes if there are more H-1B visa holders in jobs closely related to their college major.

Table 3: Estimated relationship between approved H-1B petitions as a share of U.S.-born young adults and unemployment rate or real earnings growth rate, by major-occupation match, 2009-2018

	Unemployment rate			Real earnings growth rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Total petitions	0.001 (0.001)	0.002 (0.001)	-0.030*** (0.003)	0.008 (0.004)	0.002 (0.006)	-0.002 (0.086)
Initial petitions	0.002 (0.002)	0.002 (0.003)	-0.045*** (0.006)	0.026* (0.011)	0.020 (0.014)	0.122** (0.044)
Continuing petitions	0.002 (0.001)	0.004 (0.002)	-0.013 (0.011)	0.009 (0.006)	-0.002 (0.010)	-0.153 (0.125)
Year fixed effects	No	Yes	Yes	No	Yes	Yes
Major-occupation fixed effects	No	No	Yes	No	No	Yes

* p < 0.1; ** p < 0.05; *** p < 0.01

Note: Shown are estimated coefficients from weighted least squares regressions of the number of approved H-1B petitions from USCIS data on the unemployment rate or the real earnings growth rate by major-occupation match from ACS data (see text for details). Only U.S.-born young adults ages 21-25 who have at bachelor’s degree are included in the ACS sample. Standard errors are clustered on the major-occupation.

Lastly, the analysis examines whether H-1B visa holders affect whether recent college graduates are working in a job related to their major. For each of the six majors, the analysis created the share of U.S.-born young adults with that major who work in an occupation closely connected to that major. For example, the variable is, among U.S.-born young college graduates who majored in computer science, the share who are working in a computer-related occupation. Two versions of those shares were created using the ACS data. One includes only U.S.-born young college graduates who were working at the time of the survey (the “conditional” sample), and the other includes all U.S.-born young college graduates and classifies those who are not working at the time of the survey as not working in an occupation closely connected to that major (the “unconditional” sample). Of course, it is not necessarily desirable to have all college graduates work in an occupation related to their major, and some may find it more lucrative to work in an unrelated occupation. Nonetheless, looking at whether H-1B workers affect whether college graduates work in an occupation related to their major may provide some insight into the program’s effects.

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Table 4 shows the estimated relationship between the share of H-1B visa holders and the share of U.S.-born young college graduates working in an occupation closely related to their major. Looking only at young college graduates who are currently working, all three measures of the share of H-1B workers are positively related to the share of young college graduates in jobs that are closely related to their major when no fixed effects or year fixed effects are included (columns 1 and 2). The coefficients become insignificantly different from zero when occupation fixed effects are added (column 3). The pattern of the results is similar when young college graduates who are not working are included in the ACS sample (columns 4-6). The results again provide no evidence that the H-1B program has an adverse impact on labor market opportunities for U.S. workers.

Table 4: Estimated relationship between approved H-1B petitions as a share of U.S.-born young adults in major and share of U.S.-born young adults working in an occupation related to their major, 2009-2018

	Conditional on working			Unconditional on working		
	(1)	(2)	(3)	(4)	(5)	(6)
Total petitions	0.220*** (0.030)	0.222*** (0.032)	-0.012 (0.007)	0.188*** (0.026)	0.189*** (0.028)	0.008 (0.006)
Initial petitions	0.559*** (0.078)	0.568*** (0.084)	-0.019 (0.012)	0.478*** (0.067)	0.486*** (0.073)	0.018 (0.010)
Continuing petitions	0.338*** (0.046)	0.342*** (0.049)	-0.005 (0.007)	0.287*** (0.040)	0.290*** (0.043)	-0.004 (0.005)
Year fixed effects	No	Yes	Yes	No	Yes	Yes
Major-occupation fixed effects	No	No	Yes	No	No	Yes

* p < 0.1; ** p < 0.05; *** p < 0.01

Note: Shown are estimated coefficients from weighted least squares regressions of the number of approved H-1B petitions from USCIS data on the unemployment rate or the real earnings growth rate by major-occupation match from ACS data (see text for details). Only U.S.-born employed young adults ages 21-25 who have at bachelor's degree are included in the ACS sample. Standard errors are clustered on the major-occupation.

DISCUSSION AND CONCLUSION

Policymakers are considering imposing further restrictions on U.S. immigration in the hopes of improving job opportunities for American workers in the wake of the devastating novel coronavirus and the resultant economic downturn. The H-1B temporary worker program for skilled, specialty workers may be a target, particularly since critics alleged that the program reduced wages and employment for American workers even when the U.S. economy was growing. Previous research on the program's effects does not reach a clear consensus, but multiple studies point out that H-1B visa holders earn more than comparable American workers and that the program has a positive impact on productivity and innovation. This study adds a thorough, up-to-date examination of the relationship between approved H-1B petitions as a share of workers in an occupation and the unemployment rate and real

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earnings growth rate in that occupation. The results indicate that H-1B visa holders do not adversely affect U.S. workers. On the contrary, many of the results point to lower unemployment rates and faster earnings growth among college graduates, including recent college graduates. Further, the results suggest that, if anything, being in a field with more H-1B visa holders makes it more likely that U.S.-born young college graduates work in a job closely related to their college major.

Why doesn't the H-1B program have a negative impact, on average? The existence of the H-1B program causes some employers to expand – or at least not decrease – the number of jobs open to American workers, even workers who hold jobs similar to those held by H-1B workers. If not enough U.S. workers are available and an employer cannot use the H-1B program, the employer may move jobs in a given position overseas, ultimately reducing job opportunities for American workers.²¹ The evidence indicates that some employers turn to the H-1B program not because it enables them to hire workers more cheaply but because they cannot otherwise hire workers at all in the United States.²² After all, the bulk of the evidence indicates that H-1B visa holders earn more than comparable American workers, on average, even before considering the substantial additional costs involved in using the H-1B visa category.²³ Since workers are more productive in the United States than overseas, it makes sense that some employers opt to use H-1B visas to bring in workers instead of opting to send out the work.²⁴ After all, many of the skill-intensive jobs that H-1B and American workers hold can be done remotely, as the coronavirus pandemic has demonstrated. Keeping those jobs in the United States requires keeping the H-1B program and limiting additional restrictions.

The results here should give pause to policymakers considering imposing additional restrictions on the H-1B program. There is little reason to think doing so will help American workers. In addition to the new findings here, research on the impact of the reduction in the H-1B cap in fiscal year 2004 and on the Great Recession of 2007-2009 supports this.²⁵ Not surprisingly, the reduction in the cap from 195,000 to 65,000 in 2004 led a reduction in H-1B hiring. Surprisingly, the reduction was concentrated at the top and bottom of the wage distribution.²⁶ While losing

²¹ Glennon (2019) shows that restrictions on the H-1B program cause U.S. parent companies to increase employment at their foreign affiliates and to shift innovation to those foreign affiliates.

²² See Raux (2019).

²³ Mithas and Lucas (2010); Hunt (2011); and Lofstrom and Hayes (2011). The filing fees for the Form I-129 petition is \$460. Non-exempt employers with 1 to 25 workers must pay a "training" fee of \$750, while employers with 26 or more workers must pay \$1500. H-1B or L1 dependent employers must pay an additional \$4000 fee. The premium processing fee is \$1440. The fraud prevention fee is \$500. Most employers must pay attorney fees as well for assistance with filing the forms.

²⁴ Clemens (2013) finds a substantial earnings premium – \$55,000, on average – among software workers for an Indian firm who were randomly awarded an H-1B visa compared with their counterparts who were not. He concludes that a large majority of the premium reflects their higher productivity in the United States.

²⁵ Further, employers already are less likely to retain H-1B workers when economic conditions weaken, and they disproportionately lay off or do not renew less-productive H-1B workers (Depew, Norlander, and Sørensen, 2017).

²⁶ Mayda et al. (2018). Kato and Sparber (2013) also indicate reducing the number of H-1B visas has a disproportionate effect on the highest-ability individuals, who have the most options. Xu (2018) indicates that the reduction in the H-1B cap in 2004

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the bottom might not be a major concern to policymakers, losing the top should be since those highly compensated workers presumably are highly productive. If highly productive workers no longer can work in the United States, the U.S. economy as a whole is worse off. The fact that H-1B visa holders boost innovation further magnifies the adverse economic impact. During the Great Recession, employment and wage growth was slower in areas with more H-1B visa denials.²⁷ With the country facing a long and difficult struggle to emerge from the economic downturn, this is no time to impose additional restrictions that would reduce the number of skilled, innovative workers in the United States.

also reduced investment by firms, which has negative long-run implications for economic growth as well as negative shorter-run implications for gross domestic product (GDP).

²⁷ Peri et al. (2014).

REFERENCES

- Aobdia, Daniel, Anup Srivastava, and Erqiu Wang (2018). "Are Immigrants Complements or Substitutes? Evidence from the Audit Industry." *Management Science* 64(5): 1997-2012. <https://doi.org/10.1287/mnsc.2016.2707>.
- Bound, John, Gaurav Khanna, and Nicolas Morales (2017). "Understanding the Economic Impact of the H-1B Program on the U.S." National Bureau of Economic Research Working Paper No. 23153. <https://doi.org/10.3386/w23153>.
- Bourveau, Thomas, Derrald Stice, Han Stice, and Roger M. White (2019). "H-1B Visas and Wages in Accounting: Evidence from Deloitte's Payroll." Mimeo, Columbia University Business School.
- Costa, Daniel, and Jennifer Rosenbaum (2017). "Temporary Foreign Workers by the Numbers." Washington, DC: Economic Policy Institute. <https://www.epi.org/publication/temporary-foreign-workers-by-the-numbers-new-estimates-by-visa-classification/>.
- Clemens, Michael A. (2013). "Why Do Programmers Earn More in Houston than Hyderabad? Evidence from Randomized Processing of US Visas." *American Economic Review: Papers & Proceedings* 103(3): 198-202. <https://doi.org/10.1257/aer.103.3.198>.
- Depew, Briggs, Peter Norlander, and Todd A. Sørensen (2017). "Inter-Firm Mobility and Return Migration Patterns of Skilled Guest Workers." *Journal of Population Economics* 30: 681-721. <https://doi.org/10.1007/s00148-016-0607-y>.
- Dimmock, Stephen G., Jiekun Huang, and Scott J. Weisbenner (2019). "Give Me Your Tired, Your Poor, Your High-Skilled Labor: H-1B Lottery Outcomes and Entrepreneurial Success." National Bureau of Economic Research Working Paper No. 26392. <https://doi.org/10.3386/w26392>.
- Doran, Kirk, Alexander Gelber, and Adam Isen (2016). "The Effects of High-Skilled Immigration Policy on Firms' Evidence from Visa Lotteries." Mimeo, University of Notre Dame.
- Ghosh, Anirban, Anna Maria Mayda, and Francesc Ortega (2014). "The Impact of Skilled Foreign Workers on Firms: An Investigation of Publicly Traded U.S. Firms." IZA Discussion Paper No. 8684. <http://ftp.iza.org/dp8684.pdf>.
- Glennon, Britta (2019). "How Do Restrictions on High-Skilled Immigration Affect Offshoring? Evidence from the H-1B Program." Mimeo, University of Pennsylvania Wharton School of Business.
- Hunt, Jennifer (2011). "Which Immigrants Are Most Innovative and Entrepreneurial? Distinctions by Entry Visa." *Journal of Labor Economics* 29(3): 417-457. <https://doi.org/10.1086/659409>.
- Kato, Takao, and Chad Sparber (2013). "Quotas and Quality: The Effect of H-1B Visa Restrictions on the Pool of Prospective Undergraduate Students from Abroad." *Review of Economics and Statistics* 95(1): 109-126. https://doi.org/10.1162/REST_a_00245.
- Kerr, Sri P., William Kerr, and William Lincoln (2015). "Skilled Immigration and the Employment Structures of US Firms." *Journal of Labor Economics* 33(S1): S147-S186. <https://doi.org/10.1086/678986>.
- Kerr, William, and William Lincoln (2010). "The Supply Side of Innovation: H-1B Visa Reforms and U.S.

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Ethnic Invention.” *Journal of Labor Economics* 28(3): 473-508. <https://doi.org/10.1086/651934>.

Lofstrom, Magnus, and Joseph Hayes (2011). “H-1Bs: How Do They Stack Up to US Born Workers?” IZA Discussion Paper No. 6259. <http://ftp.iza.org/dp6259.pdf>

Lowell, B. Lindsay (2000). “H-1B Temporary Workers: Estimating the Population.” University of California, San Diego Center for Comparative Immigration Studies Working Paper No. 12.

Mayda, Anna Maria, Francesc Ortega, Giovanni Peri, Kevin Shih, and Chad Sparber (2018). “The Effect of the H-1B Quota on the Employment and Selection of Foreign-Born Labor.” *European Economic Review* 108: 105-128. <https://doi.org/10.1016/j.euroecorev.2018.06.010>.

Mithas, Sunil, and Henry C. Lucas, Jr. (2010). “Are Foreign IT Workers Cheaper? U.S. Visa Policies and Compensation of Information Technology Professionals.” *Management Science* 56(5): 745-765. <https://doi.org/10.1287/mnsc.1100.1149>.

Peri, Giovanni, Kevin Shih, Chad Sparber, and Angie Marek Zeitlin (2014). “Closing Economic Windows: How H-1B Visa Denials Cost U.S.-Born Tech Workers Jobs and Wages during the Great Recession.” New York: Partnership for a New American Economy. https://www.newamericaneconomy.org/wp-content/uploads/2014/06/pnae_h1b.pdf.

Peri, Giovanni, Kevin Shih, and Chad Sparber (2015a). “Foreign and Native Skilled Workers: What Can We Learn from H-1B Lotteries?” National Bureau of Economic Research Working Paper No. 21175. <https://doi.org/10.3386/w21175>.

Peri, Giovanni, Kevin Shih, and Chad Sparber (2015b). “STEM Workers, H-1B Visas, and Productivity in US Cities.” *Journal of Labor Economics* 33(S1): S225–S255. <https://doi.org/10.1086/679061>.

Raux, Morgan (2019). “Looking for the ‘Best and Brightest’: Hiring Difficulties and High-Skilled Foreign Workers.” Aix-Marseille School of Economics Working Paper No. 134.

Rothwell, Jonathan, and Neil Ruiz (2013). “H-1B Visas and the Stem Shortage.” Washington, DC: Brookings Institution. <https://www.brookings.edu/research/h-1b-visas-and-the-stem-shortage/>.

Xu, Sheng-Jun (2018). “Skilled Labor Supply and Corporate Investment: Evidence from the H-1B Visa Program.” Mimeo, University of Alberta School of Business.

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