Discussion Paper Series

IZA DP No. 18487

March 2026

The H-1B Wage Gap, Visa Fees, and Employer Demand

George J. Borjas
Harvard Kennedy School and IZA@LISER

IZA@LISER NETWORK
ISSN: 2365-9793

IZA DP No. 18487 March 2026

The H-1B Wage Gap, Visa Fees, and Employer Demand*

Abstract

The H-1B program lets firms hire high-skill foreign workers for a six-year term. The annual number of visas allocated to for-profit firms is capped at 85,000 and there is excess demand for those visas. The analysis merges administrative data, including the I-129 petitions that report the wage offer made to specific H-1B beneficiaries, with the American Community Surveys. On average, H-1B workers earn 15 percent less than comparable natives, suggesting that firms may be willing to pay a one-time fee to obtain the visas. The data are examined using a labor demand model to simulate how a fee alters the hiring decision. For moderate levels of excess demand, the revenue maximizing fee ranges from \$97,000 to \$154,000 after allowing for unobserved productivity gains or costs associated with an H-1B hire, and for wage growth and job turnover in the H-1B workforce. The fee also changes the skill composition of that workforce, making it more skilled.

JEL classification

J08,J18,J69

Keywords

high-skill immigration, H-1B program, visa fees

Corresponding author

George J. Borjas
george_borjas@hks.harvard.edu

* I am grateful to Nate Breznau, Hugh Cassidy, Kirk Doran, Anthony Edo, Richard Freeman, Daniel Hamermesh, Gordon Hanson, Ron Hira, Daniel Di Martino, Joan Monras, Gautam Nair and Robert VerBruggen for valuable suggestions.

I. Introduction

A key insight of the literature on the economics of immigration is that international labor flows produce larger economic gains for the receiving country when the flow is composed of high-skill workers (Blau and Mackie, 2017). The reason is obvious: High-skill immigrants produce more tax revenue and are less reliant on social assistance programs. In addition, high-skill immigrants may generate human capital spillovers that increase the productivity of other workers.

Not surprisingly, many countries have enacted visa programs that target and try to attract high-skill workers, including the Express Entry System in Canada, the National Innovation Visa in Australia, and the Blue Card in the European Union (OECD, 2024). The United States uses the H-1B program to grant temporary admission (up to six years) to immigrants in "specialty occupations."[1] These occupations require a college degree and the H-1B workers typically cluster in science, engineering, or computer-related jobs. The annual number of H-1B visas available to for-profit firms is legislatively capped at 85,000 visas for new workers.[2]

The claim that H-1B workers generate beneficial spillovers is used to argue for the expansion of the program. Testifying before Congress, Bill Gates claimed that: "Microsoft has found that for every H-1B hire we make, we add on average four additional employees to support them in various capacities" (U.S. House of Representatives, 2008, p. 19).

Beginning with Kerr and Lincoln (2010), many academic studies test the conjecture that the H-1B program produce such spillovers. The Kerr-Lincoln study noted that H-1B workers cluster in a small number of locations (such as San Francisco or New York), and found that increases in the H-1B cap increased patenting in those cities. Other studies have used the Kerr-Lincoln cross-market methodology and find innovation effects of the program (see Peri, Shih, and Sparber, 2020; and the related work of Hunt and Gauthier-

[1] The United States has other programs aimed at high-skill workers. For example, the O-1 visa program selects persons with "extraordinary ability" in the sciences, business, or athletics. There are also permanent employment-based visas, many of which require advanced education.

[2] The number of H-1B visas granted to non-profit institutions (such as universities, school districts, and medical centers) is not capped, but it is a far smaller program (about 25,000 new visas annually); See https://www.govinfo.gov/content/pkg/FR-2025-12-29/pdf/2025-23853.pdf, p. 60884.

Loiselle, 2010). Note, however, that the settlement of H-1B workers in specific markets is not random, making it difficult to find a convincing instrument.

The literature has since shifted to a firm-based experimental approach. Because the number of H-1B visas is capped and there is substantial excess demand, the Department of Homeland Security (DHS) runs a lottery to allocate the 85,000 visas. On average, 450,000 workers participated in the annual lotteries between 2021 and 2026 (U.S. Citizenship and Immigration Services, 2026). The studies then compare the rate of innovation in firms that won the lottery with the rate in firms that lost. The pioneering analysis of Doran, Gelber, and Ilsen (2022) found no evidence of a spillover effect, although more recent studies reach conflicting results (Dimmock, Huang, and Weisbenner, 2021; and Mahajan et al, 2024).[3]

The H-1B program creates a temporary "marriage" between the firm and the worker. A *specific* firm petitions for the temporary employment of a *specific* worker. Although the mobility of this worker to other firms is not prohibited, the worker must find a new job *and* the new firm must again petition for the temporary employment of this person. The most recent data indicates that 63,865 H-1B workers (out of a population of 680,000) switched jobs in FY2024, for an annual separation rate of 9.4 percent.[4] The separation rate for comparable high-educated workers is between 20 and 25 percent.[5] The additional obstacles that H-1B workers encounter in switching jobs may give the firm some market power, which likely reduces their wage. Noncompete agreements (NCAs), a related

---

[3] In addition to the debate over the productivity effects of the H-1B program, there is concern over adverse employment effects on native workers (Bound, Khanna, and Morales, 2019) and abuse of the program by some employers (Ontiveros, 2017; and Hira and Costa, 2021),

[4] These statistics include cap-exempt H-1Bs. The FY2024 number of H-1B job separations is reported in U.S. Citizenship and Immigration Services, *Characteristics of H-1B Specialty Occupation Workers: Fiscal Year 2024 Annual Report to Congress,* 2024, Table 2. The last DHS estimate of the H-1B population was 583,000 in 2019 (when H-1Bs made up 40 percent of 1.46 million temporary workers). The temporary worker population grew to 1.7 million by 2024. Applying the 40 percent H-1B share yields an estimate of 680,000 H-1Bs in 2024; see U.S. Citizenship and Immigration Services, *H-1B Authorized to Work Population Estimate*, 2019, Table 2; and Office of Homeland Security Statistics, *Population Estimates for Nonimmigrants Residing in the United States: Fiscal Years 2019 to 2024*, 2025, Table 1.

[5] The monthly separation rate for workers with at least a college degree in the CPS is 2.1 percent (Kochhar, Parker, and Igielnik. 2022, p. 9). The Job Openings and Labor Turnover (JOLT) data reports a monthly rate of 2.7 percent for workers in the information industry that employs the bulk of H-1Bs (U.S. Bureau of Labor Statistics, *Job Openings and Labor Turnover Survey,* November 2025, Table 10).

kind of contractual restrictions on labor mobility, reduce the wage by between 4 and 14 percent (Johnson, Lavetti, and Lipsitz, 2025).

Very few studies document the wage gap between H-1B workers and comparable Americans because census-type surveys do not provide any information on the type of visa used by the foreign-born to work in the United States. A rare exception is the work of Bourveau et al (2025), which uses payroll data from a Big 4 accounting firm and finds that new H-1B workers earn 10 percent less than comparable natives.[6]

This paper estimates the wage gap between H-1B workers and comparable American workers. It also examines the implications of the gap for policy changes (such as a visa fee) that can be adopted to redistribute the payroll savings now enjoyed by lottery-winning firms. The analysis uses (publicly available) data from three sources for the 2021-2024 period: the Labor Condition Application (LCA) filed by the firm to attest that their request to fill temporary positions under the H-1B program will not adversely affect conditions for other workers; the I-129 filings where a lottery-winning firm identifies the actual H-1B worker they propose to hire, *reports their salary,* and other characteristics such as gender, education, and age; and the American Community Surveys (ACS), used to construct a comparable sample of native workers. Because of data constraints, the analysis focuses on the capped H-1B visas given to for-profit firms.

The evidence documents a substantial wage gap between H-1B workers and comparable salaried Americans working in the private sector. The average H-1B worker earns about 15 percent less than an American worker with the same education, age, and gender, and who works in the same occupation, industry, and metropolitan area. Since the average salary of the comparable native workers exceeds $125,000 (in 2025 dollars), the average payroll savings accruing to a firm that wins the H-1B lottery are large: exceeding $100,000 over the six-year visa term.

These savings suggest that employers might be willing to "buy" a visa for a specific worker. Such a fee was, in fact, introduced in 2025. Beginning in FY2027, winners of future lotteries must pay a one-time $100,000 visa fee. There are, however, numerous paths that

[6] The other studies include an unpublished working paper by Lofstrom and Hayes (2011) estimating that, on average, H-1B workers get paid more; and an Economic Policy Institute report by Costa and Hira (2020) showing that H-1B workers are paid 20 to 40 percent less.

firms can use to avoid the payment. The fee typically applies when hiring new H-1Bs who are outside the United States. Petitions requesting a change to H-1B status for individuals already in the country (e.g., foreign students) are exempt from the payment.[7]

The paper combines the data on the wage distribution of the H-1B workforce with a model of the hiring decision to determine the impact of such fees on employer demand, and to calculate the size of the fee that would maximize government revenue under alternative assumptions about the unobserved productivity of an H-1B worker.[8] The model exploits the theoretical insight that the unobserved efficiency gain or cost associated with an H-1B hire must be less than the payroll savings produced by that hire. After all, if the unobserved cost exceeded the payroll savings, the H-1B worker would not have been hired in the first place and would not appear in the sample.

The large wage gap between H-1B workers and comparable Americans, combined with the excess demand for the visas, implies that imposing fees even exceeding $100,000 may not change the demand for H-1B workers all that much. The fee, however, will generate substantial revenue, with a lower bound between $5 and $10 billion. It will also change the skill composition of the H-1B workforce, making it more skilled.

The paper is structured as follows. Section II introduces the data that allows the measurement of the H-1B wage gap. Section III estimates the gap both on aggregate and for each of the 25 largest employers of H-1B workers. Section IV discusses measurement issues that may contaminate the estimated wage gap. These issues include the sensitivity of the results to the survey chosen to construct the native baseline (ACS, CPS, or SIPP); the "job seniority bias" introduced by comparing the earnings of newly hired H-1Bs with those of the typical native; and the robustness of the estimated wage gap when the analysis adopts the alternative approach of identifying "likely H-1Bs" in survey data. Section V introduces

[7] See https://www.whitehouse.gov/presidential-actions/2025/09/restriction-on-entry-of-certain-nonimmigrant-workers; and Caroline Tang, Philip K. Sholts, and Maurisa Iacono, "USCIS Issues Additional Guidance on the Proclamation Imposing $100,000 Payment for H-1B Petitions," Ogletree Deakins, October 24, 2025; see https://ogletree.com/insights-resources/blog-posts/uscis-issues-additional-guidance-on-the-proclamation-imposing-100000-payment-for-h-1b-petitions.

[8] The empirical analysis will examine the impact of a "loophole-free" fee system, where all new hires trigger the $100,000 fee. In effect, it identifies the amount that employers are willing to pay and how such a payment would change total demand for H-1B workers by for-profit firms.

the labor demand model used to predict how the imposition of a visa fee affects the hiring of H-1B workers, and Section VI reports the simulation results under various scenarios. The scenarios include the possibility that H-1Bs experience wage growth during the six-year visa term and that employers incur costs when H-1Bs move to other firms.

II. Data

The employer's choice between hiring an H-1B worker or a comparable U.S.-born worker obviously depends on the wage gap between the two types of workers. Holding other things constant, employer demand for H-1Bs would vanish if comparable native workers were cheaper than the immigrants. There is excess demand for the capped number of visas available to for-profit firms. This excess demand suggests that the foreign-born workers earn less than comparable natives and/or that they are more productive than natives with the same age, education, occupation, industry, etc.

An important first step in any study of the economic impact of the H-1B program, therefore, is to estimate the wage gap between the two groups. The analysis reported in this paper merges micro data from three distinct sources to directly estimate the wage gap. A description of these data files follows.

A firm that wishes to hire H-1B workers files a *Labor Condition Application (LCA) for Nonimmigrant Workers* with the Department of Labor (DOL). In the LCA, the firm attests that "the employment of H-1B…nonimmigrant workers in the named occupation will not adversely affect the working conditions of similarly employed U.S. workers."[9] If a firm wishes to hire, say, 15 software programmers through the H-1B program, the firm files a single LCA application to cover all these positions. This LCA is given a unique case number that can be used to track the application through the various stages. The LCA indicates if the positions are for full-time employment and reports the occupation of the positions to be filled at the level of an 8-digit Standard Occupational Classification (SOC) code.[10]

---

[9] See U.S. Department of Labor, "Labor Condition Application for H-1B, H-1B1 and E-3 Nonimmigrant Workers Form ETA-9035CP –General Instructions for the 9035 & 9035E." https://www.dol.gov/sites/dolgov/files/ETA/oflc/pdfs/ETA_Form_9035CP.pdf.

[10] The LCA also requires that the firm classify the position into one of four prevailing wage levels, where the prevailing wage is "the arithmetic mean…of the wages of workers similarly employed in the area of intended employment"'; see "Determination of prevailing wage for labor certification purposes," available at

The second data file used in the analysis contains the information in Form I-129, the *Petition for a Nonimmigrant Worker*, which the firm files with DHS after it has won a slot in the H-1B lottery.[11] Unlike the LCA, the I-129 is an individual-level form: a lottery-winning firm petitions for the temporary employment of a *specific* foreign national. The I-129 names the proposed worker, and provides such identifying information as gender, year and country of birth, educational attainment, and the geographic location of the worksite. The instructions to the I-129 form specifically require the employer to report the "salary or wages paid to the beneficiary," and that request is legally binding.[12] Finally, the I-129 reports the case number that DOL gave to the associated LCA form.

The study uses data from I-129s filed between FY2021 and FY2024 by firms subject to the 85,000 annual cap. We merge these data with the information in the LCAs filed between FY2017 and FY2024 (an LCA is valid for up to three years). Note that the sample consists of *new* H-1B workers hired during the period (as the I-129 filings only include lottery winners). We restrict the analysis to the subsample of I-129 petitions that were for full-time positions; were approved by DHS (over 97 percent are approved); and were for persons aged 21-50 at the time of the filing (representing over 99 percent of the sample).

The LCA data is publicly available.[13] The I-129 forms filed by for-profit firms between FY2021 and FY2024 are also publicly available, making the empirical analysis reported below reproducible. Bloomberg News, through a Freedom of Information Act (FOIA) request, obtained these files and posted them in a public web archive.[14] To summarize, the H-1B worker's education, age, gender, earnings, worksite zip code, and the

---

https://www.ecfr.gov/current/title-20/section-656.40. Although the policy discussion uses these levels to describe the skill composition of the H-1B workforce, the analysis below adopts a more standard definition of skills using the market value of the embodied human capital of H-1B workers.

[11] The form is available at: https://www.uscis.gov/sites/default/files/document/forms/i-129.pdf.

[12] The United States Citizen and Immigration Services (USCIS) has a regulation stating that its form instructions have the force and effect of law. Section 103, 8 CFR 103.2(a)(1) states: "Every form, benefit request, or other document must be submitted to DHS and executed in accordance with the form instructions."

[13] The LCA data are available at: https://www.dol.gov/agencies/eta/foreign-labor/performance.

[14] The Bloomberg files contain "Individual-beneficiary-level data from all H-1B registrations and I-129 petitions" and are available at https://github.com/BloombergGraphics/2024-h1b-immigration-data. The analogous data for cap-exempt workers are not publicly available.

employer's Federal Employer Identification Number (FEIN) are drawn from the I-129 filings; the full-time employment status and SOC code are drawn from the LCA.

Finally, the 2021-2024 ACS cross-sections provide the sample of "comparable" native workers. To approximate key characteristics of the H-1B workforce, the ACS sample consists of private-sector wage and salary workers, who are aged 21-50, work full-time year-round (i.e., 50 or more weeks a year, and 35 or more hours a week), have at least a college degree, and were born in the United States.[15]

The wage gap between H-1B workers and natives should be measured *at a point in time*. Comparing earnings reported in the I-129 filings and the ACS requires some care, as the two data sources refer to wages paid at different times during a period of high inflation (the CPI grew at an average annual rate of almost 5 percent between 2021 and 2024).

The H-1B lottery is typically held in March prior to the beginning of the fiscal year. For example, the FY2024 lottery was held in March 2023, and the winning firms filed I-129s for the beneficiaries shortly thereafter. The form reports the wage that will be paid to the H-1B beneficiary once employment starts. Although the I-129 datafile reports the date when DHS approved the H-1B status of the beneficiary, it does not report the actual *employment start date*. However, it is unlawful for employment to begin before the later of the status approval date and the beginning of the federal fiscal year (October 1, 2023). Even with expedited approval and no delays in the process, *at most* 25 percent of the offered salary could have been paid in calendar year 2023.[16]

Not surprisingly, there may be considerable delays. Over 40 percent of H-1B workers who obtained their visa at a consular post abroad arrived in the United States *at least six months* after the later of the requested employment start date and the petition approval date (USCIS, 2023, Table 9). These data suggest that, in fact, *at most* 15 percent of the wage offer was paid in calendar year 2023.[17]

---

[15] More precisely, the worker is not a naturalized citizen or a noncitizen.

[16] The timing mismatch between the H-1B wage offers and the actual receipt of wage payments bears some resemblance to the offers made in the job market for academic economists. The job offers are made in January-February of calendar year *t*, but the pay period may not begin until September or October (depending on the institution), so that the bulk of the payments will be made in calendar year *t*+1.

[17] To illustrate, 32,199 of the 83,730 FY2024 lottery winners in the sample have a valid status date on or prior to October 1, 2023, and did not request consular processing. If all started work on October 1, they

I use the beneficiary's status approval date to convert the H-1B wage data into real dollars. Specifically, wages are deflated using the average CPI in the 12-month period after H-1B status was approved and the fiscal year started. To illustrate, some beneficiaries in the FY2024 lottery received status approval on or before October 1, 2023. I assume these workers encountered no further delays and started working on October 1, so that they received three months of salary in calendar year 2023 and another nine months in calendar year 2024. The CPI deflator is the average monthly CPI between October 2023 and September 2024. Similar calculations are done for those who received status approval after October 1 but on or before December 1. Finally, the deflator will be the mean CPI for calendar year 2024 for beneficiaries who received status approval after December 1, 2023.

The ACS wage data has a related timing issue. The ACS samples a new group of households each month, and reported earnings refer to the previous 12 months. About half of the earnings reported in, say, the 2024 ACS were earned in 2023. This data quirk may not matter much in a low-inflation period, but it can distort wage comparisons with H-1B workers between 2021 and 2024. The deflator used for wages in the year t ACS will be the mean of the annual CPI in years t-1 and t.

The deflation procedure described above ensures that *wage data from all sources are expressed in constant dollars at the time the earnings were received.*[18] All dollar values reported below are in 2025 dollars.

had 3 months of 2023 salary. However, 22,029 of the winners have similar valid status dates, but requested consular processing. The DHS data suggests that 42.8 percent of this group had their entry delayed until 2024, so only 57.2 percent of this group earned 3 months of 2023 salary. Repeating the calculations for the lottery winners who entered prior to November 1 (which potentially provides two months of 2023 salary) or December 1 (which potentially provides one month of 2023 salary) results in the 15 percent statistic.

[18] A critique of an early draft of this paper claimed that the wage gap is much smaller than I had estimated (He and Ozimek, 2026). The authors, however, compared the H-1B and ACS data incorrectly. As Ozimek describes (in personal correspondence): "The 2024 fiscal year H-1B data should be merged to 2023 ACS data, and so on for earlier years." This approach, however, ensures that the timing of the earnings of H-1Bs and natives does not match, breaking a cardinal rule in estimating inter-group wage differences. As noted above, at least 85 percent of the H-1B worker's earnings were earned in 2024, and half of the earnings of natives reported in the 2023 ACS were earned in 2023 with the other half in 2022. He and Ozimek treat all this income as being in nominal 2023 dollars, severely biasing the estimate of the wage gap.

Table 1 reports summary statistics. Note that H-1B workers are more likely to be male, younger, and better educated.[19] Over 40 percent of the H-1B workforce has at least a master's degree (as compared to a quarter of the native workforce). The H-1Bs earn $110,000, and the salary of comparable high-skill natives working in the private sector is even higher (about $125,000).

Salary differences will likely arise because of differences in metropolitan area of employment, occupation, and industry.[20] Over 40 percent of the H-1B workforce is in five high-wage metropolitan areas (New York, Dallas, San Jose, Seattle, and San Francisco). In contrast, only 15.1 percent of natives work in those five localities. There is even more concentration in the labor market. The five largest occupations are in the high-tech sector (including Software Developers and Computer Systems Analysts) and account for 63.8 percent of total H-1B employment (but only 7.8 percent of high-skill natives work in those jobs). Similarly, the five largest industries are in the high-tech or science sectors and employ 65.3 of H-1B workers (but only 15.7 percent of the native workforce). In fact, the industrial concentration of H-1Bs is striking, with nearly half of the workforce employed in a single industry (Computer Systems Design).

III. Estimates of the Wage Gap

The analysis pools the merged LCA/I-129 data with the 2021-2024 ACS to estimate standard log wage regressions where the wage of worker i (w_i) is determined by a vector of skill characteristics (X_i), and fixed effects specifying the worker's metropolitan area of employment (m_i), industry (d_i), and year (t_i). The regression model also includes a 0-1 variable indicating if the worker is an H-1B visa recipient (H_i):[21]

---

[19] About 17 percent of the I-129 filings do not report the educational attainment of the H-1B beneficiary. I classified those workers as "college graduates" because that is the typical minimum education requirement for the visa. As will be noted below, the estimated wage gaps are practically identical if the observations with missing education information are simply excluded from the analysis.

[20] I use publicly available crosswalks to link the variables in the H-1B data file and the ACS. The Appendix summarizes the construction of the crosswalks. The metropolitan area fixed effects in the regressions reported below indicate the metropolitan area of employment, and the occupation and industry fixed effects correspond to the census occupation and industry classifications.

[21] The analysis excludes observations with outlying wage data in either the I-129 filings or the ACS. Specifically, both natives and H-1B workers who reported full-time annual earnings under $34,700 are

$$\log w_i = X_i\beta + \gamma H_i + m_i + d_i + t_i + \epsilon_i. \qquad (1)$$

The variables in X include education, age, gender, and occupation fixed effects. The year fixed effects are defined so that year t indicates that the observation was drawn from either the fiscal year t H-1B data or the calendar year t ACS.[22] The observations are weighted using the ACS sampling weight for native workers and a weight set equal to one for the H-1B workers (since the H-1B sample represents the universe of the H-1B workforce).

Panel A of Table 2 reports the adjusted log wage gap. The various columns of the table present alternative specifications of the regression model. Consider row 1 of Panel A, which reports the generic OLS estimates. The raw gap in column 1 indicates that H-1B workers, on average, earn about 4 percent more than natives. Column 2 shows that the large H-1B log wage advantage vanishes once the regression simply controls for differences in the geographic location of the two groups. Further, a wage disadvantage of nearly 14 percent appears after the regression controls for skill differences between the two groups (i.e., education, age, gender, and occupation).

There also exist interindustry wage differences that may be unrelated to skills (Krueger and Summers, 1988; and Card, Rothstein, and Yi, 2024). The addition of the industry fixed effects in column 5 increases the wage gap to 15.5 percent. In short, a standard regression analysis that adjusts for differences in relevant characteristics leads to a 20-point reversal of the wage gap: from a +4 .4 percentage point advantage for H-1B workers to a -15.5 percentage point disadvantage.[23]

The average log wage gap may give a distorted impression of the actual wage disadvantage because the concentration of H-1B workers in specific sectors of the labor

---

excluded; and H-1B workers with earnings in the top 0.05 percent of the distribution (i.e., earnings exceeding $1.29 million) are also excluded. The annual earnings data in the ACS is top coded by the Census Bureau.

[22] Since all earnings have been converted to 2025 dollars, excluding the year fixed effects from the regression model barely changes the results.

[23] As noted earlier, 17 percent of the I-129s do not report the education of the beneficiary, and these workers are classified as "college graduates" in the analysis. The Clemens (2026) replication of results reported in an earlier draft of this paper suggests that the results are sensitive to this assumption. In fact, the adjusted wage gaps reported in Table 2 are practically identical if the affected observations are simply excluded from the analysis. The wage gap in the fully specified model is -0.165 (0.003).

market could produce a wage distribution that has a very different shape than that of natives. The summary statistics in Table 1, in fact, show that the direction of the raw wage gap depends on whether earnings are measured in dollars or logs. The second row of the table reproduces the analysis using quantile regressions to estimate the difference in the median log wage between the two groups. The results are similar: An unadjusted +7.2 percentage point advantage in the median log wage turns into a -14.7 percentage point disadvantage after including the covariates.

It is evident that the sample of U.S.-born salaried college graduates aged 21-50 used as the baseline group differs in important ways from the H-1B workforce, so that the estimated wage gaps might change substantially if the baseline sample more closely resembled the H-1B population. It is easy to determine what the H-1B wage gap would look like if the native workforce had a similar distribution of key socioeconomic characteristics as the H-1B workforce, such as geography, occupation, or industry. This alternative estimation method essentially reweights the native sample using, for example, the geographic distribution of the H-1B sample so that the distribution of the two groups would be identical.

To illustrate, let β_j be the share of the H-1B workforce in metropolitan area *j* and let θ_{ij} be the ACS sampling weight of native person *i* who works in metropolitan area *j*. The sampling weight for natives in the reweighted sample is given by:

$$\omega_{ij} = \beta_j \theta_{ij} \frac{\sum_i \theta_{ij}}{\sum_i \beta_j \theta_{ij}}, \tag{2}$$

where the denominator in equation (2) ensures that the sum of the reweighted native population equals the original sum of the sampling weights in the ACS native sample.

Panel B of Table 2 shows the estimated wage gaps when the native population is reweighted so that the metropolitan area distribution of natives is the same as that of H-1B workers; and Panel C conducts the parallel analyses that equalizes the occupation-industry distributions. The first column shows that using the baseline group of native workers reweighted to more closely resemble the H-1B workforce is sufficient to turn the unadjusted 4.4 percent wage advantage into a -9.9 percentage point disadvantage when the geographic distributions are equalized, and into a -24.8 point disadvantage when the occupation and industry distributions are equalized. After controlling for all other covariates, column 5 shows that the estimated wage gap is -17 percent. In short, the construction of "better" native baseline groups reinforces the conclusion that H-1B workers earn far less than comparable native workers.

Wage gaps at the firm level

The I-129 petition gives detailed information about the employer, including the name of the firm and the Federal Employer Identification Number (FEIN). This information makes it possible to estimate equation (1) by replacing the H-1B indicator with a vector H_{if} indicating whether H-1B worker *i* is employed by firm *f*. The coefficients of these fixed effects then give the adjusted wage difference between H-1B workers in each firm and the native baseline.

Table 3 reports the number of I-129 petitions submitted by the 25 firms with the most filings. The table also reports the average annual earnings of H-1B workers and the adjusted wage gap in each of these firms (using the regression specification that includes all covariates). There are large interfirm differences in the average salary of H-1Bs, ranging from about \$170,000 at Meta and Apple to about \$97,000 in Infosys and Tata Consulting Services. Many of the large American high-tech companies (e.g., Google, IBM, and Tesla) have adjusted wage gaps near zero, although others (Amazon.com Services and Meta) pay substantially higher wages to H-1Bs. In contrast, several companies in the Top 25 (bolded in the table) are often identified as outsourcing pipelines for Indian H-1B workers, such as Infosys, Tata Consultancy, Wipro, and HCL (Hira, 2010; and Varma and Rogers, 2020). These outsourcing firms have negative wage gaps, and the gaps are sometimes very large. The wage gap at both Wipro and Tech Mahindra exceeds -35 percent.

Notably, there is only a modest concentration of H-1B workers in the Top 25 firms: Nearly 75 percent of H-1B hires are outside the Top 25. In fact, the data reveal that 46,169 distinct firms (as identified by a unique FEIN) hired at least one H-1B worker. Strikingly, the median firm in the sample hired exactly *one* H-1B worker during the entire 4-year period, and the 75$^{\text{th}}$ percentile firm hired *three*.

The large (and significant) wage gap of -18.0 percent reported for "all other firms" then suggests that the low average pay of H-1Bs is not simply due to the large outsourcing firms. Estimating equation (1) in the subsample of firms that hired only one H-1B worker yields a log wage gap of -0.197 (0.003). A similar regression in the subsample of firms that hired at most three yields a gap of -0.192 (0.002).

In short, practically all H-1B workers (except the few that end up in the largest American-owned high-tech companies) end up working for firms that pay them far less than the market wage for statistically comparable American workers.

IV. Robustness and Measurement Issues

The merging of the H-1B wage data in the I-129s with the native wage data in the ACS introduces several measurement problems. I have already noted the difficulties created by using annual earnings measured at different times, and the importance of carefully deflating these data (particularly in a period of high inflation). This section addresses other data concerns to establish the robustness of the results and provide a better interpretation of the evidence. First, I exploit the ACS data in a way that completely bypasses the timing mismatch issue. Second, I compare the ACS results to those obtained when the native sample is drawn from the CPS-ASEC or the SIPP. Finally, I estimate the magnitude of a potentially important bias. The I-129 filings give the *starting* wage in a job while the native salary in the ACS may reflect the returns to many years of job seniority.

A. Comparisons with the ASEC and the SIPP

A complementary robustness check uses alternative surveys to construct the native baseline.[24] The obvious alternative is the Current Population Survey's Annual Social and Economic Supplement (ASEC). One advantage of the ASEC is that annual earnings refer to

[24] The native samples are roughly similar across surveys. The person is U.S. born, aged 21-50, has at least a college degree, works in a private sector firm, and earns at last $34,700 annually. In the ASEC, the person works at least 50 weeks a year and 35 hours weekly. In the SIPP, the person worked every month in the reference year, worked at least 35 hours weekly in the reference month in the main job, and has valid earnings for the main job in each month of the reference year. The ASEC only reports the metropolitan area of residence (not of employment), and the SIPP does not report detailed metropolitan area information at all.

the calendar year prior to the survey (so there is no overlapping-years deflator issue as in the ACS). The exercise uses the 2022-2025 ASEC files, which report annual earnings for calendar years 2021-2024. The ASEC earnings are deflated using the mean CPI for the corresponding calendar year. Table 4 reports the adjusted wage gaps estimated after merging the I-129 data with the native baseline in each of the surveys. The ASEC analysis, in row 2, reveals a wage gap of -15.5 percent, identical to that obtained in the ACS.

Another advantage of using the ASEC is that the data can be merged with the CPS Basic monthly files for a quarter of the sample. The monthly files report whether the respondent worked in more than one job in the last week. The merge enables an evaluation of another measurement problem: the I-129 wage data refers to a single job and the ASEC wage data for the native baseline includes earnings from all jobs.

The wage gap in the smaller merged sample is somewhat higher (almost -20 percent) than the one obtained using the full ASEC sample. Row 4 estimates the model using native workers who worked in *only one job* in all the monthly interviews in the calendar year. The sample size declines further because 8.3 percent of natives reported working in more than one job in at least one of the interviews during the calendar year. The estimated wage gap, however, barely changes. In short, the evidence does not support the conjecture that multiple jobholding by natives exaggerates the H-1B wage gap.

Finally, I use the 2022-2024 waves of the Survey of Income and Program Participation (SIPP) to construct the native baseline. The SIPP does not report annual earnings. Instead, it reports monthly earnings in the "reference year" (i.e., the year before the interview year). For example, persons interviewed in the 2024 SIPP are asked to (retrospectively) report earnings for each month in 2023. The SIPP wage data is deflated using the mean CPI for the reference year.

As row 5 shows, the wage gap of -0.001 (0.042) in the SIPP differs dramatically from that of the ACS and the CPS. This is not surprising to anyone familiar with the literature on income measurement in the SIPP. Meyer, Mok, and Sullivan (2015, p. 203) report that "wage and salary income are close to administrative totals in the CPS but substantially lower in the SIPP." The underestimation of wage and salary income is large, between 11 and 15 percent.[25] Ironically, the absence of a wage gap in the SIPP suggests that the actual wage gap may be sizable, on the order of 11 to 15 percent.

B. The job seniority bias

The H-1B wage offer is for the first year on the job and it is being compared to the average wage of natives, many of whom have substantial job seniority. This comparison may exaggerate the wage disadvantage of H-1B workers. Unfortunately, few data sources can be used to avoid the bias. Although the SIPP contains the relevant information on native job tenure, the survey does not correctly measure native earnings (and the sample of native workers who just started the job is very small, fewer than 100 persons).

However, it is easy to calculate a back-of-the-envelope estimate of the bias. Let $\log \overline{w}_h$ represent the mean (adjusted) wage of H-1B workers and $\log \overline{w}_n$ represent the mean (adjusted) wage of natives. By construction, the mean wage of the H-1B workforce is composed only of brand-new workers, while the mean wage of natives is composed of two groups, brand-new workers and workers with more seniority. Let θ_0 be the share of natives who are brand new hires and θ_1 be the share with more seniority. The mean log wage of natives can then be written as $\log \overline{w}_n = \theta_0 \log \overline{w}_{n0} + \theta_1 \log \overline{w}_{n1}$. Finally, let $\Delta = \overline{w}_{n1} - \overline{w}_{n0}$ be the (positive) seniority wage premium, the wage advantage enjoyed by native workers with more seniority.

The wage gap reported in Table 2 is the difference $\log \overline{w}_h - \log \overline{w}_n$. The correct measure of the gap, however, should be $\log \overline{w}_h - \log \overline{w}_{n0}$. It is easy to show that:

$$(\log \overline{w}_h - \log \overline{w}_{n0}) = (\log \overline{w}_h - \log \overline{w}_n) + \theta_1 \Delta. \tag{3}$$

[25] Czakja and Denmead (2012, p. 5) concludes that "wage and salary earnings in the ACS were slightly lower than in the CPS ASEC, but SIPP was 15 percent lower." Similarly, Citro and Scholz (2009, pp. 127-128) note: "SIPP captures nearly as much transfer income and substantially more self-employment income but less wage and salary income…As a result, SIPP underestimates total CPS income by 11 percent".

The last term in equation (3) is the positive job seniority bias. Note it is possible to retrieve the "true" wage gap from the observed gap if one knows the fraction of the workforce that is newly hired (θ_1) and the value of the seniority wage premium (Δ).

The premium can be estimated using the CPS Job Tenure Supplement, conducted every two years (2022 and 2024). The job tenure questions are only asked of persons in the Outgoing Rotation Group (ORG). Although the timing of the supplement does not permit a merge of the tenure data with the ASEC earnings data, it is possible to merge the tenure data with the ORG earnings data. The rotation sampling of the CPS permits a merge only with the monthly samples between January and April. The analysis is further restricted to ORG observations in 2022 and 2024, as those are the observations for which the reported value of job tenure potentially corresponds with reported weekly earnings.

Let S_i be a binary variable indicating if the worker reported more than 1 year of seniority. The seniority wage premium is given by:[26]

$$\log w_i = \underset{(0.014)}{0.118}\, S_i + t_i, \tag{4a}$$

$$\log w_i = \underset{(0.014)}{0.037}\, S_i + t_i + \text{controls}, \tag{4b}$$

Equation ($4a$) shows that workers with more than one year of seniority earn 12 percent more than newly hired workers in a regression that only controls for year fixed effects.[27] The share θ_1 in the data is 78.7 percent. The seniority bias, therefore, could be sizable. However, equation ($4b$) shows that much of the premium vanishes after adding the covariates (age, education, gender, occupation, industry, and metropolitan area fixed effects). As a result, the bias implied by equation (3) is small, about 2.9 percentage points

[26] The ORG sample consists of workers who are U.S. born, aged 21-50, have at least a college degree, and work in a private sector firm. The ORG does not report full-time, year-round work status, so I limit the analysis to natives who worked in the reference week and who usually worked at least 35 hours weekly in the main job. I exclude workers with weekly wages below the 5th percentile (or $677). If the person worked year-round this would imply an annual earnings filter of about $35,000, which is close to the $34,700 filter used throughout the analysis. The regressions have 8,273 observations.

[27] The job tenure information is collected in February. In principle, some workers in the March and April samples could have switched jobs after the interview. I estimated the regression using only the January and February data. The adjusted seniority wage premium is 0.020 (0.020).

(or 0.787 × 0.037). The ACS wage gap in Table 2 was 15.5 percent. Adjusting for the seniority bias implies a "true" wage gap of 12.6 percent.

The small seniority bias is consistent with related estimates in the literature (Altonji and Shakotko, 1987; Altonji and Williams, 2005), which suggest that the return to job tenure is less than one percent per year after controlling for worker heterogeneity.[28] In fact, a recent study of the sources of wage growth concludes that the "returns to firm tenure…are close to zero" (Adda and Dustmann, 2023, p. 486). The small 2.9 percentage point bias adjustment is used below when the analysis simulates what happens to labor demand after a visa fee is imposed.

C. "Likely H-1Bs" in the ACS

Many recent studies examine outcomes of undocumented immigrants in survey data by imputing "likely undocumented" status using various demographic characteristics (Borjas, 2017; Castillo, Hill, and Hertz, 2024). An analogous exercise would identify "likely H-1Bs." This approach gives an alternative ballpark estimate of the wage gap that entirely avoids the timing mismatch between the I-129 filings and the ACS data, and that can serve as an intuitive prior for the magnitude of the wage gap.

The summary statistics in Table 1 showed that H-1B workers concentrate in a small number of industries and occupations. I exploit this clustering to impute likely H-1B status. Specifically, a likely H-1B is a noncitizen, who migrated to the United States after age 18, who has been in the country fewer than 6 years, and who works in one of the top 5 occupations *or* top 5 industries employing H-1Bs.

This exercise yields a likely H-1Bs workforce that resembles the actual H-1B workforce along two important dimensions. The top five metropolitan areas where likely H-1Bs work are the same top five areas where actual H-1Bs work (accounting for 44.8 percent of likely H-1Bs and 43.9 percent of actual H-1Bs). Similarly, the fraction of likely H-

[28] In fact, the 3.7 percent estimate in equation (4*b*) is almost identical to what the results in the Altonji-Shakotko study would predict (about 0.6 percent wage growth per year of seniority). The average worker with more than one year of seniority has been on the job 6.7 years. If each year on the job raises wages by 0.6 percent, the job seniority premium would be 4.0 percent.

1Bs born in India or China is disproportionately large (62.5 percent as compared to 82.1 percent for actual H-1Bs).

I estimate the earnings function in (1) using the sample of native workers and likely H-1Bs in the pooled 2021-2024 ACS, where the key regressor is the variable indicating if the person is a likely H-1B worker. The regression excludes likely H-1Bs who arrived in the United States the same calendar year as the ACS cross-section (as their observed earnings cannot capture a full year's salary). Table 5 reports an adjusted log wage gap of -8.1 percent between natives and the likely H-1B workforce. Column 2 allows the gap to depend on how many years the worker has been in the United States. The wage gap is almost 15 percent for likely H-1Bs who have been in the country one year and falls to 2 percent by the end of the visa term.

Note, however, that the annual earnings of likely H-1Bs with one year in the United States are also measured with error because the ACS is a monthly survey that reports income over the past 12 months (e.g., annual earnings would be measured incorrectly if the likely H-1B migrated in November 2023 and was interviewed by the ACS in February 2024). The estimate that reflects a *full* year's earnings lies between the wage gaps for workers with one or two years in the country, or about 12.5 percent. This exercise, therefore, estimates wage gaps for brand new H-1B workers that are close to those obtained using administrative data. Note also that there is substantial wage growth over the 6-year visa term, implying a (relative) wage growth rate of about 1.5 percent a year.

The last two columns of Table 5 replicate the analysis using a stricter filter to define likely H-1B status. The likely H-1B workforce is now composed of workers who work in one of the top 5 occupations *and* in one of the top 5 industries (in addition to being noncitizens who migrated after age 18 and have been in the country fewer than 6 years). The stricter definition leads to even larger estimated wage gaps.[29]

V. Visa Fees and Labor Demand

---

[29] The definition used in columns 1 and 2 predicts a population of likely H-1Bs of about 310,000, while the stricter definition predicts a population of about 105,000. The steady state population of actual H-1Bs should be around 500,000 (or 85,000 annual visas times the six-year visa term).

A specific employer must file Form I-129 to hire a specific foreign worker through the H-1B program. The issuance of a visa then tends to create an employment relationship that can last up to six years (with renewal), perhaps giving the employer some market power and likely reducing the relative wage of the H-1B workforce. It is also sometimes argued that H-1B workers improve productivity in the firms that hire them (Chen, Hshieh, and Zhang. 2021; Dimmock, Huang, and Weisbenner, 2022; Mahajan et al, 2024), further increasing the firm's profitability.

The lower payroll costs and the potential productivity gains suggest that many employers might be willing to "buy" an H-1B visa for a particular worker. In fact, beginning with the FY2027 lottery, firms will be required to pay a fee of $100,000 at the time the visa is issued (although there are exemptions that firms may exploit to avoid paying the fee). I now examine the data on the wage distribution of the H-1B workforce through the lens provided by a simple economic model of the hiring decision to estimate the potential impact of a fee on employer demand, and to calculate the size of the fee that would maximize government revenue.[30] The analysis ignores the potential loopholes and simply derives the labor demand consequences if firms pay the fee for every new H-1B hire.

Let w_h be the annual wage the employer offers H-1B worker h and assume initially that the firm hires the worker for the full six-year visa term at this constant wage. Let F be a *one-time* fee charged to the employer when first awarded the visa for that worker. Let π_h be a random variable, observed to the employer but unobserved to the analyst, that captures the productivity gain or additional cost associated with an H-1B hire relative to a native hire. Phrased differently, the variable π_h gives the unobserved "cost differential" of an H-1B hire. The differential may be negative if the H-1B worker brings complementary skills into the production process or if they reduce turnover costs for the firm. It may be positive because an H-1B hire might introduce additional costs, including legal fees or production inefficiencies created by language barriers and acculturation issues within the

[30] One alternative to fees would be to auction off the available H-1B visas. In the U.S. context, however, this (perhaps more efficient) alternative is difficult to implement as it would require new legislation to set up the auction system. The fee has the political advantage that it can perhaps be imposed within the context of existing legislation.

firm. Finally, let w_n be the annual wage the employer must pay a comparable U.S.-born worker (also assumed constant over the six-year period).

For convenience, I scale the cost differential π_h so that it can be interpreted as a fraction of the H-1B worker's wage. The true cost of hiring an H-1B worker is $w_h(1+\pi_h)$. The employer hires an H-1B worker over a comparable American if:

$$w_h(1+\pi_h)R + F \leq w_n R, \tag{5}$$

where R is the discount factor used to add up the payroll outlays over the six years ($R = \sum_{t=0}^{5} 1/(1+r)^t$). The inequality in equation (6) simply states that the employer hires the H-1B worker if the "true" cost of hiring that worker (i.e., including the unobserved cost differential) is lower than the cost of hiring a comparable American.

Because empirical studies of earnings determination typically use log wage regressions, it is useful to convert the firm's hiring decision rule into log terms:

$$\log w_h + \log(1+\pi_h) + \log\left(1 + \frac{F}{w_h(1+\pi_h)R}\right) \leq \log w_n\,. \tag{6}$$

Consider the hiring decision in the absence of a fee (as was the case in the FY2021-FY2024 period covered by the data). If the employer hired worker h during that period, it must have been the case that:

$$\pi_h \leq \log w_n - \log w_h = \Delta w_{nh}, \tag{7}$$

using the approximation that $\log(1+\pi_h) \approx \pi_h$. The evidence indicates that, on average, Δw_{nh} is positive, as hiring a native worker is more costly than hiring an equivalent H-1B worker. To simplify the exposition, the variable Δw_{nh} will be called the "payroll savings" accruing to the firm from the hire of worker h.

Equation (7) shows that for an H-1B worker to have been hired in the absence of a fee it must have been the case that the unobserved cost differential π_h was smaller than the payroll savings. This inequality obviously holds if π_h is negative, or when H-1B workers introduce unobserved productivity gains into the firm. The inequality might also hold if π_h is positive, or when there are unobserved costs associated with the hire. Equation (7) then implies that the H-1B worker would still have been hired if the unobserved cost increase is smaller than the payroll savings (in percentage terms).

The empirical exercise simulates data from actual H-1B hires in the FY2021-FY2024 period, when the inequality in equation (8) *must* hold, to infer if the employer would still hire the specific foreign worker after the introduction of a one-time fee of *F* dollars. The simulation assumes that $\pi_h \sim N(\mu_\pi, \sigma_\pi^2)$. Consider the simplest case where $\mu_\pi = 0$ (although the analysis will also use alternative assumptions). The variance is then uniquely determined by the additional assumption that 99 percent of the values of the random variable π_h lie in the [-0.5, +0.5] interval, so that hiring an H-1B worker will typically not reduce the true hiring cost by more than 50 percent of the worker's wage, or increase it by more than 50 percent. The standard deviation of π_h then equals 0.194.[31]

Note that these distributional assumptions refer to the *population* of potential H-1B job seekers. Equation (7) implies that the distribution of the unobserved random variable π_h in the subsample of workers *actually hired* is a normal distribution truncated from above. The truncation point for H-1B worker *h* is the value of the payroll savings Δw_{nh} associated with that hire.

The simulation requires information on the wage that a native workers comparable to H-1B worker *h* would earn. Consider the following regression model estimated in the sample of *native* workers:

$$\log w_n = X\beta_n + m_n + d_n + t_n + \epsilon_n. \tag{8}$$

The typical Oaxaca-Blinder exercise indicates that the wage that worker *h* would earn if he were native is:

$$\log \widehat{w}_{nh} = X_h \hat{\beta}_n + \widehat{m} + \hat{d} + \hat{t}. \tag{9}$$

[31] The assumption that 99 percent of the area lies in the [-0.5, +0.5] interval implies that the standard deviation is given by: $\sigma_\pi = (\pi_h - \mu_\pi)/2.576 = 0.5/2.576 = .0.194$ if $\mu_\pi = 0$.

where $(\hat{m}, \hat{d}, \hat{t})$ are the predicted geography, industry, and time fixed effects for worker h. The employer will then hire the worker even after the introduction of a fee of F dollars if:

$$\pi_h + log\left(1 + \frac{F}{w_h\, e^{\pi_h} R}\right) \le (\log \widehat{w}_{nh} - \log w_h) = \Delta\widehat{w}_{nh}. \tag{10}$$

Given a specific value of the fee F and the distributional assumptions about π_h, it is straightforward to determine if the inequality in (10) holds for each of the H-1B workers hired in the sample period (when the fee was zero). The hiring rates reported below are averages over 100 replications of the simulation exercise, using a 3 percent rate of discount.

VI. Simulation Results

Figure 1 illustrates the distribution of the estimated payroll savings $\Delta\widehat{w}_{nh}$ for the existing H-1B workforce. The payroll savings in the figure are adjusted for the job seniority bias derived earlier. The numerical exercise showed that the bias increased the measured payroll savings by an average of 2.9 percentage points. I assume that this bias simply shifts the entire distribution of payroll savings by 2.9 percentage points. The bias-adjusted distribution then has a mean of 0.125.[32]

The exercise produces positive payroll savings for 68.2 percent of the workers. For almost a third of the H-1Bs, however, it seems that it would have been cheaper to hire the comparable native worker. Abstracting from sampling variation, the fact that H-1B workers with negative payroll savings were *indeed* hired strikingly illustrates the existence (and importance) of an even more negative unobserved cost differential π_h. After all, in the absence of sizable unobserved productivity gains, these workers should never have been hired in the first place.

[32] Given that many recent studies conclude that the seniority effect on wages is near zero, the assumption of a slight leftward shift in the payroll savings distribution provides the simplest way of addressing the problem. Note also that the mean of $\Delta\widehat{w}_{nh}$ is the log wage gap between natives and H-1B workers implied by a standard Oaxaca-Blinder decomposition, where the coefficients of the earnings function vary between natives and H-1B workers. The gap predicted by this decomposition (before adjusting for the job seniority bias) is 0.154, which is practically identical to the 15.5 percent gap reported in Table 2.

To show how visa fees influence the firm's hiring behavior, I begin with the simplest (but unrealistic) scenario where the *distribution* of the random variable collapses to zero ($\pi_h = 0$)—that is, hiring an H-1B worker *never* introduces a productivity gain and *never* introduces additional costs. The observed data (i.e., the H-1B worker's wage, the predicted wage that a comparable native earns, and the size of the fee) provides all the information required by the employer to make the hiring decision.

As the top panel of Figure 2 shows, only 68 percent of existing H-1B workers (i.e., the subsample of workers with positive payroll savings) satisfy the inequality in equation (8). In the absence of an unobserved cost differential, *none* of the 32 percent of the workers with negative payroll savings would have been hired in the first place (when the fee was zero). Despite these initial conditions, the simulation shows that even with a fee as high as \$100,000, the hiring rate would only fall to 46 percent.

Figure 2 also illustrates the hiring rate in the more realistic scenarios that allow for an unobserved cost differential.[33] The value of the random variable π_h is drawn from a normal distribution truncated (from above) at the payroll savings, $\Delta\widehat{w}_{nh}$. The random draw from this truncated normal ensures that the unobserved cost differential is always smaller than the payroll savings associated with that worker, providing the economic rationale for the hiring of the 32 percent of the H-1B workers with negative payroll savings.

The simulations use three alternative assumptions for the mean of the random variable π_h: -0.1, 0.0, or +0.1.[34] These assumptions allow for the possibilities that the average H-1B worker embodies an unobserved productivity effect that reduces the worker's hiring cost by 10 percent; or that the average H-1B worker neither increases nor decreases the cost of the hire; or that the average H-1B worker introduces an additional cost that raises the cost of hiring by 10 percent.

The simulations obviously predict that all workers are hired when the fee is set to zero and the hiring rate declines as the fee increases. The hiring rates are not very sensitive to alternative assumptions about the mean of the unobserved cost distribution. Consider,

[33] To reduce the influence of outliers in the individual-level Oaxaca-Blinder exercise, the simulations trim the distribution of individual payroll savings by top-coding values at 50 percent (0.4 log points) and bottom-coding them at −50 percent (−0.7 log points).

[34] The various scenarios only shift the mean of the distribution of π_h; the variance is held constant.

for example, the imposition of a $100,000 fee. Between 45 and 64 percent of the H-1Bs hired between 2021 and 2024 would still be hired. One implication of the relative constancy of the hiring rate is that the payroll savings associated with hiring H-1B workers is sufficiently large that shifting the mean of the unobserved cost differential by 20 percentage points (i.e., from -0.1 to +0.1) does little to change the hiring behavior of firms.

The estimated hiring rates illustrated in the top panel of Figure 2 can be used to calculate the total number of H-1B workers who would be hired when firms must pay the fee. The government caps the number of H-1B visas at 85,000 visas per year. There has been substantial excess demand for these visas in the past. On average, almost 450,000 distinct registered beneficiaries participated in the lotteries between 2021 and 2026.

The excess demand plays a crucial role in determining market outcomes once a fee is introduced. Suppose the hiring rate with a fee of, say, $100,000 is 50 percent. In other words, only half of the H-1B workers hired in the past would have been hired if firms had to pay $100,000 for the visa. If the lottery winners are a random sample of the population of lottery registrants, firms would still want to hire half of the workers who lost the lottery. After the imposition of the fee, the only firms that bother registering for the lottery are those willing to pay the fee if they win. If the population of lottery registrants was 450,000, there would be a total of 225,000 lottery registrations for the 85,000 slots and total demand for H-1B workers remains unchanged.

Let p_F be the hiring rate when the fee is F dollars, and let N be the baseline number of lottery registrations. The total number of visas V_F that employers will demand after the imposition of a fee is:

$$V_F = \begin{cases} p_F N, & if\ p_F N < 85{,}000, \\ 85{,}000, & if\ p_F N \geq 85{,}000. \end{cases} \tag{11}$$

The exercise uses three alternative values for the baseline number of registrations: twice the number of capped visas, or 170,000; three times, or 255,000; and four times, or 340,000. The three scenarios reflect “low” excess demand, “moderate” excess demand, and “high” excess demand. It is instructive to discuss the evidence using the low excess demand assumption, as this scenario provides lower bound estimates for the impact of a fee on demand and government revenue.

Panel B of Figure 2 uses equation (11) to calculate the number of visas that will be demanded for alternative values of the fee. Even at the low level of excess demand (below the actual number of registrants in the recent past), firms would still use all 85,000 visas for fees as large as $87,000. If the average H-1B worker embodied a 10 percent productivity advantage, the number of visas demanded would remain at 85,000 even if the fee were as high as $148,000.

The estimated number of visas used provides the data required to calculate the revenue-maximizing fee. The bottom panel of Figure 2 illustrates the revenue curves (i.e., the product of the fee times the number of visas demanded). The revenue-maximizing fee is sizable: $118,000 when the average H-1B worker increases hiring costs by 10 percent; $142,000 when the average worker neither increases nor reduces costs; and $166,000 when the average worker embodies productivity gains that reduce costs by 10 percent. The total revenue collected at the revenue-maximizing fee ranges from $7.8 billion to $12.8 billion annually.

Table 6 summarizes the results of the various simulations, allowing for alternative assumptions about excess demand and the mean of the unobserved cost differential. Practically all 85,000 capped visas are used in either the moderate or high excess demand scenarios, regardless of the mean of the cost differential. Even with hiring rates as low as 25 percent, there would still be a sufficiently large number of lottery losers that would be hired after the imposition of a fee.

Note the high value of the fee in all simulations reported in the table, ranging from $118,000 to $249,000. Similarly, the revenue collected will also be substantial, ranging from $8 billion to over $20 billion.

Finally, a fee will change the skill composition of the H-1B workforce. It is straightforward to use the native wage regression in equation (8) to construct an index based on an H-1B worker's observable skills. Specifically, I predict each H-1B worker's log wage (after "deflating" for geography, industry, and time fixed effects):

$$I_h = X_h \hat{\beta}_n, \tag{12}$$

where the variables in X are education, age, gender, and occupation. The index I_h gives a weighted sum of the H-1B worker's observable skills, where the weights measure how the different characteristics are valued in the labor market. For convenience, I classify H-1B workers into four skill categories based on the quartiles of I_h.

It turns out that high-skill H-1Bs generate the largest payroll savings. The average payroll savings for skill group s is given by:

$$\Delta \log \overline{w}_s = \bar{X}_s \hat{\beta}_n + \overline{m}_s + \bar{d}_s + \bar{t}_s - \log \overline{w}_{hs}\,, \tag{13}$$

where $(\bar{X}_s, \overline{m}_s, \bar{d}_s, \bar{t}_s)$ give the mean value of the covariates or (estimated) fixed effects for skill group s and $\log \overline{w}_{hs}$ is the mean log wage of H-1Bs in that group. There are no payroll savings in the bottom quartile, but the savings increase to 5.3 percent for workers in the second quartile, increase further to 16.3 percent for workers in the third quartile, and to 32.4 percent for workers in the top quartile.

Figure 3 shows how the hiring rate varies across the quartiles of the skill distribution after the imposition of the revenue maximizing fee in the low excess demand scenario. Given the monotonic increase in payroll savings with skills, the hiring rate is higher for more skilled H-1B workers. Suppose, for example, that the mean of the unobserved cost differential is zero (i.e., $\mu_\pi = 0$). The hiring rate ranges from 13.1 percent for workers in the bottom quartile of the skill distribution to 69.8 percent for workers in the top quartile. A policy initiative that charges the revenue-maximizing fee at the time an H-1B visa is issued, therefore, not only generates sizable revenues but also increases the skill level of the H-1B workforce.

Extensions of the model

I now relax two key simplifying assumptions underlying the simulations: (1) the H-1B wage is fixed during the six-year visa term; (2) and the worker remains with the firm for the entire period.[35]

The assumption that H-1B workers do not experience wage growth is unlikely to hold. The relative wage may increase as the workers accumulate work experience (and get a better sense of alternative opportunities). In fact, Table 5 showed that the wage gap between likely H-1Bs and comparable natives in the ACS shrank from about -17 percent at the time of arrival to about -6 percent by the end of the visa term, implying an annual growth rate of about 1.5 percent.

This increase in the relative cost of hiring H-1Bs influences the hiring decision. Suppose that the H-1B wage grows at a constant rate g and let R_g be the growth-adjusted discount factor given by $\sum_{t=0}^{5}[(1+g)/(1+r)]^t$. The employer hires an H-1B worker over a comparable native if:

$$\log w_h + \log(1+\pi_h) + \log R_g + \log\left(1 + \frac{F}{w_h(1+\pi_h)R_g}\right) \leq \log w_n + \log R\,. \qquad (14)$$

If the employer hired the H-1B in the absence of a fee, it must have been the case that:

$$\pi_h \leq \Delta w_{nh} + \log R - \log R_g\,. \qquad (15)$$

A comparison of equations (7) and (15) shows that the simulation exercise in a model that allows for wage growth is similar to the one reported in Table 6, except that the truncation point for the unobserved cost differential incorporates the difference in wage growth rates between the native and the H-1B workforce.

The model also assumed that the hire lasts for the full six-year term. As noted earlier, the annual job separation rate is 9.4 percent. Suppose that this rate is constant over

[35] One interesting extension of the analysis would examine the possibility of offshoring jobs now held by H-1Bs workers. This extension, however, would also need to address why many native jobs are not offshored despite the documented wage savings (Overby, 2011).

time. Job tenure then follows a geometric distribution: 9.4 percent of the workers stay on the job 1 year, 8.5 percent stay 2 years, 7.7 percent stay 3 years, 7.0 percent stay 4 years, 6.3 percent stay 5 years, and 61.0 percent stay all six years. The expanded simulation uses a uniform random variable in [0, 1] to allocate workers to the six possible values of tenure.

Table 8 summarizes the results of a simulation that allows for both job separations and wage growth, assuming a wage growth rate g of 1.5 percent. Consider the scenario where there is low excess demand and the mean of the unobserved cost differential is zero. The baseline simulation reported in Table 6 predicts a revenue-maximizing fee of $142,000, which falls to $117,000 in the more general exercise, a drop of about 20 percent. Across scenarios, Table 7 shows that the revenue-maximizing fee ranges from $97,000 to $190,000, that most visas are still used, and that the fee generates between $5 and $13 billion in revenue.

VII. Summary

The economic benefits from immigration are larger when the immigrant flow consists of high-skill workers. As a result, many immigrant-receiving countries set up visa programs to recruit such workers. The United States uses the H-1B program to grant temporary work permits to high-skill immigrants in "specialty occupations." The number of H-1B visas available to for-profit firms is legislatively capped at 85,000 new visas per year, and the H-1B workers typically cluster in science, engineering, or computer-related jobs.

The design of the H-1B program helps to create a long-term link between the firm and the worker. A *specific* firm requests permission for the temporary employment of a *specific* worker. In theory, the worker can move to other firms. The new firm, however, needs to go through the process of submitting a petition for the temporary employment of that person. This arrangement may give employers some market power, which likely reduces the wage of the H-1B workforce.

The analysis presented in this paper estimated the wage gap between H-1B workers and comparable U.S.-born workers and examined the implications of the gap for employer demand. The analysis merged data from three distinct sources: the Labor Condition Application (LCA) filed with DOL for temporary positions to be filled by foreign persons, the I-129 form filed with DHS petitioning the entry of a specific foreign-born person through the H-1B program, and the American Community Surveys (ACS) that provides the sample of native workers.

The evidence indicated that H-1B workers are cheaper. The average H-1B worker earns about 15 percent less than a U.S.-born worker in the same metropolitan area and with the same education, age, gender, occupation, and industry. Since comparable high-skill natives in the private sector earn more than $125,000 annually, the average payroll savings resulting from a single H-1B hire exceeds $100,000 over the six-year visa term.

These payroll savings suggest that firms might be willing to pay a substantial fee for the visa. The simulation of an economic model of the employer's hiring decision, combined with the excess demand for the foreign workers, revealed that even imposing visa fees exceeding $100,000 may not change the demand for H-1B workers all that much. The fee, however, will generate revenues likely exceeding $5 or $10 billion annually and change the skill composition of the H-1B workforce, making it more skilled.

Immigration policy in the United States partly consists of an alphanumeric soup of visa programs that permit temporary employment of certain classes of persons and that cater to specific sectors or industries (e.g., H-1B, H-2A, H-2B, H-3, O-1A, O-1B, OPT, etc.). The analysis of the H-1B program showed that the specific industry to which this program is targeted (i.e., the high-tech sector) has gained substantially from its access to a foreign-born high-skill workforce through lower labor costs. It would not be surprising if other sectors using other programs (e.g., the agricultural industry that relies on H-2A visas) also benefit substantially from those programs. It would be of interest to document the extent to which each of these programs has increased the wealth of very narrow interests. Such documentation might inform a revamping of guest worker programs so that the economic benefits from immigration are more widely shared.

References

Adda, Jérôme, and Christian Dustmann. 2023. “Sources of Wage Growth,” *Journal of Political Economy* 131 (2): 456–503.

Altonji, Joseph G., and Robert A. Shakotko. 1987. “Do Wages Rise with Job Seniority?” *Review of Economic Studies* 54 (3): 437-459.

Altonji, Joseph G., and Nicolas Williams. 2005. “Do Wages Rise with Job Seniority? A Reassessment,” *Industrial and Labor Relations Review* 58 (3): 370–397.

Blau, Francine D. and Christopher Mackie, eds. 2017. *The Economic and Fiscal Consequences of Immigration*. Washington, DC: National Academies Press.

Borjas, George J. 2017. “The Labor Supply of Undocumented Immigrants.” *Labour Economics* 46. https://doi.org/10.1016/j.labeco.2017.02.004.

Bound, John, Gaurav Khanna, and Nicolas Morales. 2018. “Understanding the Economic Impact of the H-1B Program on the United States.” In *High-Skilled Migration to the United States and Its Economic Consequences*, edited by Gordon H. Hanson, William R. Kerr, and Sarah Turner, University of Chicago Press, 2018, pp. 109–175.

Bourveau, Thomas, Derrald Stice, Han Stice, and Roger White. 2025. “H-1B Visas and Wages in Accounting: Evidence from Big 4 Payroll and the Ethics of H-1B Visas,” *Journal of Business Ethics* 199, no. B2 (2025): 309–330.

Card, David, Jesse Rothstein, and Moises Yi. 2024. “Industry Wage Differentials: A Firm-Based Approach,” *Journal of Labor Economics* 42 (S1): S11–S59.

Castillo, Marcelo, Alexandra Hill, and Thomas Hertz. 2024. “A Test of the Validity of Imputed Legal Immigration Status,” *Demography* 62 (2): 283–306.

Chen, Jun, Shenje Hshieh, and Feng Zhang. 2021. “The Role of High-Skilled Foreign Labor in Startup Performance: Evidence from Two Natural Experiments.” *Journal of Financial Economics* 142, no. 1: 430-452.

Citro, Constance F. and John Karl Scholz, editors. 2009. *Reengineering the Survey of Income and Program Participation.* Washington, DC: National Academies Press.

Clemens, Michael A. 2026. “Immigrant-Native Wage Gaps and Immigration Tariffs: Examining the Case for an H-1B Visa Tax,” IZA Working Paper No. 18435, March 2026.

Costa, Daniel and Ron Hira. 2020. “H-1B Visas and Prevailing Wage Levels: A Majority of H-1B Employers—Including Major U.S. Tech Firms—Use the Program to Pay Migrant Workers Well Below Market Wages,” Economic Policy Institute, May 4, 2020.

Czajka, John L., and Gabrielle Denmead. 2012. "Getting More from Survey Income Measures: Empirically Based Recommendations for Improving Accuracy and Efficiency," presented at the Federal Committee on Statistical Methodology Research Conference, Washington, DC.

Dimmock, Stephen G., Jiekun Huang, and Scott J. Weisbenner. 2022. "Give Me Your Tired, Your Poor, Your High-Skilled Labor: H-1B Lottery Outcomes and Entrepreneurial Success." *Management Science* 68 (September): 6950-6970.

Doran, Kirk, Alexander Gelber, and Adam Isen. 2022. "The Effects of High-Skilled Immigration Policy on Firms: Evidence from Visa Lotteries," *Journal of Political Economy* 130 (10): 2501-33.

He, Jiaxin and Adam Ozimek. 2026. "The Flawed Paper Behind Trump's $100,000 H-1B Fee," Economic Innovation Group, February 21, 2026. https://eig.org/the-flawed-paper-behind-trumps-100000-h-1b-fee/.

Hira, Ron. 2010. "Bridge to Immigration or Cheap Temporary Labor? The H-1B & L-1 Visa Programs are a Source of Both," Economic Policy Institute.

Hira, Ron. 2015. "New Data Show How Firms Like Infosys and Tata Abuse the H-1B Program," Economic Policy Institute, Feb. 19, 2015. https://www.epi.org/blog/new-data-infosys-tata-abuse-h-1b-program.

Hira, Ron, and Daniel Costa. 2021. "New Evidence of Widespread Wage Theft in the H-1B Visa Program: Corporate Document Reveals How Tech Firms Ignore the Law and Systematically Rob Migrant Workers." Washington, DC: Economic Policy Institute, December 9, 2021.

Hunt, Jennifer, and Marjolaine Gauthier-Loiselle. 2010. "How Much Does Immigration Boost Innovation?" *American Economic Journal: Macroeconomics* 2, no. 2 (April): 31–56.

Johnson, Matthew S., Kurt J. Lavetti, and Michael Lipsitz. 2025. "The Labor Market Effects of Legal Restrictions on Worker Mobility." *Journal of Political Economy* 133, no. 9 (September 1, 2025): 2735–2793. https://doi.org/10.1086/736217.

Kerr, William R., and William F. Lincoln. 2010. "The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention," *Journal of Labor Economics* 28 (July 2010): 473–508.

Kochhar, Rakesh, Kim Parker, and Ruth Igielnik. 2022. *Majority of U.S. Workers Changing Jobs Are Seeing Real Wage Gains.* Pew Research Center, July 28, 2022. https://www.pewresearch.org/social-trends/2022/07/28/majority-of-u-s-workers-changing-jobs-are-seeing-real-wage-gains/.

Krueger, Alan B., and Lawrence H. Summers. 1988. "Efficiency Wages and the Inter-Industry Wage Structure," *Econometrica* 56 (2): 259–293.

Lofstrom, Magnus and Joseph Hayes. (2011). "H-1Bs: How Do They Stack Up to U.S. Born Workers?" IZA Discussion Paper No. 6259, Institute for the Study of Labor (IZA).

Mahajan, Parag, Nicolas Morales, Kevin Y. Shih, Mingyu Chen, and Agostina Brinatti. 2024. "The Impact of Immigration on Firms and Workers: Insights from the H-1B Lottery." IZA Discussion Paper No. 16917, Institute for the Study of Labor (IZA).

OECD (Organisation for Economic Co-operation and Development). *International Migration Outlook 2024*. Paris: OECD Publishing, 2024. https://doi.org/10.1787/50b0353e-en.

Meyer Bruce D., Wallace K. C. Mok, and James X. Sullivan. 2015. "Household Surveys in Crisis." *Journal of Economic Perspectives* **29** (4): 199–226.

Ontiveros, Maria L. 2017. "H-1B Visas, Outsourcing and Body Shops: A Continuum of Exploitation for High Tech Workers." *Berkeley Journal of Employment & Labor Law* 38, no. 1 (2017): 1–47.

Overby, Stephanie. "IT Offshoring Savings Declined for Past 5 Years." *CIO.com*, January 31, 2011. https://www.cio.com/article/282557/outsourcing-it-offshoring-savings-declined-for-past-5-years.html.

Peri, Giovanni, Kevin Shih, and Chad Sparber. 2015. "STEM Workers, H-1B Visas, and Productivity in U.S. Cities." *Journal of Labor Economics* 33, no. S1 (April): S225–S255.

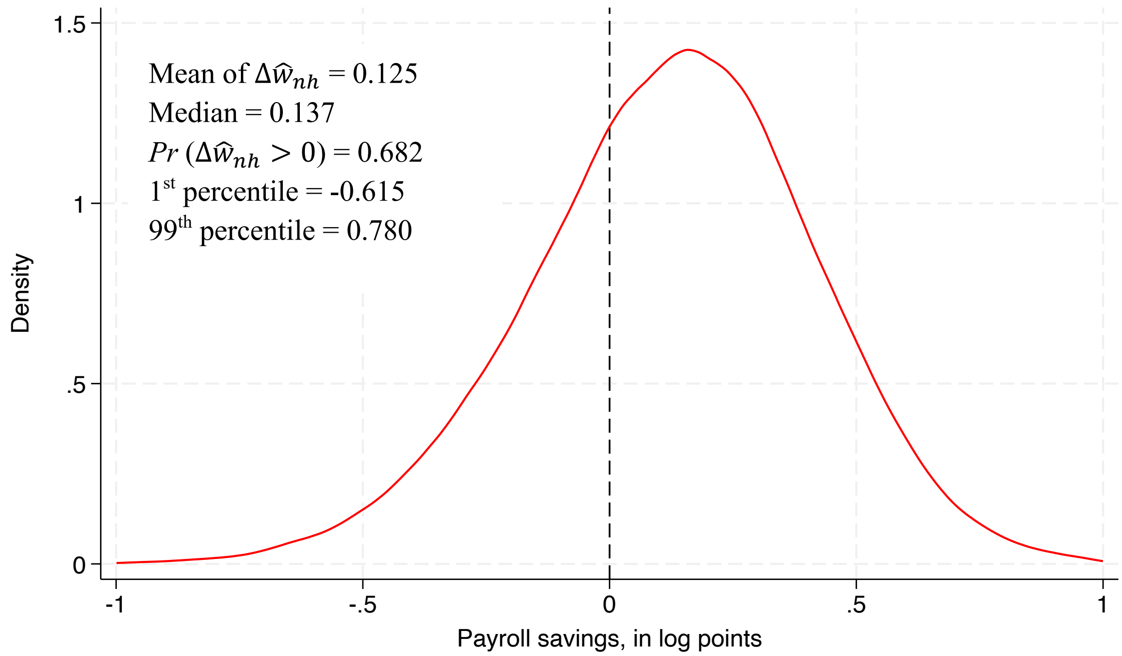
U.S. Citizenship and Immigration Services. 2023. "Modernizing H-1B Requirements, Providing Flexibility in the F-1 Program, and Program Improvements Affecting Other Nonimmigrant Workers," October 23, 2023. https://www.regulations.gov/document/USCIS-2023-0005-0001.

U.S. Citizenship and Immigration Services. 2026. H-1B Electronic Registration Process: Registration and Selection Statistics for FY 2021–FY 2024. Accessed January 2026. https://www.uscis.gov/working-in-the-united-states/temporary-workers/h-1b-specialty-occupations/h-1b-electronic-registration-process.

U.S. House of Representatives, 12 Mar. 2008, 110th Congress. *Testimony before the House Committee on Science and Technology: "Competitiveness and Innovation on the Committee's 50th Anniversary."* www.congress.gov/event/110th-congress/house-event/LC9246/text.

Varma, Roli, and James Rogers. 2020. "To Be or Not to Be on H-1B Visas: Engineers from India in the United States." *Perspectives on Global Development and Technology* 19 (2020): 281–302.

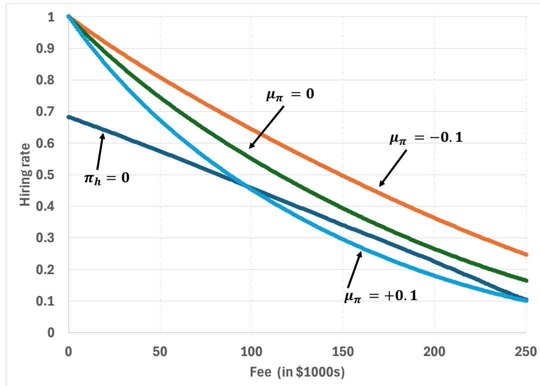
Figure 1. Distribution of payroll savings across H-1B workers



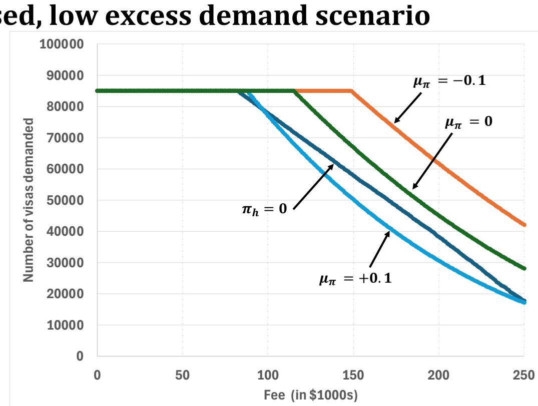
Notes: The "payroll savings" give the difference between the predicted log earnings a particular H-1B worker would earn if he were native and the worker's actual log earnings. The predicted log earnings are calculated from a regression estimated in the sample of native workers that includes education, gender, age, occupation, industry, and metropolitan area fixed effects. The distribution is shifted to the left by 0.029 log points to adjust for job seniority bias.

Figure 2. Impact of a fee on the probability of hire, number of visas, and revenue

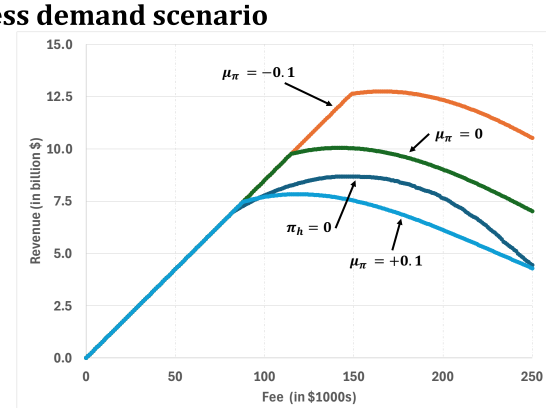
A. Hiring rate



B. Number of visas used, low excess demand scenario

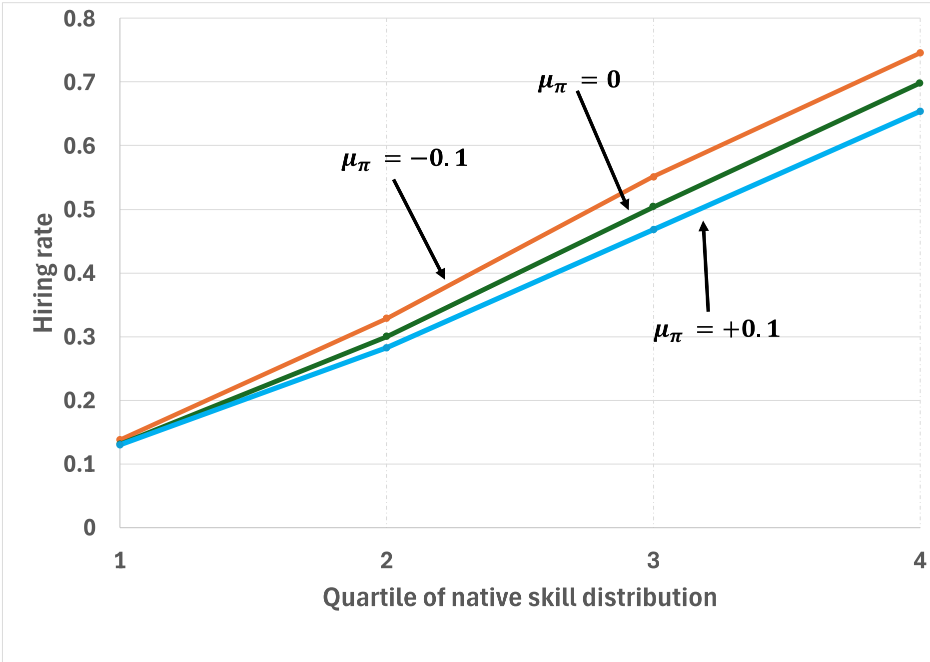


C. Revenue, low excess demand scenario



Notes: The hiring rate is calculated across 100 replications of the model simulating the firm's hiring behavior under alternative assumptions about the existence and size of the unobserved cost effect when hiring an H-1B worker. The simulation with $\pi_h = 0$ assumes there is no unobserved cost at all; the simulation with $\mu_\pi = k$ assumes that the mean of the distribution of unobserved cost differentials is k (measured as the log point change in the cost of a hire). The "low excess demand" scenarios in panels B and C assume that the number of lottery registrations is twice the capped number of visas, or 170,000. The simulations use a 3 percent rate of discount.

Figure 3. Hiring rate at revenue-maximizing fee in low excess demand scenario, by skill group



Notes: The hiring rate is the average calculated across 100 replications of the model simulating the firm's hiring behavior at the revenue maximizing fee, using alternative assumptions about the existence and size of the unobserved cost differential (see Table 6 for the value of the revenue maximizing fee in each scenario). The average is calculated separately in the subsample of H-1B workers in each quartile of the native skill distribution. The simulations use a 3 percent rate of discount.

Table 1. Summary Statistics

	H-1B workers	Natives
Demographics:		
Annual salary (1000s)	$112.6	$127.1
Log annual salary	11.58	11.53
Age	31.9	35.8
Male (%)	67.2	55.1
Bachelor's degree (%)	52.3	71.8
Master's degree (%)	41.8	20.9
Professional degree (%)	0.9	4.6
Doctoral degree (%)	5.0	2.7
Top 5 metros of employment:		
1.	New York (13.2%)	New York (7.5%)
2.	Dallas (9.2%)	Los Angeles (4.0%)
3.	San Jose (8.2%)	Chicago (3.8%)
4.	Seattle (7.2%)	Dallas (3.0%)
5.	San Francisco (6.0%)	Washington, DC (2.6)
% in top 5 H-1B metros	43.9%	15.1%
Top 5 occupations:		
1.	Software developers (38.3%)	Other managers (5.4%)
2.	Computer occupations, all other (14.0%)	Software developers (4.2%)
3.	Computer systems analysts (5.3%)	Registered nurses (3.5%)
4.	Other math science occupations (3.2%)	Accountants and auditors (3.5%)
5.	Electrical and electronics engineers (3.0%)	Financial managers (2.5%)
% in top 5 H-1B occ.	63.8%	7.8%
Top 5 industries:		
1.	Computer systems design (47.8%)	Computer systems design (7.7%)
2.	Management and scientific services (5.6%)	General medical hospitals (4.8%)
3.	Not specified retail trade (4.9%)	Construction (3.9%)
4.	Architect, engineering services (3.5%)	Manag., scientific consulting (3.5%)
5.	Software publishers (3.5%)	Architect, engineer services (3.4%)
% in top 5 H-1B ind.	65.3%	15.7%
Sample size	343,606	581,868

Notes: The native sample is drawn from the 2021-2024 ACS and consists of U.S.-born salaried workers in the private sector, who are aged 21-50, have at least a college degree, and work full-time year-round. The sample of H-1B workers (also aged 21-50) is drawn from the I-129 petitions for new visas filed by for-profit employers between FY2021 and FY2024, selected by the lottery, and approved by DHS. The calculations use the ACS sampling weight for the native sample and a weight set equal to one for H-1B workers. Earnings are in 2025 dollars.

Table 2. Estimates of the H-1B wage gap
(Dependent variable = log annual earnings)

	Regression specification				
	(1)	(2)	(3)	(4)	(5)
A. Baseline regressions					
1. OLS	0.044	-0.062	-0.023	-0.136	-0.155
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
2. Quantile	0.072	-0.026	-0.013	-0.128	-0.147
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
Native sample reweighted to:					
B. H-1B geographic distribution					
1. OLS	-0.099	-0.073	-0.023	-0.162	-0.174
	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)
2. Quantile	-0.056	-0.032	-0.012	-0.154	-0.167
	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)
C. H-1B occupation-industry distribution					
1. OLS	-0.248	-0.293	-0.271	-0.173	-0.175
	(0.005)	(0.006)	(0.007)	(0.006)	(0.007)
2. Quantile	-0.237	-0.284	-0.268	-0.167	-0.169
	(0.005)	(0.006)	(0.007)	(0.006)	(0.007)
Controls in regression:					
Metropolitan area fixed effects		✓	✓	✓	✓
Education, age, gender f.e.			✓	✓	✓
Occupation f.e.				✓	✓
Industry f.e.					✓

Notes: Robust standard errors reported in parentheses. All regressions also include a vector of year fixed effects. The regressions have 925,474 observations. The weight used in the regression is the ACS sampling weight for the native sample and is set to one for all H-1B workers.

Table 3. The H-1B wage gap in the 25 largest firms

	Firm	Number of visas	Average salary (1000s)	Adjusted log wage gap
1.	Amazon.com Services	13,301	150.0	0.170*
2.	**Infosys**	**10,198**	**96.9**	**-0.172***
3.	**Tata Consultancy Services**	**7,938**	**98.4**	**-0.208***
4.	**Cognizant Technology Solutions**	**6,308**	**103.4**	**-0.142***
5.	Google	5,179	166.8	0.008
6.	Microsoft	4,271	150.4	-0.071*
7.	IBM	4,236	117.4	-0.026*
8.	Meta	3,944	171.5	0.118*
9.	**Wipro**	**3,436**	**92.9**	**-0.396***
10.	**Capgemini**	**3,090**	**113.5**	**-0.174***
11.	**HCL**	**2,828**	**101.8**	**-0.351***
12.	Apple	2,609	173.5	-0.086*
13.	Intel	2,527	136.7	0.080*
14.	Accenture	2,463	114.3	-0.012
15.	Ernst & Young	2,127	115.1	-0.054*
16.	Amazon Web Services	2,095	135.9	-0.080*
17.	Amazon Development Center	1,889	146.2	-0.040*
18.	**Tech Mahindra**	**1,884**	**101.3**	**-0.370***
19.	Deloitte Consulting	1,836	111.8	-0.053*
20.	Oracle	1,617	154.7	-0.095*
21.	Wal-Mart	1,416	138.2	0.236*
22.	Qualcomm Technologies	1,390	143.9	0.086*
23.	McKinsey & Company	1,289	173.8	0.265*
24.	**Larsen & Toubro Infotech**	**1,242**	**118.8**	**-0.247***
25.	Tesla	1,036	137.0	-0.046*
	All other firms	253,457	114.1	-0.183*

Notes: *Significant at the 5 percent level. The firm-specific adjusted log wage gaps are estimated from an OLS regression that pools natives and H-1B workers and that includes education, age, gender, year, occupation, industry, metropolitan area fixed effects, and a vector of indicator variables set to unity if the observation denotes an H-1B worker in a specific firm (and zero otherwise). The regression has 925,474 observations. The weight used in the regression is the ACS sampling weight for the native sample and is set to one for all H-1B workers. The bolded firms are considered to be outsourcing pipelines for H-1B workers.

Table 4. Estimates of the wage gap using different surveys for native baseline

Native sample	Adjusted log wage gap	Number of native observations
1. ACS, 2021-2024	-0.155*	581,868
	(0.003)	
2. CPS-ASEC, 2022-2025	-0.155*	34,565
	(0.012)	
3. CPS-ASEC, 2022-2025, merged with CPS Basic data	-0.199*	8,858
	(0.020)	
4. CPS-ASEC, 2022-2025, workers with only one job	-0.194*	8,072
	(0.021)	
5. SIPP, 2022-2024, earnings on main job	0.022	1,262
	(0.043)	
6. SIPP, 2022-2024, total earnings	0.009	1,262
	(0.043)	

Notes: *Significant at the 5 percent level. All native samples consist of U.S.-born salaried workers in the private sector, who are aged 21-50, have at least a college degree, and work full-time year-round. The regressors include age, educational attainment, gender, year, geography, occupation, and industry. The geography fixed effects indicate the metropolitan area of employment in the ACS, the metropolitan area of residence in the CPS, and the state of residence in the SIPP. The SIPP regressions also include a binary indicator of whether the person resides in an identified metropolitan area. The CPS Basic monthly files report whether a person works in more than one job in the survey week. The regression reported in row 4 uses the merged ASEC/Basic sample that consists of natives who never reported working in more than one job during the monthly interviews in the relevant calendar year.

Table 5. The wage gap between "likely H-1Bs" and natives in the ACS

	Imputation filter			
	Works in top 5 occupations or top 5 industries		Works in top 5 occupations and top 5 industries	
Variable:	(1)	(2)	(3)	(4)
Likely H-1B	-0.081*	---	-0.155	---
	(0.006)		(0.009)	
By years in the country				
1 year	---	-0.149*	---	-0.208*
		(0.014)		(0.022)
2 years	---	-0.099*	---	-0.171*
		(0.014)		(0.025)
3 years	---	-0.060*	---	-0.134*
		(0.015)		(0.025)
4 years	---	-0.065*	---	-0.132*
		(0.016)		(0.022)
5 years	---	-0.047*	---	-0.128*
		(0.012)		(-0.020)
6 years	---	-0.021	---	-0.097*
		(0.012)		(0.020)

Notes: *Significant at the 5 percent level. The regressions have 592,099 observations. The sample consists of salaried workers in the private sector, who are aged 21-50, have at least a college degree, and work full-time year-round. The sample consists of native workers and likely H-1Bs, excluding the likely H-1Bs who arrived in the United States in the same year as the ACS cross-section. The regressors include age, educational attainment, gender, year, occupation, industry, and metropolitan area of employment fixed effects. The likely H-1B variable indicates if the worker is a noncitizen, who migrated after age 18, has been in the United States fewer than 6 years, and works in an occupation and/or industry where H-1B workers concentrate.

Table 6. Impact of a visa fee on the demand for H-1B workers

	Mean of unobserved cost differential		
Baseline number of lottery registrants prior to fee:	μ_π = -0.1	μ_π = 0.0	μ_π = +0.1
A. Low excess demand (*N* = 170,000)			
Revenue-maximizing fee ($1000s)	$166.0	$142.0	$118.0
Hiring rate at revenue-maximizing fee	45.2%	41.6%	39.1%
Number of visas demanded (1000s)	76.8	70.8	66.4
Total revenue (billion $)	$12.8	$10.1	$7.8
B. Moderate excess demand (*N* = 255,000)			
Revenue-maximizing fee ($1000s)	$212.0	$172.0	$137.0
Hiring rate at revenue-maximizing fee	33.4%	33.4%	33.2%
Number of visas demanded (1000s)	85.0	85.0	84.6
Total revenue (billion $)	$18.0	$14.6	$11.6
C. High excess demand (*N* = 340,000)			
Revenue-maximizing fee ($1000s)	$249.0	$207.0	$168.0
Hiring rate at revenue-maximizing fee	25.0%	25.0%	24.9%
Number of visas demanded (1000s)	84.9	84.8	84.7
Total revenue (billion $)	$21.1	$17.6	$14.2

Notes: The hiring rate used to calculate the revenue-maximizing fee and total revenue is the average from 100 replications of the model of the firm's hiring behavior. The level of excess demand gives an estimate of the number of lottery registrations (*N*) prior to the imposition of any fee; it equals twice, three times, or four times the number of capped visas (85,000). The unobserved cost differential is assumed to be normally distributed for the population of H-1B lottery registrants during the 2021-2024 period, and the variance is uniquely determined by the assumption that 99 percent of the values of π_h lie between -0.5 and +0.5 in the case where the mean is zero (μ_π = 0.0). The entire distribution is then shifted to the left or to the right for alternative assumptions about the mean. The simulations use a 3 percent rate of discount.

Table 7. Impact of a visa fee, allowing for wage growth and job separations

	Mean of unobserved cost differential		
Baseline number of lottery registrants prior to fee:	μ_π = -0.1	μ_π = 0.0	μ_π = +0.1
A. Low excess demand (*N* = 170,000)			
Revenue-maximizing fee ($1000s)	$138.0	$117.0	$97.0
Hiring rate at revenue-maximizing fee	37.3%	34.7%	32.8%
Number of visas demanded (1000s)	63.3	59.0	55.0
Total revenue (billion $)	$8.7	$6.9	$5.4
B. Moderate excess demand (*N* = 255,000)			
Revenue-maximizing fee ($1000s)	$154.0	$122.0	$97.0
Hiring rate at revenue-maximizing fee	33.1%	33.3%	32.8%
Number of visas demanded (1000s)	84.5	82.6	83.8
Total revenue (billion $)	$13.0	$10.3	$8.1
C. High excess demand (*N* = 340,000)			
Revenue-maximizing fee ($1000s)	$190.0	$155.0	$123.0
Hiring rate at revenue-maximizing fee	25.0%	24.9%	25.0%
Number of visas demanded (1000s)	85.0	84.5	85.0
Total revenue (billion $)	$13.0	$13.1	$10.5

Notes: The hiring rate used to calculate the revenue-maximizing fee and total revenue is the average from 100 replications of the model of the firm's hiring behavior. The level of excess demand gives an estimate of the number of lottery registrations (N) prior to the imposition of any fee; it equals twice, three times, or four times the number of capped visas (85,000). The unobserved cost differential is assumed to be normally distributed for the population of H-1B lottery registrants during the 2021-2024 period, and the variance is uniquely determined by the assumption that 99 percent of the values of π_h lie between -0.5 and +0.5 in the case where the mean is zero ($\mu_\pi = 0.0$). The random variable giving the (percent) payroll savings from offshoring is assumed to be normally distributed with a mean of -0.25 and a variance uniquely determined by the assumption that 99 percent of its values lie in the [-0.5, 0] interval. The simulations use a 3 percent rate of discount and assume that the annual wage growth rate of H-1B workers is 1.5 percent.

Appendix: Crosswalks between the I-129 and ACS data files

Geography:

The I-129 filing reports the worksite zip code, while the ACS reports the metropolitan area of employment using 2023 Core-Based Statistical Area (CBSA) codes. The crosswalk was produced using the GEOCORR geographic correspondence engine. Some zip codes map into more than one metropolitan area. I simplified by allocating the zip code to the metropolitan area with the largest population. Zip codes that could not be assigned to a metropolitan area identified in the ACS were instead given a metropolitan-area code equal to the state FIPS code (and the same was done for observations in the ACS where the metropolitan area is not identified). The GEOCORR engine is available at https://mcdc.missouri.edu/applications/geocorr.html.

Occupation:

The 538 unique occupation codes in the Census classification scheme used in the 2023 ACS (IPUMS variable *occ*) provide far less detail about the worker's job than the 1,835 categories in the LCA data, which are based on 8-digit Standard Occupational Classification (SOC) codes. The crosswalk was created by first truncating the SOC data in the LCA to 6 digits, and then using crosswalks produced by the Census Bureau (for both the pre- and post-2018 SOC codes) that directly link 6-digit SOC codes to the coding of the variable "*occ*" in the IPUMS ACS. The SOC code in the I-129 files was invalid for 39 observations, and these observations are excluded from any analysis that relies on occupation information. The census crosswalks are available at www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html.

Industry:

The I-129 data reports the industry of employment using the North American Industry Classification System (NAICS). The crosswalk was constructed by truncating the NAICS codes to four digits, and then using crosswalks produced by IPUMS that link the NAICS code to the variable "*ind*" in the ACS. The industry code in the I-129 files was invalid for 1,081 observations, and these observations are excluded from any analysis that relies on industry information. The IPUMS industry crosswalks are available at https://usa.ipums.org/usa/volii/indtoindnaics.shtml.