I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 18321

H-1B Visa Program, Visa Cap and Foreign Worker Earnings

Kusum Mundra
Omid Bagheri

DECEMBER 2025

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 18321

H-1B Visa Program, Visa Cap and Foreign Worker Earnings

Kusum Mundra
Rutgers University and IZA

Omid Bagheri
Kent State University

DECEMBER 2025

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

H-1B Visa Program, Visa Cap and Foreign Worker Earnings*

Using various years of data from the National Survey of College Survey we examine the earnings of work visa immigrants who entered the U.S. during the various H-1B cap periods and whether the cap was binding or not at the time of their entry. For work visa entrants in the non-academic sector as well as from cap bound countries, we find that earning premium relative to college graduate natives ranges between 17%-25% if the immigrants entered the U.S. during the initial period of H-1B and during the later binding cap periods. This premium is lost if immigrants first entered on H-1B during the non-binding period. Compared to pre 1990 work immigrants we find there is a drop in earnings for immigrants who entered on H-1B during the non binding period. This is not seen in the academic sector and for five cap exempt countries, where cap is not relevant. Our findings are driven by the H-1B program involving staffing agencies hiring of low ability workers and workers facing wage suppression with limited job mobility. Work visa entrants may also face scarring in the labor market because of lack of U.S. education experience. We do not find this drop in earning for student visa entrants who are admitted by the university selection process.

JEL Classification: J61, J24, J31, J1

Keywords: H-1B, visa cap, high-skilled immigrants, earnings

Corresponding author:
Kusum Mundra
Department of Economics
Rutgers University, Newark
360 Dr. Martin Luther King Jr. Blvd.
Newark New Jersey 07102-1801
USA

Email: kmundra@newark.rutgers.edu

* Helpful comments were received from Catalian Amuedo-Dorantes, Laura Bellows, Fernando Rios-Avila and participants at the American Economic Association 2025, APPAM Conference 2024, Southern Economic Association 2024, Eastern Economic Association 2023 and seminar participants at the Lafayette College.

1. Introduction

The computer technology revolution has drastically increased the demand for the skilled workforce around the world and many high-income immigrant receiving countries and firms have implemented different immigration policy to attract skilled foreign workers. The H-1B visa in the U.S. is one such policy. Initiated through the 1990 Immigration Act H-1B is a non-immigrant visa providing a legal mechanism primarily for technology firms to temporarily hire workers in specialty occupations where there is a shortage of workers in the U.S.[1] The U.S. Congress caps the number of H-1B visas allocated each year to restrict the flow of high skilled immigrants because of concerns of increased immigration into the U.S. (Czaika and Parsons 2017; and Kennedy 2019).

H-1B immigrants have been fundamental for innovation and economic growth but given the concerns that H-1B immigrants take away high paying jobs from natives Congress capped the number of new H-1B visas that would be distributed every year. Given the high demand for foreign workers for most of the years post 1990, the H-1B cap has been binding and firms compete through a lottery system to attract these highly skilled workers. The two H-1B non-binding periods are the early period of 1990 – 1996 when the cap was 65,000 and 2001 -2003 when the cap was significantly increased to 195,000. The two binding periods are 1997 – 2000 when the cap was 65,000 and further increased to 115,000 and the recent period of 2004 onwards when the H-1B cap was reduced to the original limit of 65,000, with additional 20,000 visas for MA degree holders, see Figure 1. In this paper we examine the earnings of immigrants who first enter U.S. on work visas during different H-1B cap periods and whether the cap was binding or not using the data from the National Survey of College Graduate (NSCG) for the years 2003, 2010, 2013, 2015 and 2017. The earnings of these immigrants are compared relative to natives as

[1]These immigration initiatives have led to a substantial increase in high-skilled immigrants in the U.S. In 2010 U.S. hosted 11.4 million skilled migrants with at least one year of tertiary education and 41 percent of the total OECD migrants (Kerr et al. 2016). In 2021 immigrants constituted approximately 19% of US Stem workforce and the share for doctoral level employees in science and engineering is close to 60% (National Science Foundation 2024 report).

well as to the earnings of immigrants who came to the U.S. on work visas before 1990, the year when H-1B visa program was implemented.

The earnings of immigrants who enter the U.S. first on work visa will be affected by the entry period as well as whether the H-1B cap is binding or not. With a non-binding cap there is a possibility that many immigrants who come on work visa are often selected not from the top tail of the home country skilled distribution and are often employed in entry college level IT jobs in the U.S.[2] This could also be because of the way the H-1B Visa Program has been implemented that it has allowed the majority of H-1B visa allocation and employment in the U.S. to be controlled by few outsourcing firms, such as Tata Consultancy or Infosys that often brings H-1B immigrants, mostly from China and India, in low paying jobs and this could possibly be more prevalent and adverse when the H-1B cap is not binding.[3] Lower ability high skilled immigrants are also often employed by their home country multinational enterprises at lower wages in the U.S. because this allows them to migrate to the U.S. easily (Morales 2025).

Moreover, immigrants coming on work visa with no U.S. college education or U.S. college experience may face more of immigrant scarring in the U.S. labor market compared to immigrants who first enter U.S. on a student visa and are more assimilated into the U.S. labor market because of their U.S. education. Workers who come on H-1B might face more negative perception from co-workers and even employers and may face more labor market discrimination

---

[3] Many Silicon Valley companies argue that they rely on the program to recruit the best and brightest workers. And about 40 percent of the 85,000 H-1B visas available each year don't go to those companies. Instead, they're snapped up by outsourcing firms like the ones hired by Disney and California Edison. "This shows how powerful the tech lobby is,….. The H-1B program] is very profitable for all these companies, so they will continue to fight for it."
"Last year, Walt Disney World caused a scandal when it let go of more than 200 IT workers and hired an outsourcing firm to replace them with foreign workers on H-1Bvisas—a program that helps American employers hire foreign workers with specialized skills that they claim they can't find in the United States (a claim that makes littles sense when laying off people already doing those jobs). Southern California Edison, utility company based in the Los Angeles area, made a similar move a month later, firing more than 400 IT workers. And this summer, the University of California, San Francisco, laid off 80 tech employees after signing a contract with the same outsourcing firm that Disney hired. This is not how the H-1B program was intended to be used." *There's a Clear Way to Fix the H-1B Visa Program, The Atlantic April 7, 2016.*

and scarring than other skilled immigrants such as who come on student visas and go to school in the U.S. Simultaneously they might face more hurdles or no prospects of naturalization, which might be detrimental to their long-term labor market outcomes.

The H-1B visa requires immigrants who come on work visas be paid comparably to native workers at the firm and the geography level for similar education, experience and job responsibilities. Even if there were some provisions in place that firms that relied heavily on H-1B workers attempt to hire native workers legally, they were not barred from hiring a H-1B workers who could be of lower skill than natives and paid less. Given how the majority of H-1B immigrants are hired by couple big outsourcing firms in the U.S. rather than the firms directly, there exists a strong monopsony power in hiring these workers who are often paid lower than the market wages (Hira et al and Onteviros).[4] The legal dependency of H-1B workers on their employers makes H-1B workers face a wage penalty compared to natives and often employers pay them substantially less than natives for the same jobs (see Hira 2005, Matloff 2008, Miano 2007 and Bourveau 2019).[5]

Workers on work visas in academic jobs (Universities & colleges as well as research institutions) as well as immigrants on work visas from Canada, Mexico, Singapore, Chile, and Australia are exempted from the H-1B cap restrictions. The selection issue due to the H-1B cap as well as whether the cap is binding or not for the year when the immigrants first enter the country will not affect immigrant earnings for academic jobs and immigrants from the cap

[4] "About 80% of the H-1B workers who top three employers – Tata, Cognizant, and Infosys hire hold no more than a Bachelor's degree." Hira (2016)

[5] Many companies who employ temporary workers through H-1B visa pay them less than U.S. citizens earn for comparable work and do not sponsor H-1B workers for citizenship (Hira 2016, Economic Policy Institute; https://www.epi.org/blog/top-h-1b-employers-use-visa-program-for-temporary-labor-not-as-bridge-to-permanent-immigration/.

Costa and Hira 2020, EPI. https://www.epi.org/publication/h-1b-visas-and-prevailing-wage-levels/
Most of the workers come through global outsourcing firms which are exempted from federal regulations and can bring a H-1B worker if they pay them an annual salary of $60,000, which is sharply below the market wage, (Hira, 2005).

exempt countries. We estimate the earning of immigrants who come on work visa in non-academia, academia, from the cap-bound countries and five cap exempt countries. We also compare earnings of immigrants if they first enter U.S. on work visa versus if they entered on student visa during the various H-1B cap periods. The H-1B skilled temporary visa policy in place for foreign workers with no U.S. education will affect the selection of immigrants if they are coming on work visa and will be more adverse when the cap is binding but will not affect temporary immigrants if they are entering the U.S. for the first time on student visa. Immigrants on the student visa are admitted through the admission committee of the graduate school in various departments and are selected based on the selection criteria of the various programs in the U.S.

Congress enacted the H-1B visa program with the intent of helping U.S. employers who otherwise would not find appropriate skilled workers from the native domestic workforce, though new papers looking at the H-1B lottery data at the firm level are finding that is often not the case. Doran et al. (2022) report that H-1B workers do not have particularly unique skills that firms otherwise cannot obtain from native workers, and they also find that at the firm level winning one additional H-1B visa crowds out 1.5 native workers at the firm. Mayda et al (2023) show that firms that rely on H-1B visas during H-1B shortages have lower profits than firms that use less H-1B visas. How H-1B visa policy affects earnings growth and economic assimilation of the high-skilled immigrants in the U.S. is missing from the literature. Using a cross-sectional college graduate pooled sample over many years this paper focusses on how the earnings of work visa entrants is affected by the period they entered the U.S. Immigrants who entered on work visa are compared to immigrants who enter on student visa during the same period to get some insight into mechanics of the earnings dynamics through the various H-1B cap period and whether the cap is binding or not.

Our findings show that the wage premium for immigrants who entered on work visa during the various H-1B cap periods effects their wages. Immigrants who came on H-1B visas during the non-binding increased cap of 195,000 from 2001-2003 is significantly lowered compared to the natives as well as work visa entrant before 1990. Immigrants who entered during and after 2004, when the cap is drastically lowered to 65,000 and is binding, earned a

greater premium over natives as well as earlier immigrant cohorts. We also find that during 2001-2003, possibly the peak period of H-1B hiring through many outsourcing firms and the second non-binding period of H-1B work visa entrants', earnings significantly dropped relative to their earlier cohorts signaling potential drop in immigrant quality and worsening of immigrant scarring. This is seen in non-academia and for cap bound countries. However, this is not seen in academia and for cap exempt countries where the H-1B cap is not relevant. Also, this drop in earnings is not seen for the student visa entrants so there is evidence of immigrant scarring for work visa entrants.

Skilled immigrants are fundamental to the innovation and growth of the U.S economy and the aim of this paper is to shed some light on how the H-1B changing caps, H-1B hiring policy and possible immigrant scarring influence the earning of work visa immigrants who enter U.S. during different H-1B quota periods.[6] Immigrants' economic assimilation dictates the well-being of immigrant population as well as their economic and social integration into the U.S. society.[7] This is also relevant for high-skilled immigrants where we want the U.S. immigration policy to be effective in attracting the best and the brightest from around the globe and to hire and pay them fairly. It is important to look at how various cap changes and implementation of the H-1B Program is impacting skilled immigrant earnings in the U.S., since an effective skilled immigration policy is fundamental for bringing in global talent from around the world and to keep up the innovation and economic growth in the U.S.

In section 2 we discuss the H-1B visa policy and immigrant earnings, and section 3 is focused on the data and trends. Section 4 discusses the empirical methodology, and section 5 presents the results. We conclude in section 6.

---

[6] There is increasing literature showing that skilled immigration has a positive rather than negative spillovers on the U.S. innovation and economic growth particularly increased patents buy both immigrants and natives (Hunt 2011, Hunt and Gauthier-Loiselle 2010, Stuen et al. 2010 and Kerr and Lincoln 2010).

[7] Analyzing earning dynamics and economic assimilation of immigrants in the U.S. has been primarily focused on low skilled immigrants from Latin America and particularly Mexico. Borjas 1985, 1999 and Rivera-Batiz 1990, find that the recent cohorts have lower levels of education and labor market skills than the earlier cohorts.

2. H-1B Visa Policy and Immigrant Earnings

H-1B is employment policies where firms can apply for temporary work visa for foreign workers to work for three years with a possibility of one additional three-year renewal and with no pathway to naturalization. At the time of its creation, 65,000 H-1B visas became available for the new applicants yearly and the cap was increased to 115,000 in the year 1999 as a part of the American Competitiveness and Workforce Improvement Act and further increased to 195,000 for the years 2001-2003 Post 2004 there has been a cap of 65,000 on first time H-1B visa for non-academic firms and an additional 20,000 visas for MA and above degree (under Advanced Degree Requirement), see Figure 1.[8] Post 2004 the last cap change H-1B cap has been binding every year. This cap has been a negotiation not only between labor and capital but also between tech firms as well as universities that require highly skilled immigrants and various labor and citizen groups (Kennedy 2019).

H-1B visas are non-immigrant visas which are sponsored by the firms and the firms also pay a fee for these visas to the USCIS. At the end of the three-year term, an individual on H-1B can leave the U.S. or their visa can be renewed. It is possible for foreign workers to move to another firm before the end of their three years but the mobility of workers with H-1B is limited. The employer files a Labor Condition Application (LCA) with the USCIS where the information of the worker including their education, and the country of origin must be specified. Once accepted the hiring employer files a I-29 with the detail wage contracts. Given the cap and excess demand for H-1B visas for almost all the years the number of for-profit firms' visa applications exceeded the excess visa applications were entered into a random lottery and if the LCA won the lottery then the employer could file a I-29 for a H-1B visa for the foreign worker for the next year. When the H-1B visa program was constituted, it was meant to provide a temporary and a quick way for U.S. firms to employ foreign skill workers at fair wages and if native workers with similar qualifications were available, they were potentially not displaced by foreign workers. As the H-1B visa program states that "the employer/agent will pay the H-1B worker a wage which is no less than the wage paid to similarly qualified workers or, if greater, the prevailing wage for

[8] Compete America, a group which served both academic and corporate interests pressured Congress to have 20,00 master's students exempted from this cap (Olson 2004).

the position in the geographic area in which the H-1B worker will be working" and that "The employer/agent will provide working conditions that will not adversely affect other similarly employed workers." For details on the H-1B visa policy, changes and the lottery see USCIS[9]

Earnings of immigrants who enter on work visa will be affected by the entry period as well as whether the H-1B cap is binding or not. With an increase in the H-1B cap and the cap not binding there is a possibility that many immigrants who come on work visa are not the best and the brightest and are often employed in entry level IT jobs in the U.S.[10] This could also be because of the way the H-1B visa Program have been implemented that it has allowed the majority of H-1B visa allocation and employment in the U.S. to be controlled by couple outsourcing firms, such as Tata Consultancy or Infosys. These firms employ H-1B immigrants, mostly from China and India, in entry level jobs and possibly they are not selected from the top of the skill distribution in the home country, and this is more prevalent and adverse when the H-1B cap is not binding. During the cap non-binding period these immigrants are possibly less positively selected from the home country skill distribution and paid lower wages than the market wages.

Employers may hire foreign workers to replace more skilled natives at lower wages. There was a provision in the H-1B Visa Program that if firms pay the worker $60,000 annually then they can hire H-1B workers with at least a college degree. The current H-1B Program does not have an effective oversight in place regarding the labor contract and working hours and compensation if the H-1B foreign workers are hired through the middle staffing agencies.[11] Given how middle staffing agencies, outsourcing or insourcing firms, can legall pay workers below market wages and without an effective oversight this could lead to potentially lower

[9] https://www.uscis.gov/working-in-the-united-states/h-1b-specialty-occupations. For details on the H-1B lottery Program and a good discussion see Doran et al(2022), Mahajan et al(2024) to name a few.

[11] Even if in policy the firm submitting the H-1B application (Form I-129) firms have to attest the following that " H-1B nonimmigrants will be paid at least the actual wage level paid by the employer to all other individuals with similar experience and qualifications for the specific employment in question or the prevailing wage level for the occupation in the area of employment, whichever is higher", many firms particularly large employers that are H-1B dependent heavily use staffing services where there is often no oversight of the workers labor contract , see GAO Report to Congressional Committees (2011).

wages for H-1B workers, particularly during the periods of excessive H-1B hiring through the middle staffing agencies. H-1B visas are tied to the employers and legally have a limited mobility to change jobs or are aware that they can potentially change jobs while they are on H-1B visas, particularly if they are hired by the outsourcing firms.[12] During the various H-1B periods we see that there are many lawsuits, which did expose that many outsourcing firms were hiring work visa immigrants on H-1B and paying them lower than their green card and U.S. citizen employees. Many of these lawsuits potentially happened because the workers were hired through these staffing agencies without much oversight and the 1998 provision allowed that legally firms can hire these workers if they were paid at least $60,000.[13]

In addition to the low skill selection, there is a potential immigrant scarring for immigrants who first enter on work visa versus student visa. This scarring and ghetto effect on immigrants on work visa will be more severe if work visa immigrants entered during the non-binding cap period which effects workers long-term labor market outcomes more severely than the binding period. Skilled workers who do not come on student visa and do not obtain their highest degree in the U.S. are scarred in the labor market as well are behind in their assimilation, naturalization, and integration rates in the U.S. These workers face discrimination and difficulty in assimilation and integration compared to other high skilled immigrants who came to the U.S. on student visa and have U.S. education experience and networks in the U.S. labor market.

Because we use NSCG for years and have group of immigrants entering the U.S. over a long period of time we can account for this H-1B cap exemption at various periods. U.S. skilled immigration policy exempts employers in higher education, nonprofit entities, and U.S. Government research institutions (academia sector) from the H-1B cap and trade treaties with five countries allows the use of alternative work visas instead of H-1B. We compare earning dynamics through the various H-1B binding and non-binding periods across academia and non-academia as well as for cap exempt and cap bound countries. Work immigrants from Mexico and

[12] Depew et al.(2013) analyzed for a multinational firm and show that only 22% of H-1B workers quit and move to other firms while still on H-1B.

[13] One such prominent lawsuit was against HCL (Hindustan Computer Ltd.) which operates both in India and the U.S. The lawsuit exposed that HCL had a corporate strategy to boost profits and pay H-1B immigrants hired mostly from India systematically lower than their U.S. counterparts.

Canada have access to TN visas and immigrants from Australia have access to E-3 visas and immigrants from Chile and Singapore have access to H-1B1 as an alternative visa. Each treaty creates different requirements and benefits, and, in some cases, these visas may be preferable to the H-1B. Not all the TN visas were enacted as a part of the NAFTA treaty in 1994, whereas H1-B visa was enacted as a part of the Free Trade Treaty with Singapore and Chile in the year 2003 and E-3 visas were enacted later in the year 2005 with as a part of the free trade treaty with Australia.[14]

The wages in the contract of H-1B immigrants is controversial. While Hunt (2010), Mithas and Lucas (2010) and others find that H-1B immigrants are paid more than the similar qualified natives, Matloff (2008) and Miano (2007) find that H-1B holders earn less than similar natives. Not only is there evidence on H-1B immigrants earning lower wages than natives there is also an increasing concern that since H-1B visas is concentrated from couple countries and the hiring monopolized by middlemen Consultancy Services the increased H-1B cap did not bring the best and brightest to the U.S. labor market particularly in the tech firms (Lowell 2001 and Lowell and Avato).[15] Arguing that the foreign education does not necessarily lead to useful skills in the U.S. and based on English-language tests of literacy, numeracy, and computer operations administered by the Program for International Assessment of Adult Competencies Richwine (2009) finds that among test-takers with at least a college education, U.S.-degree holders out-score foreign-educated immigrants by a wide margin. However, in a very careful study Bourveau (2019) using the payroll data for big accounting firms show that relative to U.S. citizens new hired accountants on H-1B visas matched on office, position as well as time of hire receive starting salaries that are lower by approximately 10%.

While there are debates about how to reform the H-1B Program and how to make it more effective for the firms and the U.S. population, this paper is the first to look at earnings of high skilled immigrants during the various H-1B cap periods. Some recent work using H-1B firm

[14] Immigrants from these countries can also enter on an H-1B visa but they have this alternative visa available and hence the binding periods are possibly not binding for them, or these countries are H-1B "cap exempt."
[15] See Hira (2005).

level lottery data show mixed findings on employment and profit at the firm level. Ghosh et al. 2016 show that the firms that are heavily dependent on H-1B visas will show increased productivity and profits whereas Mayda et al. (2023) also using H-1B lottery data show that firms that won H-1B lottery during the cap period significantly reduced the employment of new H-1B workers but there was no substitution by native workers and the H-1B visas were more concentrated in the computer sector. Doran et al. (2022) find that winning H-1B lottery at the firm level crowds out native employment significantly. Mahajan et al. (2024) show that the firms that won H-1B visa lottery showed increased H-1B immigrants' employment and only marginal displacement of native college graduate low tenure young workers but an increase in the hiring of non-college native worker.

Drago et al. (2015) in a careful narrative makes a case for that in the technology industry, H-1B workers' wage premium over natives has slowly eroded relative to domestic workers. Together with the increased H-1B concentrated from few countries like India and China, where most workers were brought as IT or Programmers often through middlemen agencies potentially leading to more adverse selection of immigrants in terms of their labor market abilities H-1B workers also cannot change employers easily and are often stuck at lower wages and are also not often to assimilate outside of their firm (Kumar et al. 2017).

3. Data, Trends and Descriptive Statistics

We use the pooled sample from the years 2003 2010, 2013, 2015 and 2017 from NSCG. This survey samples individuals who are living in the U. S. during the survey reference week, have at least a bachelor's degree in any academic disciplines, and are under the age of 76. [16] NSCG is a unique source for examining various characteristics of college-educated individuals, including occupation, salary, the three highest university degrees along with the majors, whether each degree was received in the U.S., the type of entry visa for immigrants and their current

[16] The National Survey of College Graduates is a repeated cross-sectional biennial survey that provides data on the nation's college graduates, with particular focus on those in the science and engineering fields. This is a well-represented survey of college graduates in the U.S. (National Science Foundation, 2020). https://www.nsf.gov/statistics/srvygrads/. The NSCG is sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF) and is collected by the U.S. Census Bureau.

residency status, and other detailed demographic and socio-economic information. Our sample includes only individuals who a) were employed during the survey reference week, b) reside in the U.S., and c) are 65 years of age or younger. NSCG does not collect data on the labor market experience of the immigrants in their home country as well as there is no information in which University the immigrants went to school in the home country. For immigrants who came to study in the U.S. their labor market experience is measured from the years when they graduated.

Hourly wage is derived for using annual salary, number of weeks worked per year, and number of hours worked per week. To omit outliers, we omitted individuals who earn less than the federal minimum wage or more than $300 per hour. U.S. skilled immigration policy exempts employers in higher education from H-1B caps. For this study, the academic sector includes "2-year college, junior college, or technical institute," "4-year college or university," "Medical school," "University research institute," and "Other (Educational Institution)," which is the same as "4-year universities and research centers." Cap Binding countries include Mexico, Canada, Singapore, Chile and United Kingdom.

3.1 Summary Statistics

Table 1 gives the weighted summary statistics for our sample and main variables based on the entry visa. We see that the average wage for immigrants who come on work visa is $51.33 whereas for immigrants who come on study visa is $48.61 and the difference is statistically significant. Most immigrants who come on work visa are male (68%), are married (85%) and have children (65%). For immigrants who come on study visa 64% are male, 76% are married and 59% have children. Naturalization among work visa entry immigrants is only 32%, whereas it is 54% for study visa entrants. As expected almost all work visa immigrants at (90%) work are in the industry and only 8% are in academic sector, whereas 18% of study visa immigrants are in academic sector and 75% are in business/industry. It is interesting to note that 20% of work visa

immigrants are from English speaking countries and only around 9% of study/training are from English speaking countries.[17]

Distribution of degrees varies across immigrants who entered on work visas and study visa show that 58% of work visa entry immigrants have a bachelor's degree, 32% have a MA degree and only 8% have Doctorate & Professional degree. Whereas for student and training visa entrants 46% have MA degree, 27% have Doctorate and professional degree and only 28% have bachelor's degree. If we look at the field of study for immigrants who first entered the U.S. on work visas the largest field of study is non-science and engineering at 29% whereas Computer & IT and Engineering each are second at 20%. For student visa entrants the highest field of study is also non-science and engineering at 33% followed by Engineering at 17% and Computer & IT at 13%. NSCG does not collect any data on immigrants' home country or any other country work experience, test scores or their home country university rankings.

3.2 Summary Statistics for Immigrants on Work and Study Visas

To examine the effect of H-1B cap changes on average hourly wages, we divide when immigrants came to the U.S. into five periods: 1. *before 1990* (when there was no H-1B visa program), 2. *1990 to 1996* (when the cap on H-1B visas was initially set at 65,000 visas annually and was non-binding), 3. *1997 to 2000* (when the cap on H-1B visas was increased to 115,000 visas annually and was binding), 4. *2001 to 2003* (when the cap on H-1B visas was increased again to 195,000 visas annually and was not binding), and 5. *2004 onwards* (when the cap on H-1B visas was reset at 65,000 visas annually with an additional 20,000 visas for immigrants with U.S. master's degrees or higher and the cap was binding, see Figure 1 panel C

In Table 2 we look at summary statistics for some important change in wages across different H-1B cap periods for immigrants on work visa entry and study visa entry. From panel A we find that the average hourly wage for immigrants who arrived on work visas during 1990-

[17] English speakers are born in Antigua-Barbuda, Australia, Bahamas, Barbados, Bermuda, Canada, Dominica, Grenada, Guyana, Ireland, Jamaica, Liberia, New Zealand, Northern Ireland, South Africa, St. Vincent, Trinidad and Tobago, and the United Kingdom (Borjas, 2015).

1996 and 1997-2000, when the cap was increased from 65,000 to 115,000 is the highest and an increased proportion are in Computer IT and Science and Engineering. Further, looking at the summary information for work visa immigrants who first entered U.S. during 2001-2003, when the cap was increased to the highest level at 195,000 and was not binding, we find that average wages dropped to $44 but share of immigrants with a bachelor's degree only increased to 61% and the share of non-science and engineering fields increased to 35.27%. The average wage of $53.26 during 1997-2000 is significantly higher than $44.12 during 2001-2003 and the summary statistics across different H-1B periods show some evidence of wage suppression, a rise in the non-science and engineering visa and increased hiring by middlemen staffing agencies.

For study visa entrants during the different periods, we see that average wages for immigrants who came during the 2001-2003 when the cap was not binding as well as 2004 onwards when the H-1B cap was reduced and binding is lower than the study visa immigrants who came earlier. Moreover, there is a higher share of master's who came during 2001 and 2003 and after 2003 when the additional MA visas were in place. We also see an increase in the share of Engineering (without Computer and IT) field of study among the study visa immigrants who came during the 2001-2003. From the data summary on immigrants an important difference between the work visa and study visa entrants is that while for work visa immigrants, average wage is lowered during non-binding period 2 from 2001-2003 and wages went back up for immigrants who arrived during and after 2004 when the cap for H-1B was lowered to 65,000 and was binding. But this is not the case for study visa immigrants. For study visa entry immigrants who came to the U.S. 2004 onwards when the H-1B cap was reduced to 65,000 and with additional 20,000 visa for Master s saw wages decrease by 8 percentage points onwards. This could possibly be due to visa scarcity with many study visa graduates joining academia and earning lower wages than in the industry (Amuedo-Dorantes and Furtado 2019).

These preliminary data statistics given in Table 2 supports our claims that for work visa entry during 2001 – 2003 when the cap was increased to 195,000, non-binding period 2, there was a substantial increase in college graduate's entry positions with majority work visa going to individuals who were using outsourcing firms like Tata Consultancy and Infosys for entry into the U.S. Simultaneously, with increased limits on H-1B possibly there was less positive

selection of immigrants from the home country skill distribution. However, this changed from 2004 onwards when the cap was drastically reduced to 65,000 and was binding and we see average wages go back up by 7 percentage points close to the average wages of immigrants who came on work visa before 1990. During the same period, we do not see this summary dynamics for student visa entrants.

3.3 Wage Trends for Immigrants on Work and Study Visa

Figures 2 Panel A and Panel B shows hourly wage trends relative to native wages over survey years for immigrants who came on work visa and study visa respectively. Using ln of wage and quadratic in age adjusted model, the trends show that work visa immigrants who came during the initial H-1B cap increase period of 1990 – 1996 (non-binding period 1) showed an upward trend even if the cap was not binding but that is not the case for work visa entrant immigrants during the 2001 – 2003 when cap was increased to 195,000, non-binding period 2. However, this is not the case for immigrants who came to the U.S. on study visa during the same period, their wages relative to natives during this period show an upward trend.

Focusing on the similar trends over survey years for immigrants in academia, (Figures 3 Panel A and Panel B), we see that for both work visa and study visa entry immigrants show upward trend relative to natives during 2001-2003, non-binding period 2. H-1B cap was not relevant for academic jobs. However, for non-academic jobs (Figure 4) we see a downward trend for work visa immigrants and an upwards trend for study visa immigrants if they entered the U.S. during the H-1B cap increase non-binding period 2. Similarly, in Figure 5, we see a downward trend for immigrants on work visa from cap bound countries relative to natives over survey years if they entered the U.S. during 2001-2003, but that is not the case for cap exempt countries in Figure 6. For immigrants on study visa from H-1B cap bound countries we don't see this downward trend either.

The trends and the descriptive statistics motivate to examine the role of the H-1B cap entry period on the earning of work visa immigrants as well as compare it to the student visa. We also

estimate academia and non-academia and the immigrants from cap bound and cap exempt countries.

4. Empirical Methodology

In this section we estimate two baseline models to examine the effect of H-1B cap changes on earnings while controlling for other individual and different geographical and time factors. Dependent variable in both the models is hourly wages and in the first model both immigrants and natives are included while in the second model only immigrants are included.

$$lnW_i = \beta_0 + \beta_1 * (Mig\ before\ 1990) + \beta_2 * (Mig\ 1990 - 996) + \beta_3 * (Mig\ 997 - 2000) + \beta_4 * (Mig\ 2001 - 2003) + \beta_5 * (Mig\ 2004\ and\ after) + \beta X + \delta_s + \delta_r + t + \varepsilon_i \qquad (1)$$

The first model given by equation (1) above estimates earnings of immigrants relative to natives (the base group). We estimate equation (1) for work visa and study visa entrants separately. To reiterate, the five H-1B cap periods are *before 1990 (*when there was no current H-1B Program*)*, *migration during 1999-2006* (cap was 65,000 and not binding, *non-binding period 1*), *migration during 1997-2000* (cap increased to 115,000 from 65,000 and was binding*, binding period 1*) and *migration during 2001 – 2003 (*when cap further increased to 195,000 and was not binding, *non-binding period 2)* and *2004 onwards* (when the cap was reduced back to 65,000 which was binding with an additional 20,000 visas for immigrants with MA degree, *binding period 2*). Vector X includes some combination of the following variables: highest degree, field of study, age, age squared, work experience, male and whether the individual is married, has children or not and whether the individual is from English speaking country or not. Immigrant work experience is their years of labor market experience in the U.S. only.[18] Detail employer sector (δ_s), employer region (δ_r) and survey year (t) fixed effects are included in the model, and we also control for race, employer size and whether the immigrant is self-employed.[19]

[18] NSCG has no information on the ranking of the foreign universities or the foreign experience of the workers who come on work visas.
[19] Almost 18% of work visa entrants are self-employed in our sample, see Table 1.

$$lnW_i = \beta_0 + \beta_1 * (Mig\ 1990 - 996) + \beta_2 * (Mig\ 1997 - 2000) + \beta_3 * (Mig\ 2001 - 2003)$$
$$+\beta_4 * (Mig\ 2004\ and\ after) + \beta_5 * Highest\ Deg\ U.S. + \beta X + \delta_s + \delta_r + t + \varepsilon_i \quad (2)$$

In the second baseline model given above we include only immigrants. In this model vector X is same as in equation (1) but we also include whether immigrants obtained their highest degree from the U.S. (*Highest Deg U.S.)* The base group in equation (2) is immigrants who entered U.S. before 1990, when there was no H-1B Program in place. We estimate this model for work visa entrants and for immigrants who entered on study/training visa separately.

For study visa entrants we estimate both the models given above in equations 1 & 2 for if the immigrants entered the country or graduated during the H-1B cap periods. Comparing work visa immigrants to study visa entrants who graduated during different H-1B cap periods will show some scarring and ghetto effect of H-1B immigrants in the labor market. Study visa immigrants even if they entered the country or the U.S. labor market during the same time period as work visa entrants, they may potentially face less scarring and ghetto effect because they have the schooling experience in the U.S. and are more assimilated and integrated with the U.S. labor market.

We estimate both equations 1 & 2 for individuals employed in academia and in the non-academic sector for the survey year as well as for cap exempt group and cap bound group of countries. Since H-1B caps are not relevant for academic jobs comparing how the earnings for work visa entrants compared across academia and non-academia will give some insight on how H-1B Program cap changes effected immigrants' earnings. Similarly, immigrants on work visa from cap exempt countries should not see adverse effect on earnings during the high cap non-binding periods. Since academia and cap exempt countries are not subjected to H-1B caps, we should not see the effect of the changes in H-1B cap rules on immigrants' earnings for these two groups.

5. Results

5.1 Earning of Immigrants Relative to Natives

Table 3 shows our results for the first model where we compare immigrants' wages to natives' wages based on when they entered the U.S. and whether they first came to the U.S. on work visas or study visas. We see from Table 3 (col 4) after controlling for all factors and field of education immigrants with college degree who arrived on work visa before 1990 had no significant difference in their earnings compared to natives. But after H-1B Visa Program was in place and in the initial cap period of 65,000 for the non-binding period 1, 1990 – 1996, immigrants earn 17.2% higher than natives and this stays around 18.6% for immigrants who arrived on work visas during 1997 – 2000 when the cap was increased to 115,000 but was still binding. Though, we see that during the non-binding period 2 of 2001 – 2003 immigrants who arrived on work visa lost their premium compared to natives the earning difference between immigrants and natives drops to 7.5% (standard error 0.052) and statistically insignificant. From 2004 onwards when the cap was drastically reduced back to 65,000 and was binding, we find that work visa immigrants who entered the U.S. during this period again earn a premium- their wages are 30% higher and significant than the natives.

Col 6 in Table 3 gives the results for immigrants with student visas who graduated during the H-1B cap period. There is statistically insignificant difference during all the H-1B cap periods. Only after 2004 binding H-1B cap immigrants who entered on student visas earn 9.6% higher wages then natives at a 5% significance level. We also estimated model (1) for study and training visa immigrants who entered during the five H-1B cap periods and found that only during the two binding periods of 1997 – 2000 and 2004 onwards study visas entrants earn significantly higher wages than natives, 9.2% higher (significant at 5%) and 8.2% higher (standard error 0.046) and is significant at 10% compared to natives (see col 8).

The above findings show that the wage premium of work visa immigrants shrinks if they first entered the U.S. during the H-1B non-binding cap increase, particularly during 2001 – 2003 when the H-1B cap was increased to 195,000. This could possibly be due to the nature of many

H-1B employment hires including monopsony power and wage suppression and simultaneously due to some less positive selection of immigrants who are migrating to the U.S. with work visa during this period. We also see that immigrants who came on study/training visas during the same period also show declining wage premiums relative to natives (col 8). So, using this pooled model across several survey years of NSCG we do see some indication of declining wage premiums for work visa immigrants who entered during the H-1B cap increase non-binding periods which is not seen for study training visa entrants based on their year of graduation (col 6). Though, once the H-1B cap was dropped and binding we see significant wage premium for work visa entrants as well as for the study visa group.

All other demographic and human capital variables have the expected sign. In all our models we control for survey year, employment sector and employer region. As expected, the coefficient on male, married and individuals with children is positive and significant. With experience, earning increased but at a decreasing rate and individuals with graduate and professional degrees earn more than college graduates. For field of study, immigrants on all entry visa types who work in computer and IT as well as in engineering (without computer and IT) earn significantly more than non-science & engineering field of study. Immigrants who work in biology, agricultural and environmental fields earn significantly less than the non-science and engineering fields. category (our base group for the field of study). Immigrants in government and business earn significantly more than the education sector.

5.2 Earning of Immigrants Relative to pre-1990 Immigrant Cohort

We next estimate equation (2) for our immigrant sample. We particularly compare wages of immigrants who entered during various H-1B cap binding and non-binding periods to immigrants who came before 1990. Results are given in Table 4. In col 6 of Table 4, we report results with all the controls, including country of origin fixed effects, and find that for immigrants who entered on work visas during various H-1B cap periods do not earn significantly different than the earlier cohorts who entered first before 1990. However, that is not the case for immigrants who came to the U.S. during the non-binding cap period of 2001-2003. Work visa immigrants who came during this high non-binding cap period have average hourly wages 20%

lower than immigrants who came before 1990 (standard error 0.069) and this difference is highly significant (col 6).

We performed a similar analysis for immigrants who entered on study/training visas and graduated during the H-1B cap change periods. Results are given in Table 4 (cols 7-12). Focusing on col (9) we find that there is no significant wage difference among immigrants who entered U.S. on study visa and graduated during the H-1B cap change periods with the earlier cohorts. From col (12) we find that for study/training visa groups who entered U.S. during the various H-1B cap periods, immigrants who came during 1990 – 1996 (the first non-binding period) earn 8.1% less than immigrants who came before 1990 and this is significant only at 5%. However, study visa immigrants who came during and after 2004 earned 15.7% less than the ones who came before 1990 and this is significant at 1%. We do not find this earning drop when we group our student visas by the year they graduated. Col 9 shows that there is a possibility that the drastic reduction in H-1B quotas, which is binding, may lower the quality of the international students entering on student visa (Kato & Sparber 2013).

Our takeaway from Table 4 is that when we compare immigrants who came on work visa with earlier work visa cohorts, we find that immigrants who arrived during the increased cap non-binding H-1B cap 2001-2003 have significantly lower wages than the immigrants who arrived before 1990 though we do not find this for study visa immigrants. This could possibly be due to the process of hiring H-1B college educated workers at entry level jobs, through outsourcing firms which controlled most of the H-1B employment, as well as reflect the lower skills of work visa immigrants who entered during this period as well as wage suppression for H-1B visa entrants.

5.3 Academic and Non-Academic Sector

Academic jobs and immigrants from five countries were exempted from H-1B caps.[20] In the next section we estimate the models for both work visas and study visas for the academic and the

[20] Five countries are Mexico, Canada, Singapore, Chile and Australia.

cap exempt group and compare them to the non-academic and cap bound groups, respectively. We expect that our findings from Table 3 and Table 4 will not hold for either the cap exempt groups or the high skilled immigrants' groups which are not affected by the H-1B cap Program. For the ease of exposition and given the findings in Tables 3 and 4 we combine the two H-1B cap binding periods of 1997-2003 and 2004 for all further the subgroup analysis in the paper.

To further see how wages for work visas and study visas compare during the H-1B cap change period we estimate our equations (1) and (2) for the academic and non-academic sectors. College university and some research jobs (academic sector) are not bound by H-1B caps and have a more transparent hiring process without middlemen outsourcing agencies, so we expect to see no significant effect of H-1B cap changes on wages in the academic sector for both work visas and study visas. In the non-Academic sector, where the H-1B cap changes are relevant and where work visas are concentrated, (particularly in Computer and IT and engineering jobs being controlled by outsourcing firms such as Tata Consultancy and Infosys), we expect to find the impact of H-1B cap changes on earnings.

Given the findings in Tables 3 and 4 we combine the two H-1B cap binding periods of 1997-2000 and 2004 onwards. Panel A in Tables 5 and 6 gives the estimation of equation (1), for immigrant wages relative to natives and for the academic and Non-academic sample. All controls and the estimates of their effects are similar to that in Table 3 and hence we do not report it in these Tables. From col 4 in Table 5 Panel A, we find that immigrants who came on work visa and were employed in the academic sector earn 19.4% higher than the natives if they arrived before 1990 and they earn 14.9% more than natives during the binding periods, though this is significant at 10% only. In all other H-1B cap periods there is no significant difference between natives and work visa entry immigrant earnings in academia where H-1B caps are not effective. We do not see any significant difference in study visa immigrant wages relative to natives during all the H-1B cap periods, both by year of graduation and year of entry. We only find in col 6 that study visa immigrants who graduated before 1990 earned 10.6% more than similar natives. In this analysis the findings of work visa immigrants are less robust than the study visa immigrants because of small sample size of work visa immigrants who are employed in Academia. In our pooled sample in Table 5 Panel A, there are only 664 work visa immigrants

who are employed in academia versus 30,731 natives. H-1B cap changes generally do not have significant wage differences for immigrants versus natives.

Panel A in table 6 focusses on immigrants who entered on work visa and are employed in non-academic sector. In col 4 we find that for immigrants who entered during the first non-binding period (1990 – 1996), when the H-1B cap increased from 65,000 to 115,000, immigrants earned on an average 17.8 % more than natives. However, during the second non-binding period of 2001 – 2003 when the cap was increased to 195,000, immigrants had no significant earning premium compared to the natives. During and after 2004, when the H-1B cap was drastically reduced back to 65,000 and was binding, immigrants on work visas in non-academic sector earned 25.5% more than the natives. We find that immigrants who first entered on study visa and graduated during 2001-2003 earn 7.7% higher than the natives at 10% significance level. However, we do not find any significant earning premium for study visa immigrants who entered the U.S during 2001-2003, but if they entered the U.S. during the 1997-2000 or 2004 onwards (the two-binding periods) they earn significantly higher than the natives at 11.6% (see col 8 Table 6).

Next, we estimate equation (2) for immigrants who are employed in academia and non-academia during the survey years. Results are given in Table 6 Panel B for academia and, in Table 6 Panel B for non-academic group. In the academic sector, we find that for work entry immigrants there is no significant earning difference between those who entered during various H-1B cap periods and those who came before 1990. The same is true for study visa entry immigrants, whether compared by year of graduation or year of immigration. Given there are fewer work visa entrants in the academic sector, but we also find similar results for study visa entry immigrants working in academia. In the academic sector, where employers are exempted from H-1B policies and not subjected to the H-1B caps, we do not see the deterioration in earnings of immigrants relative to earlier cohorts.

For the non-academic sector from Table 6 Panel B, our findings are different from the academic sector. Similar, to all group on work visa entry in Table 4 we find that immigrants who entered on work visa during 2001-2003, when the H-1B cap increased and was non-binding

earned 16.9 % (standard error 0.06) less than earlier work visa cohorts who came before 1990. For all other entry periods there was no significant earning difference between the immigrant groups from the earlier cohorts. During and after 2004 entrants' hourly wages were not significantly different from the earlier cohort. For study/training visa entrants based on the year of graduation there is no significant difference between various immigrant cohorts compared to the earlier cohort before 1990.

In summary the academic and non-academic analysis shows that for immigrants employed in non-academia who enter on work visas during 1999-2000 earned more than natives and this premium relative to natives was lost during the 2001-2003 high H-1B cap non-binding period. The premium drop may be related to possible lower selection and non-competitive hiring of high skill foreign employees. As well as monopsony hiring and wage suppression particularly by the outsourcing middlemen hiring firms. Comparing immigrants to earlier cohorts we find that for work visa immigrants in non-academia sector entrants during 2001-2003 earn 16.9% less than immigrants who came on work visa to the U.S before 1990. This was not seen for academic sector because H-1B cap was not relevant for those jobs.

5.4 H-1B Cap Bound and H-1B Cap Exempt Countries

Most highly skilled immigrants in the U.S. come from H-1B cap bound countries. In our sample around 85% of immigrants entered the U.S. on work visas and almost 95% on student visas from H-1B Cap bound countries. We examine the earnings of immigrants relative to natives in Table 7 restricting only to college and MA degree, since that group constitutes 80% of our immigrant sample. Immigrants who enter on work visa earn around 21% (standard error 0.052) more than natives if they came during 1990-996 and further increases to 28% (standard error 0.050) during the binding periods. See Table 7 Panel A. However, work visa entrants during the second non-binding period of 2001-2003 drops to only 13.2 % (standard error 0.056) more than natives and is significant at 5%. For cap exempt countries in Table 8, we do not see these dynamics in the immigrant premium relative to natives (Panel A). For the first non-binding

period of 1990-1996 we see that the immigrants have a 22% premium (standard error 0.014) and for the cap binding periods immigrants also show 26.7% higher earnings (standard error 0.033) on an average compared to natives and for the second non-binding period there is no significant difference compared to the natives. During the combined binding cap periods as well as during initial periods after the H-1B work program was in place the demand for highly skilled immigrants was high in the U.S. and immigrants from cap exempt countries could possibly satisfy this demand at high premiums in the highly skilled labor market in the U.S.

For student visa we do not see any such dynamics through the different cap periods. Immigrants entering U.S. on student visa from cap bound and exempt countries show significant premium post 2004. This again shows that not only whether the H1B cap is binding or not binding but also the process of H-1B hiring including the middlemen agencies as well as immigrant scarring involved plays a role in earning outcomes for work visa entrants and not relevant for immigrants who are admitted to the U.S. universities on student visa and have a U.S. degree.

Panel B in Tables 7 & 8 report our findings for immigrant only sample. For immigrants who first entered on work visas from cap exempt countries we find significant difference in their earnings compared to immigrants who entered before 1990 (Table 8, Panel B). However, for cap bound countries we find that immigrants who came on work visas during the non-binding period 1 earned 6.7% less (standard error 0.034) significant at 10%, than the immigrants who came during early period of H-1B of 1990 – 1996 (Table 7 Panel B). For student visa entrants there is no significant difference in the earnings across H1B cap periods for both cap exempt, and cap bound countries compared to immigrants who came during 1990-1996. This shows that in all immigrants' sample whether the H1B is binding or non-binding, and the hiring policies does have a significant adverse effect on immigrants' earnings for cap bound countries which is not seen for cap exempt as well as for student visa entrants where the admission and the selection process of entry are different.

Tables 1A and 2A in the appendix gives results for all immigrants including immigrants with doctorate and professional degrees, which roughly constitutes 20% the sample for both cap

bound and cap exempt countries. For cap bound countries the results for Panels A and B are similar to that of the sample with only college and MA degree holders in Table 7. But for the full sample for five cap exempt countries, we find that immigrants on work visa during the non-binding period of 2001-2003 earn around 15% less than natives and 23% less than work visa entrants of non-binding period 1 (1990-1996). This could possibly be because during the non-binding period 2 there is greater supply of immigrants from cap bound countries such as India and China, who are possibly substituting the hiring of the work visa immigrants from cap exempt countries and so the demand for these work visa immigrants will drop their average income.

5.4 Heterogenous Effects across Field of Study

From Table 2 we see that post H-1B share of work visa immigrants in computer and IT has increased to 26% in the first binding period of 1997 – 2000 but dropped to 9.47 % during 2001-2003 and increased to 27.30 % post 2004. Whereas the non-science and engineering category of work visa entrants' field varies between 22.64 during period 1 and increased to 35.27 during 2001-2003. So, the NSCG sample from various years shows that non-science and engineering is a significant share of the field for work visa immigrants.

If we compare the earnings of immigrants who entered the U.S. on work visas and have a degree in Computer or IT versus non-science and engineering, we see interesting differences. From Table 9 Panel A immigrants who first enter on work visa with a degree in computer or IT earn 22 – 30% higher and significant, whereas from Panel B for immigrant only sample for work visa entrant earn significant less than pre 1990 cohort during the cap binding period. However, it is the work visa immigrants with a degree in non-science and engineering in Table 10 where we see the premium relative to natives drop, particularly in the second non-binding period where the outsourcing of hiring of H-1B immigrants was rampant. As shown by the recent Bloomberg report on H-1B hiring from Citibank and Capital One that during 2000 – 2004 majority of hirings were done through H-1B visas not in high skilled workers but for IT and other staffing needs

primarily through middlemen staffing agencies.[21] The findings from non-science & engineering is similar to the baseline results. During the non-binding period, there was less selection and more monopsony power by the firms in hiring and during this period majority of H-1B workers were hired through the outsourcing firms. This is not seen for study visa entrants based on their year of migration for both computer & IT as well as non-science and engineering.

5.5 Identification

i. Heterogenous entry period effect and native trends

The econometric challenge with our baseline model in equation 1 is that we assume that natives' trends of wages have stayed the same throughout the NSCG sample periods and is captured by the intercept and the survey period effect. Moreover, this does not allow different time trends for natives and immigrants during the survey year, and the model could have identification issues and biased coefficients. First, we estimate equation 1 for natives only. Results are given in Appendix Table 3A. We find that after including all the controls hourly wages for natives who graduated in 2001-2003 is 7.3% higher and those who graduated during and after 2004 is 4.5% higher compared to those who graduated before 1990. For natives in academia and non-academia who graduated in the year in the year 2001 – 2003 earned 9% and 7% higher respectively, than natives who graduated before 1990. The magnitude of the changes in native wage trends over the survey years are relatively smaller than our coefficients in Table 3 for immigrants' wage relative to natives. Hence our findings in Table 3 holds. Second, we also estimate models with various entry period of H-1B cap is interacted with the survey year to test whether the different period of entry for H-1B has any differential trends during survey year. Joint test fails to reject the null of no heterogeneity across the H-1B entry period for the survey years. Hence our baseline findings in Table 3 and Table 4 holds.

[21] https://www.bloomberg.com/graphics/2025-h1b-visa-middlemen-cheap-labor-for-us-banks/?embedded-checkout=true

(ii) Selection Based on Ability:

We do not have information on the ability of the work visa immigrants other than their education level, since NSCG does not collect data on the immigrant's test scores, ranking of their home country institution and work experience in home or any other foreign country. It is important to consider whether the effect of the H1-B cap period on earnings is influenced by the omission of the immigrants' ability. To address this, we proxy workers abilities by their parents' education and include both mother's and father's education in the baseline model and the results are given in Appendix Table 4A. During the cap binding period immigrants on work visa show significant earning premium of 26% compared to natives. As well as significant 17% during the first non-binding period but drops to 9% during the second non-binding period. This is similar to our baseline findings in Table 3.

(iii) *Home Country Wage Structure- Case of college graduates in India:*

There is a possibility that the workers selected on H-1B visas are dictated by changes in the wage structure in their home countries. We examine this using some aggregate changes in the college graduates wage structure and employment changes in India, since roughly 70% of H-1B visa immigrants are from India. There has been steady excess supply of secondary and tertiary educated workers in India and wage premium for college educated group has been increasing during the 90s and wage premium for college educated group or tertiary education has been decreasing post 2004 primarily due to a decrease in the quality of the workforce in India in higher education groups (Khurana and Mahajan 2020). These trends are for all over India, and we only find changes in earnings for tertiary educated workers entering U.S. on H-1B visas but we do not see this for immigrants entering on student visas. This supports that the process of H-1B selection is playing a significant role in earning dynamics of the workers who entered the U.S. on work visas rather than the home country wage stricture, since we do not see the same dynamics for student visa entrants where the selection is driven by the University and the general field criteria in the admission process.

5.6 Robustness

(i) Timing of the H-1B cap

Department of Homeland Security calendar year starts in October in the previous year and so there is a possibility that the H-1B cap periods could potentially affect the immigrant's entry decisions a year before than the H-1B cap announcement. We estimate the models in Table 3 for work visa and student visa entrant (based on the year of entry) by adjusting the H-1B cap periods by a one-year lag and our findings given in Table 4B (Panel A) in the Appendix are similar to the main results. We find again that during the non-binding periods of peak hiring by middlemen agencies of H-1B visa entrants earnings drop significantly for H-1B entry immigrants but not for student visa entrants. A recent Bloomberg report shows that businesses such as Citibank and Capital One used H-1B visas to hire workers at lower pay and it was at peak during 2000 – 2004.

(ii) Leaving out India and China

To test whether the earning changes for the work visa entrants is driven by the two largest group who enter on H-1B work visas, Indians and Chinese, we re-estimate our baseline model after dropping the two groups. Results are given in Table 4B panel B and we see that similar dynamics is seen which we saw in Table 3 for the whole sample for both work visa and student visa entrants. Though, we do not see a significant drop in work visa entrants during the second non-binding period.

6 Conclusion

Our paper is the first detailed analysis on the earnings of high skilled immigrants using national college graduate sample over the years 2003, 2010, 2013, 2015 and 2017. U.S. firms often face shortages of skilled workers and to sustain economic growth and innovation in the U.S. there is a huge demand for high skilled workers. Currently, there is a discussion on reforming the H-1B system.[22] Recent papers

[22] DHS announcement on Dec 17, 2024. https://www.uscis.gov/newsroom/stakeholder-messages/dhs-announces-h-1b-modernization-final-rule-to-improve-program-integrity-and-efficiency as well as recent announcement of H-1B fees.

show the impact of the H-1B lottery on the firms' profits and hiring of immigrant and native workers at the firm level.

In this paper we estimate earnings of immigrants who first entered U.S. on work visa during different H-1B cap periods and compare it to the natives as well as immigrants who came before 1990; potentially showing some selection dynamics of the immigrants as well as the hiring practices and monopsony power by the few employers. Also, how work visa entrants' earnings compare to similar high skilled workers but who come in the U.S. on student visa and this comparison may show the effect of scarring of the immigrants because they were hired by middlemen staffing firms and did not go to school in the U.S.

College, university and some research jobs (academic sector) and five countries Mexico, Canada, Singapore, Chile and Australia were not bound by the H-1B cap during different periods in our analysis. We compare work visa immigrants in non-academia versus academia as well as cap bound and cap exempt countries. In the non-academic sector we find that immigrants who entered during 1990 – 1996 the first non-binding period when the cap was still 65,000 and then raised to 115,000 immigrants earned on an average 17.8 % more than natives but during the second non-binding period of 2001 – 2003 when the cap was drastically increased to 195,000 immigrants had no significant premium in earning compared to the natives. This is not seen for the academic sector. With an increase in H-1B cap and the cap not binding there is a possibility that many immigrants who came on work visa are less positively selected and H-1B workers are tied to their employers, the immigrant groups who come on H-1B often face wage penalty compared to natives and often employers pay them substantially less than natives for the same jobs. Also, immigrants who come on work visa often face immigrant scarring in their earning and job prospects which might not exist if they come on student visa and get a U.S. degree. For cap bound countries, including India and China, we see that immigrants earn around 15% more than natives if they came before 1990 which increases to 21% during the first non-binding H-1B period of 1990 – 1996 and is as high as 28% during the cap binding periods. Also, we find that during increased H-1B hiring and wage suppression practices by the firms was also a period of increased non-science and engineering visas.

This paper will not only add to the literature of immigrant assimilation, particularly the role of the H-1B cap policy changes on the earnings dynamics of immigrants compared to the immigrants who came before the present H-1B immigration system was in place as well as compared to college natives who graduated during this period. But importantly it also shows that workers on H-1B visas face wage suppression and are tied to their employers with low job mobility and no path to obtaining Green Card and labor mobility. They often might not be the most skilled workers from their home country and are

hired by middle staffing agencies in lower ranked IT jobs and instead of a common perception that they are all on computer and engineering visas there is an increase in non-science and engineering visas.

High skilled immigration has been an important driving force for economic growth in the U.S. H-1B reforms in more transparency in hiring process, paying immigrants fair market wages and more realistic caps and less wait in obtaining green cards will enable U.S. to keep their trained and experienced workers. These reforms and better oversight of payments to H-1B workers and the jobs and responsibilities they undertake will allow U.S. to attract best and brightest workers from other countries which si important for U.S. to stay competitive in hiring foreign skilled workers.

References

Amuedo-Dorantes, C. and D. Furtado. 2019. "Settling for Academia? H-1B Visas and the Career Choices of International Students in the United States." *Journal of Human Resources*, 54 (2):401–429.

Borjas, G. 1985. "Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants." *Journal of Labor Economics*, 3.

_____1987. "Self-Selection and the Earnings of Immigrants." *American Economic Review*, 77(4), 531-553.

_____ 1995. "Assimilation and Changes in Cohort Quality Revisited: What Happened to Immigrants Earnings in the 1980s?." *Journal of Labor Economics*, 13:201-245.

_____2007 Do Foreign Students Crowd Out Native Students from Graduate Programs? In Stephan, Paula E. and Ronald G. Ehrenberg (eds.) *Science and the University* (Science and Technology in Society). University of Wisconsin Press, 2007.

_____ 2015. The Slowdown in the Economic Assimilation of Immigrants: Aging and Cohort Effects Revisited Again. *Journal of Human Capital,* 9(41): 483-517.

Bound J., G. Khanna and N. Morales 2017, "Understanding the Economic Impact of the H-B Program on the U.S.," NBER Working pape*r 23153*

Bourveau, T., Derrald S., H. Stice and R. White 2019. "H-1B Visas and wages in Accounting: Evidence from Deloitte's Payroll." Mimeo, Columbia University Business School.

Chakraborty S., D. Kapur, and N. Singh 2017. *The Other One Percent Indians in America*, Oxford University Press.

Chiquiar, and G. Hanson 2005. "International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States." *Journal of Political Economy*, 113(2): 239-281.

Clemens, Michael A. 2013. "Why Do Programmers Earn More in Houston Than Hyderabad? Evidence from Randomized Processing of US Visas." *American Economic Review Papers & Proceedings* 103(3):198–202.

Czaika, Mathias and Christopher R. Parsons 2017. "The Gravity of High Skilled Immigration," *Demography* 54(2): 603-630.

Doran, Kirk, Alexander Gelber, and Adam Isen. 2016. "The Effects of High-Skilled Immigration Policy on Firms: Evidence from H-1B Visa Lotteries." *Journal of Political Economy*, 130(10), 2501-2533.

2011 U.S. Government Office of Accountability Congressional Committee Report 2011. *H-1B Visa Program Reforms are Needed to Minimize the Risk and Costs of Current Program.*

Fan, E. and M. Patino 2025, H-1B Middlemen Bring Cheap Labor to Citi Capital One, https://www.bloomberg.com/graphics/2025-h1b-visa-middlemen-cheap-labor-for-us-banks/?embedded-checkout=true

Ghosh, Anirban, Anna Maria Mayda, and Francesc Ortega. 2014. "The Impact of Skilled Foreign Workers on Firms: An Investigation of Publicly Traded U.S. Firms." IZA Discussion Paper 8684. Bonn, Germany: Institute for the Study of Labor (IZA).

Hira, R. 2015. *New Data Show How Firms Like Infosys and Tata Abuse the H-1B Program*. Working Economics Blog. Economic Policy Institute.

———. 2016. *Congressional Testimony: The Impact of High-Skilled Immigration on U.S. Workers*. Congressional Testimony. Economic Policy Institute.

Hunt, J., and M. Gauthier-Loiselle. 2010. "How Much Does Immigration Boost Innovation?." *American Economic Journal: Macroeconomics* 2 (2): 31–56.

Kapur, Devesh, and John McHale. 2005. "Give Us Your Best and Brightest: The Global Hunt for Talent and Its Impact on the Developing World." Centre for Global Development.

Kato, Tako and Chad Sparber 2013. Caps and Quality: The Effect of H-1B Visa Restrictions on the Pool of Prospective Undergraduate Students from Abroad." *The Review of Economics and Statistics 95(1): 109-26.*

Kennedy, A. 2019. "The Politics of Skilled Immigration: Explaining the Ups and Downs of the US H-1B Visa Program." *The International Migration Review*, 53(2) 346-370.

Kerr, S. P., W. R. Kerr, and W. F. Lincoln. 2015. "Skilled Immigration and the Employment Structures of U.S. Firms." *Journal of Labor Economics* 33 (S1): S147–S186.

Kerr, W. R., and W. F. Lincoln. 2010. The supply side of innovation: H-1B visa reforms and US ethnic invention. *Journal of Labor Economics* 28 (3): 473–508.

Kerr, S. P., W. R. Kerr, C. Ozden, and C. Parsons 2016. "Global Talent Flows." *Journal of Economic Perspectives*, 30(4): 83-106.

Khurana, S. and K. Mahajan 2020. "Evolution of Wage Inequality in India (1983-2017) The role of occupational task content." WIDER Working Paper 167.

Kumar M. S., R. K. Kozhikode and M. Lazarova, 2017. "Socio-Cultural Adaptability and Immigrant Career Progression: A Paradox of Embeddedness," Academy of Management Annual Meeting Proceedings.

Lee, H. 2016. "Quantitative Impact of Reducing Barriers to Skilled Labor Immigration: The Case of the US H-1B Visa," Working Paper.

Mahajan P., N. Morales, K. Shih, M. Chen and A. Brinatti 2024 "The Impact of Immigration on Firms and Workers: Insights from the H-1B lottery." IZA Discussion paper No. 16917.

Mayda, A., F. Ortega, G. Perri, K. Shih and C. Sparber 2023 "Coping with H-1B Shortages: Firm Performance and Mitigation Strategies." ILR Review 2023

Matloff, N. 2008 "On the Need for Reform of the H-1B non-immigrant work visa in computer related occupations." *University of Michigan Journal of Law Reform* 36 (4): 815–915

———. 2013. "Immigration and the tech industry: As a Labour shortage remedy, for innovation, or for cost savings?." *Migration Letters* 10 (2): 210–227.

Miano, J. 2005. *The Bottom of the Pay Scale: Wages for H-1B Computer Programmers*. Washington, DC: Center for Immigration Studies.

———. 2007. *Low salaries for low skills: Wages and skill levels for H-1B computer workers, 2005*. Center for Immigration Studies.

Mithas, S., and H. C. Lucas. 2010. "Are Foreign IT Workers Cheaper? U.S. Visa Policies and Compensation of Information Technology Professionals." *Management Science* 56 (5): 745–765.

Morales, N. 2025. "High-skill Migration, Multinational Companies, and the Location of Economic Activity," *Review of Economics and Statistics*, 107(4): 982-986.

Olson E. 2004. "Congress Raises Limit on Skilled-Work Visas." *International Herald Tribune*, November 24.

Onteviros, M. L. H-1B Visas 2017, Outsourcing and Body Shops: A Continuum of Exploitation for High Tech Workers, *Berkeley Journal of Employment & Labor Law*, 38(1).

Peri, G., K. Shih, and C. Sparber. 2015. "STEM Workers, H-1B Visas, and Productivity in US Cities." *Journal of Labor Economics* 33 (S1): S225–S255.

Peri, G., and C. Sparber. 2011. "Highly Educated Immigrants and Native Occupational Choice." *Industrial Relations: A Journal of Economy and Society* 50 (3): 385–411.

Rivera-Batiz, F. L. (2007). "How do Immigrants from Latin America and the Caribbean Fare in the U.S. Labor Market." *World Economy*, 30, 1399-1429.

Richwine, J. 2009 “Foreign-Educated Immigrants Are Less Skilled than U.S. Degree Holders.” Center for Immigration Studies Report.

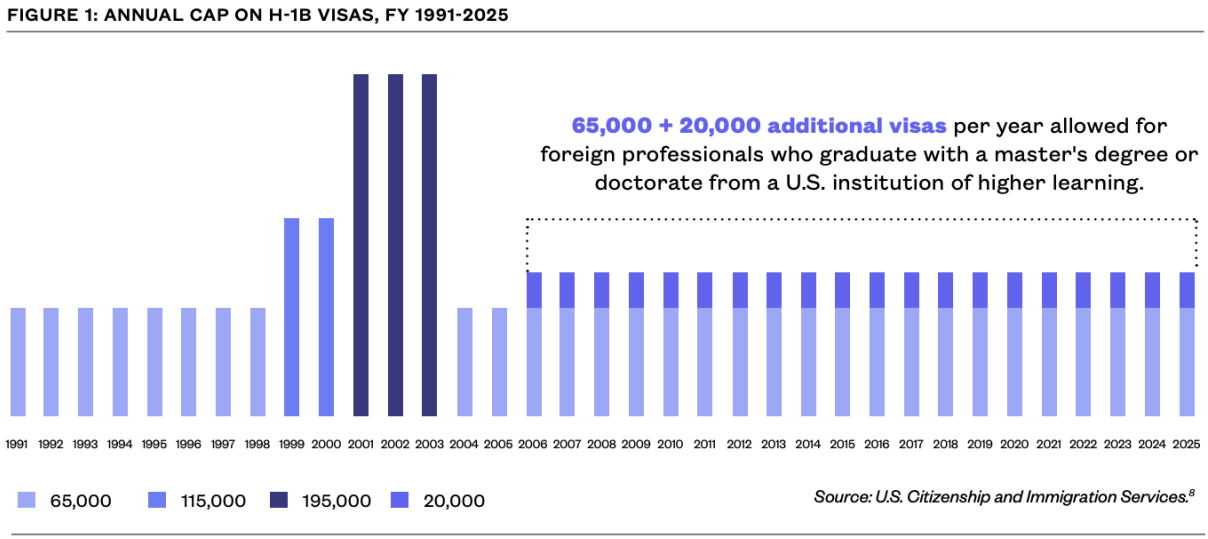
Shih, Kevin. 2016. “Labor Market Openness, H-1B Visa Policy, and the Scale of International Student Enrollment in the United States.” *Economic Inquiry*, 54(1): 121–138.

Stuen, Eric T., Ahmed Mushfiq Mobarak, and Keith E. Maskus. 2012. “Skilled immigration and innovation: Evidence from enrollment fluctuations in U.S. doctoral programs.” *The Economic Journal*, 122(565), 1143-1176.

Zavodny M. 2020. “The Impact of H-1B Visa Holders on the U.S. Workforce.” NFAP Policy Brief.

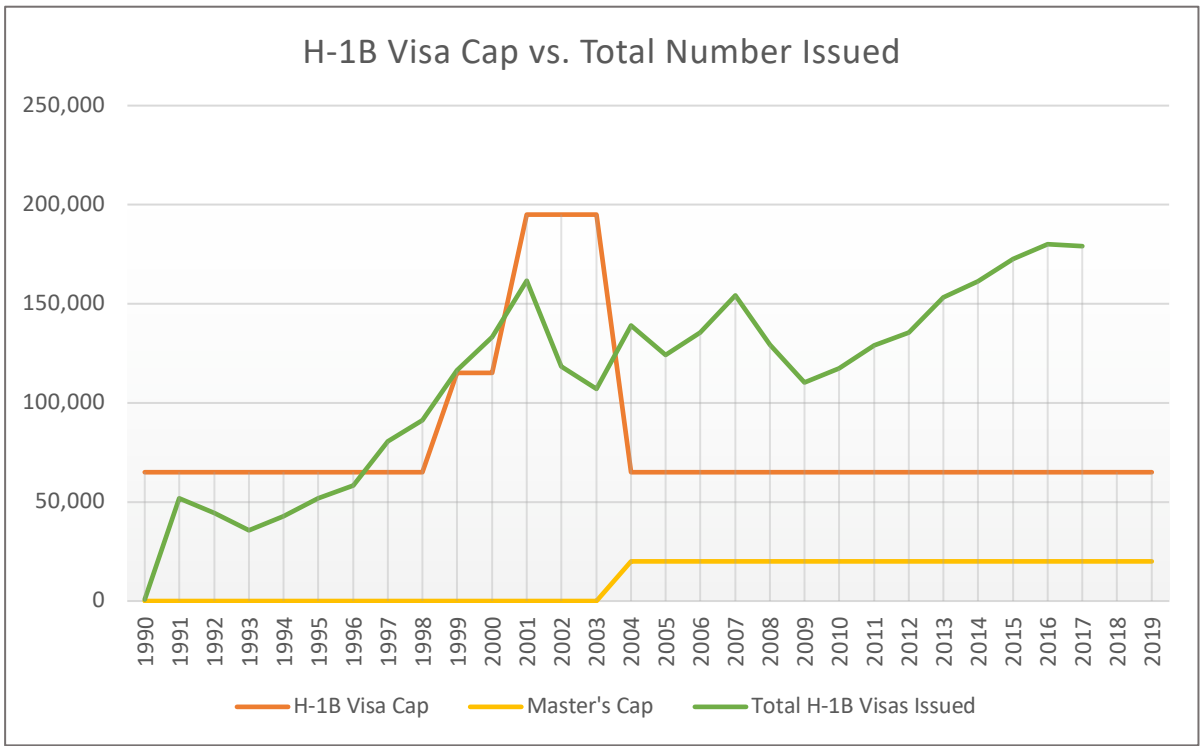
Fig 1: H-1B Visa Cap, Number of H-1B visas issued and Period of H-1B entry

Panel A



Source: The H-1B Visa Program and Its Impact on the U.S. Economy, Factsheet January 2025 American Immigration Council

Panel B



Source: USCIS

Panel C: Different H-1B Cap Entry period

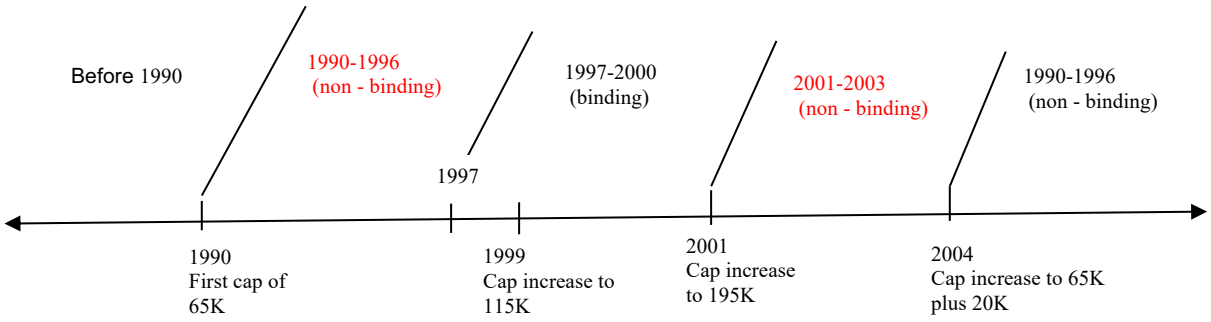
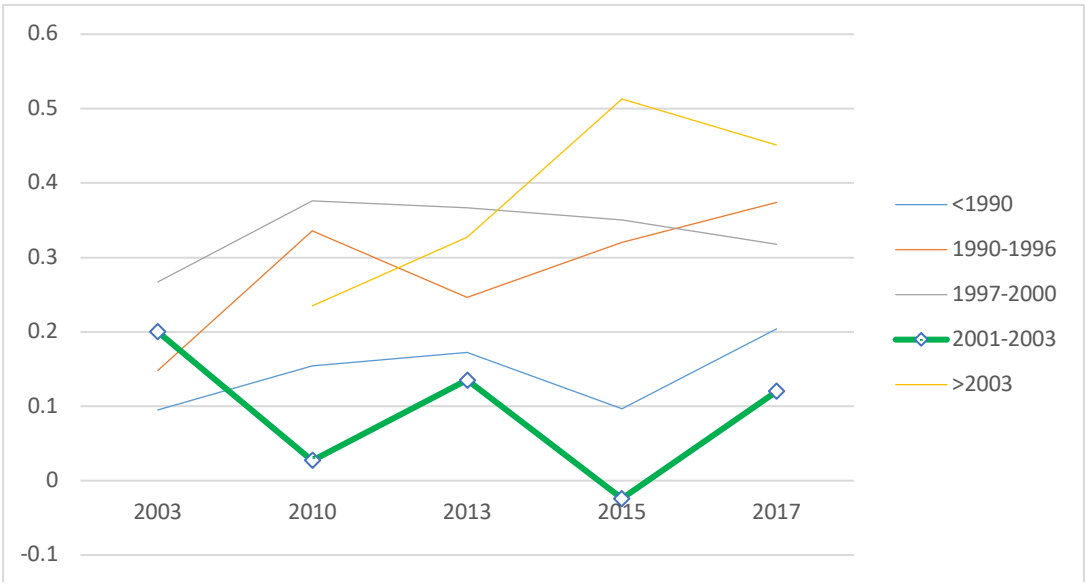


Figure 2: Age Adjusted Wage Trends Relative to Natives over Survey Year: Across Immigrant Entry Periods

Work Visa Entry



Study Visa Entry

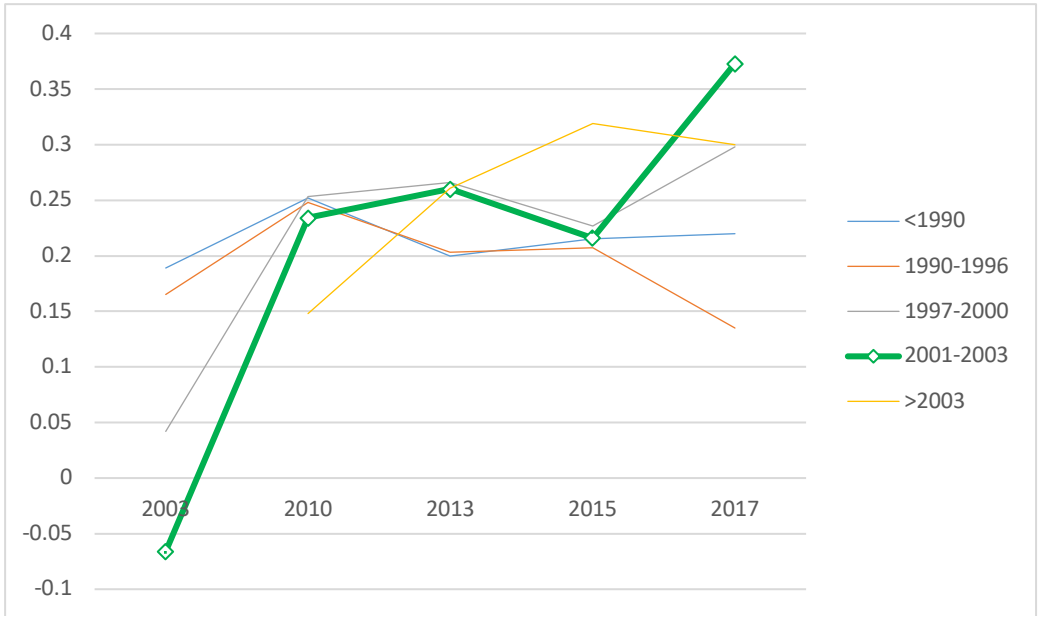
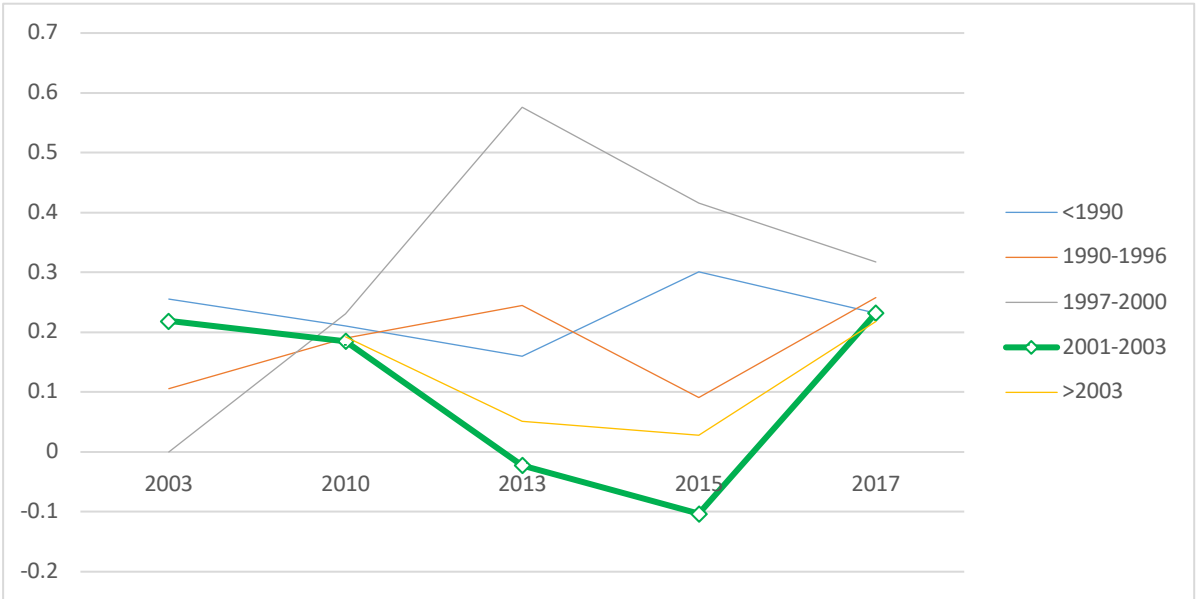


Figure 3: Age Adjusted Trends Relative to Natives over Survey Year for Academia: Across Immigrant Entry Periods

Work Visa Immigrants



Study Visa Immigrants

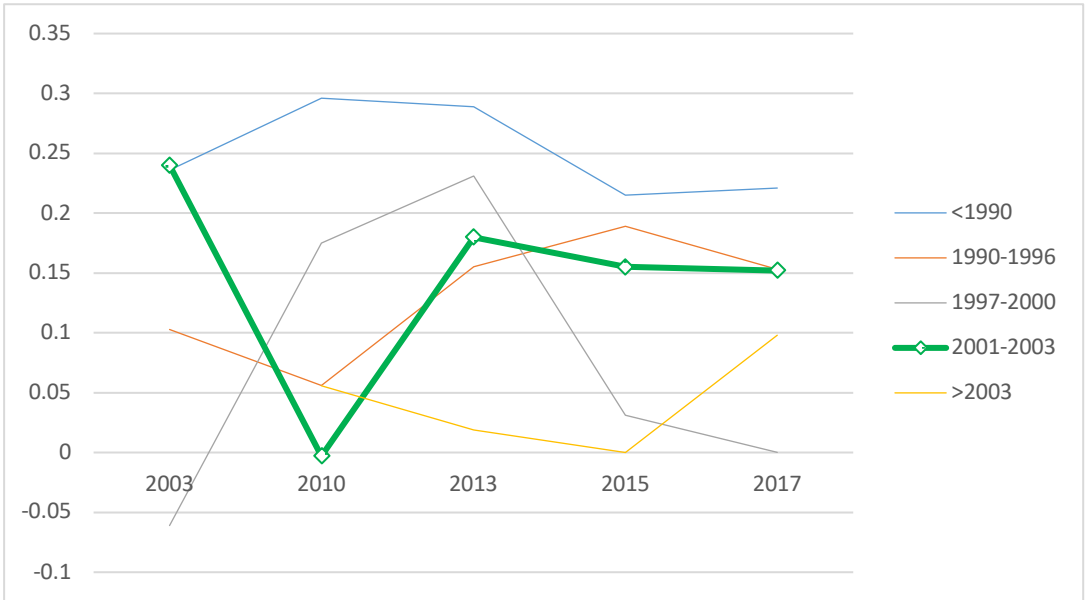
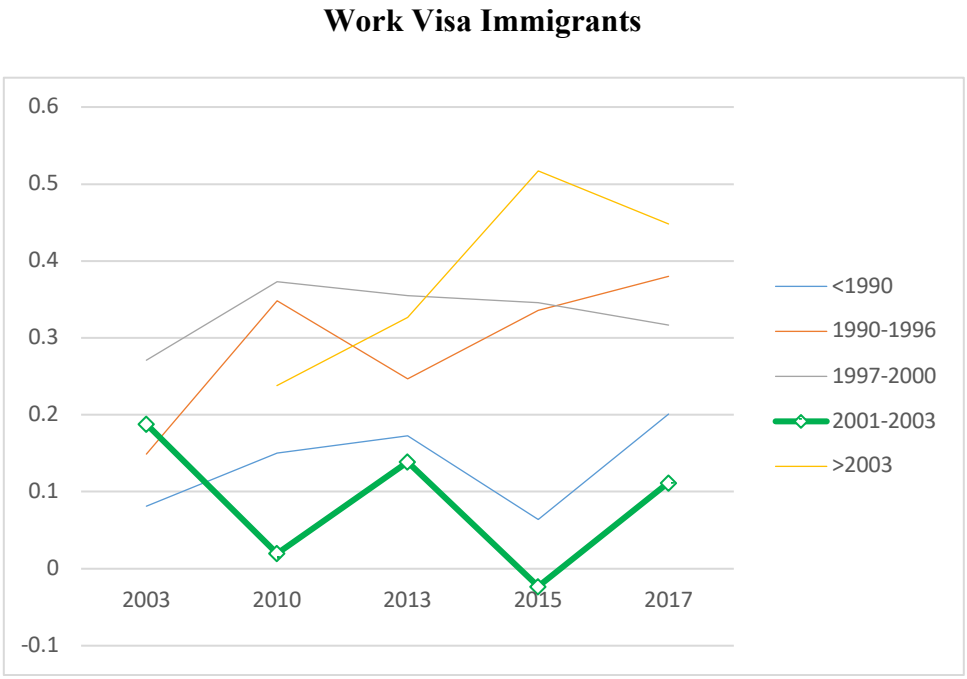


Figure 4: Age Adjusted Wage Trends Relative to Natives over Survey Year for Non-Academia: Across Immigrant Entry Periods



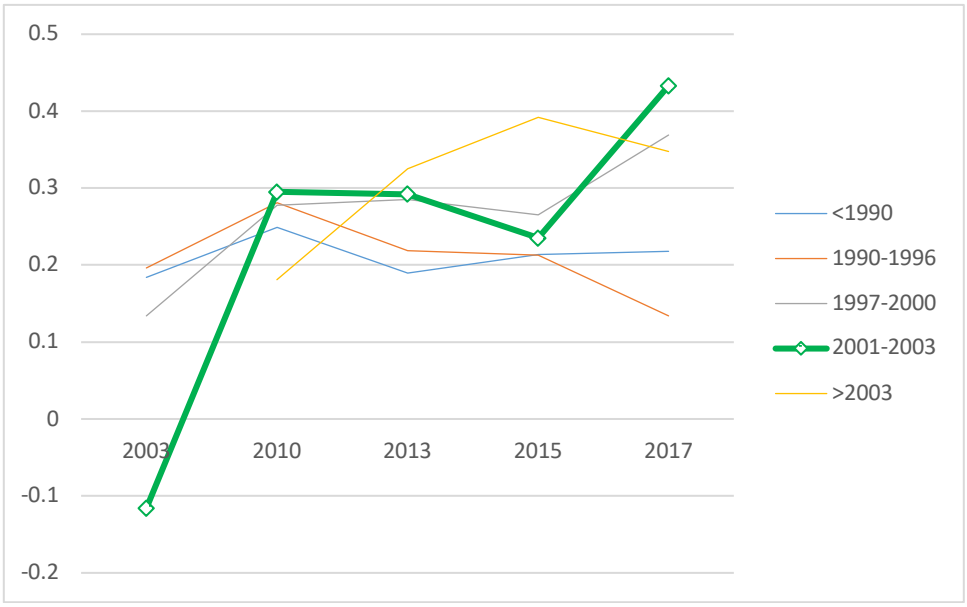


Figure 5: Age Adjusted Trends Relative to Natives over Survey Year for Cap-Bound Immigrants: Across Immigrant Entry Periods

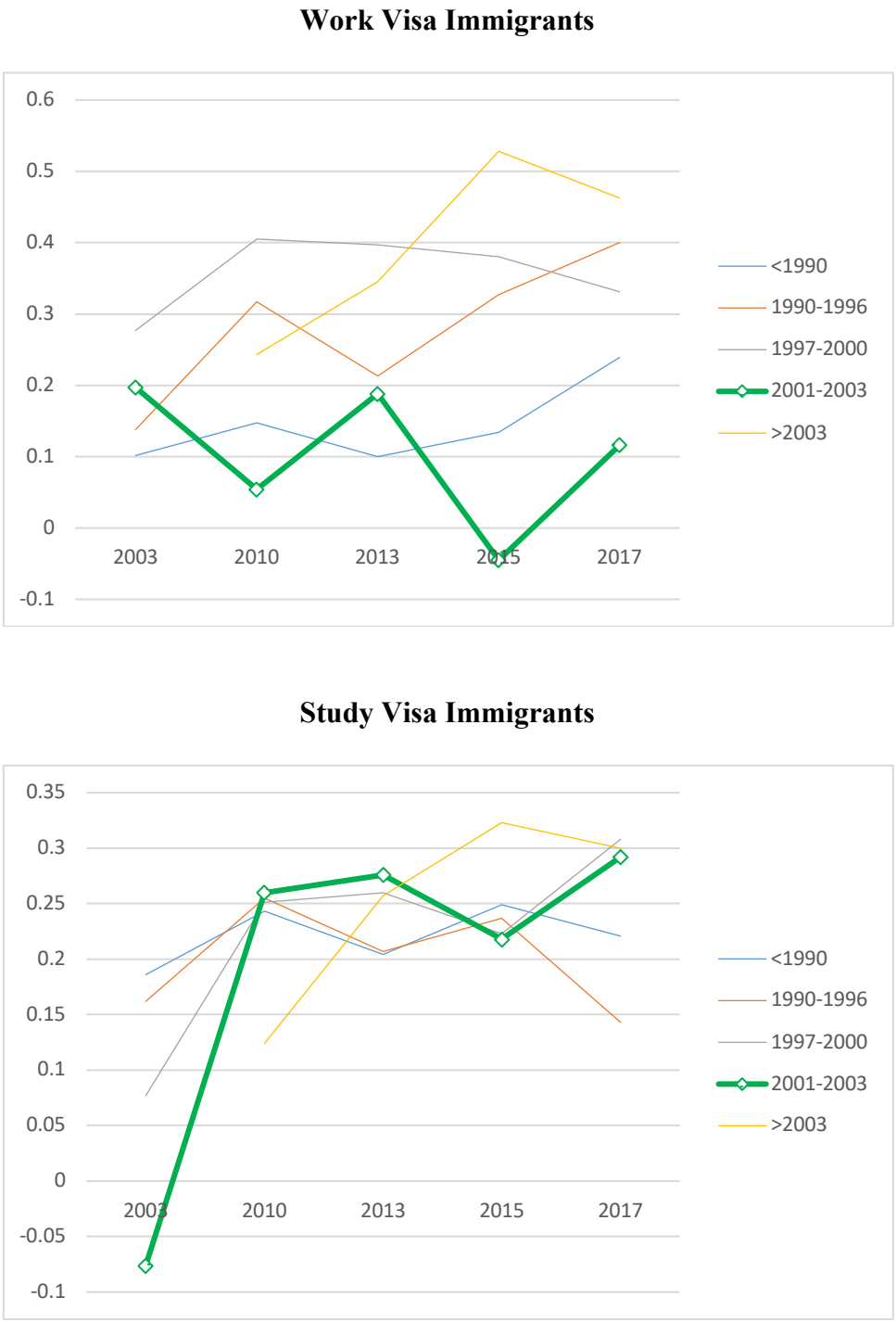
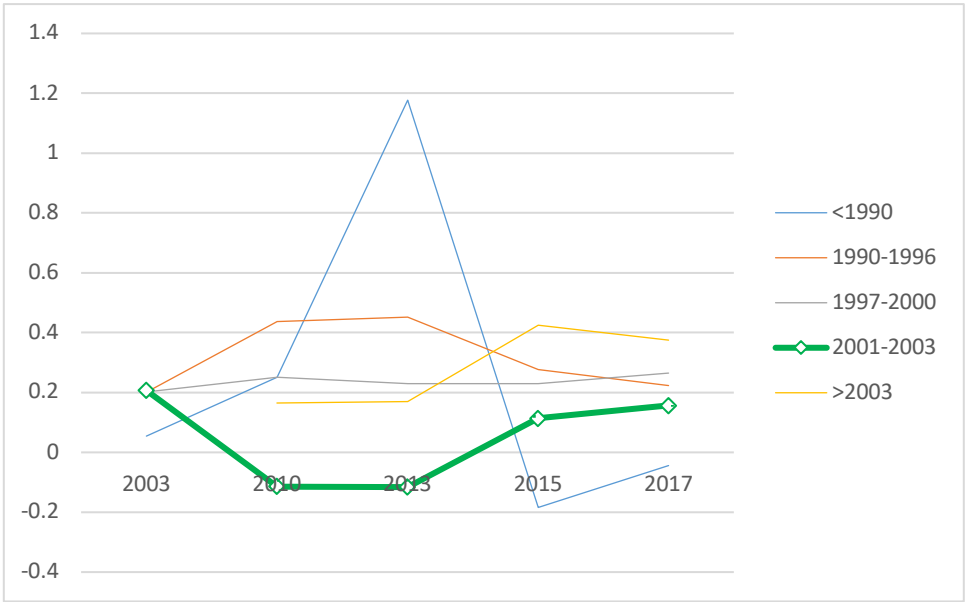


Figure 6: Age Adjusted Trends Relative to Natives over Survey Year for Cap-Exempt Immigrants: Across Immigrant Entry Periods

Work Visa Immigrants



Study Visa Immigrants

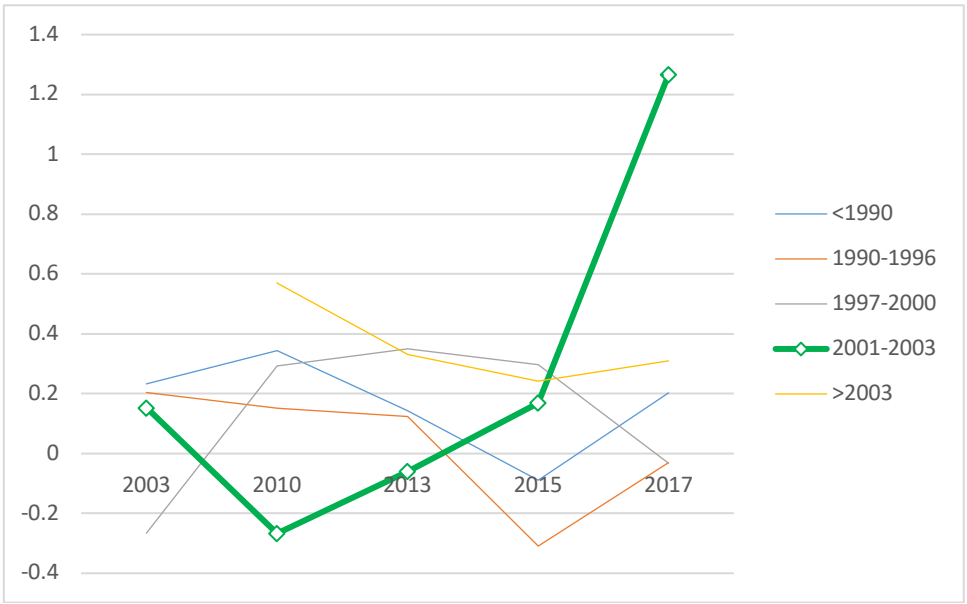


Table 1: Summary Statistics for Full Sample (weighted)

	Natives		All Immigrants		Work Visa Entry		Study/Training Visa Entry		Immigrant Visa Entry		Academia		Non-Academia	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Hourly wage (in 2017 $)	38.46	31.23	43.25	33.83	51.33	33.91	48.61	34.22	38.78	31.79	35.19	28.24	39.40	31.86
U.S. Experience (years)	16.37	11.12	13.62	9.41	11.69	8.07	14.30	9.53	14.19	9.89	13.65	10.55	16.18	10.95
Current residency status (%)														
Native	100	-	-	-	-	-	-	-	-	-	85.07	-	86.59	-
Naturalized citizen	-	-	66.85	-	34.05	-	54.03	-	86.17	-	9.3	-	9.01	-
Permanent resident	-	-	24.1	-	37.73	-	30.57	-	13.8	-	4.33	-	3.18	-
Work visa	-	-	9.05	-	28.22	-	15.4	-	-	-	1.3	-	1.22	-
Highest degree (%)														
Bachelor's	64.50	-	55.56	-	58.3	-	27.61	-	67.37	-	37.99	-	65.19	-
Master's	26.54	-	30.34	-	32.22	-	45.54	-	22.48	-	33.52	-	26.56	-
Doctorate	2.76	-	7.81	-	6.68	-	21.03	-	2.65	-	21.64	-	2.07	-
Professional	6.20	-	6.29	-	2.8	-	5.83	-	7.49	-	6.85	-	6.17	-
Highest degree from a US college/university (%)	99.55	-	58.15	-	16.74	-	75.68	-	66.26	-	92.00	-	93.88	-
Field of Study (%)														
Computer & IT	3.44	-	10.82	-	19.75	-	13.43	-	6.93	-	2.88	-	4.56	-
Mathematics and statistics	1.08	-	2.02	-	2.15	-	2.82	-	1.45	-	2.46	-	1.11	-
Biological, agricultural, and environmental life sciences	4.28	-	5.6	-	3.71	-	8.06	-	4.87	-	9.54	-	4.08	-
Physics and related sciences	1.51	-	2.8	-	2.99	-	5.04	-	2.01	-	3.73	-	1.53	-
Social and related sciences	11.06	-	8.78	-	6.5	-	6.6	-	9.82	-	12.9	-	10.59	-
Engineering (w/o computer and IT)	5.14	-	13.24	-	19.64	-	17.44	-	9.8	-	3.34	-	6.45	-
Other science and engineering related	13.09	-	16.83	-	16.48	-	13.33	-	19.3	-	17.93	-	13.27	-
Non-science and engineering	60.4	-	39.91	-	28.79	-	33.27	-	45.81	-	47.22	-	58.41	-
Age	43.22	11.30	43.39	10.23	43.08	9.17	43.45	9.91	43.60	10.91	43.04	11.89	43.25	11.10
Years since migration	-	-	20.96	12.24	13.18	8.86	19.63	10.40	24.50	12.72	-	-	-	-
Male (%)	48.92	-	54.97	-	68.14	-	63.74	-	49.78	-	41.4	-	50.36	-
Married (%)	71.67	-	76.37	-	85.43	-	75.59	-	73.48	-	66.53	-	72.78	-
Have child(ren) (%)	49.33	-	59.56	-	64.97	-	58.79	-	58.28	-	42.11	-	51.36	-
Employer's sector (%)														
Educational institution	22.42	-	14.26	-	7.91	-	18.07	-	13.62	-	100	-	15.42	-
Government	11.05	-	8.82	-	2.48	-	7.42	-	12.63	-	0	-	11.56	-
Business/Industry	66.52	-	76.92	-	89.61	-	74.51	-	73.75	-	0	-	73.02	-
Academic job (%)	6.86	-	7.71	-	4.23	-	13.87	-	5.8	-	-	-	-	-
Self-employed (%)	16.83	-	18.98	-	17.86	-	18.22	-	19.14	-	0	-	18.4	-
Physical disability (%)	8.59	-	8.41	-	6.57	-	7.08	-	9.71	-	7.69	-	8.63	-
English mother tongue (%)	-	-	12.31	-	19.86	-	8.59	-	12.97	-	-	-	-	-
Number of observations	270,813	-	71,793	-	11,320	-	23,410	-	23,904	-	38,766	-	303,840	-

Table 2: Summary Statistics (weighted) by Period of Arrival

Panel A: Work Visa Entry

	< 1990		1990 - 1996		1997-2000		2001-2003		>2003	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Hourly wage (in 2017 $)	50.07	38.18	53.93	33.86	53.26	30.97	44.12	33.61	51.82	33.65
Age	53.39	7.59	46.55	8.01	42.23	6.91	44.25	7.49	37.84	7.62
U.S. Experience (years)	22.32	10.26	15.21	6.80	12.43	5.26	11.33	3.48	5.80	3.40
Male (%)	49.48	-	62.77	-	71.91	-	58.65	-	78.13	-
Highest degree (%)										
Bachelor's	61.20	-	56.72	-	59.17	-	61.21	-	56.38	-
Master's	25.55	-	30.49	-	33.13	-	27.28	-	36.46	-
Doctorate	11.39	-	8.80	-	4.62	-	5.82	-	5.51	-
Professional	1.86	-	4.00	-	3.08	-	5.69	-	1.65	-
Highest degree from a US college/university (%)	38.00	-	23.48	-	15.24	-	11.02	-	8.54	-
Field of Study (%)										
Computer & IT	4.82	-	14.21	-	25.66	-	9.47	-	27.30	-
Mathematics and statistics	1.31	-	4.10	-	1.94	-	1.19	-	2.14	-
Biological, agricultural, and environmental life sciences	2.45	-	4.75	-	2.99	-	8.90	-	2.64	-
Physics and related sciences	2.75	-	2.81	-	3.16	-	3.03	-	3.03	-
Social and related sciences	7.03	-	5.51	-	3.78	-	12.32	-	6.57	-
Engineering (w/o computer and IT)	11.51	-	16.33	-	28.18	-	15.95	-	20.06	-
Other science and engineering related	29.47	-	29.66	-	8.64	-	13.86	-	11.77	-
Non-science and engineering	40.66	-	22.64	-	25.65	-	35.27	-	26.49	-
Number of observations	1611	-	2238	-	3128	-	1051	-	3292	-

Panel B: Study/Training Visa Entry

	< 1990		1990 - 1996		1997-2000		2001-2003		>2003	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Hourly wage (in 2017 $)	52.46	35.73	48.72	32.24	48.97	38.69	48.14	38.25	40.84	25.01
Age	51.90	7.60	43.49	6.88	39.57	6.46	37.65	5.96	32.67	5.24
U.S. Experience (years)	22.32	9.39	13.51	6.25	10.24	5.21	8.29	4.08	5.62	3.11
Male (%)	68.63	-	62.71	-	63.53	-	64.82	-	54.83	-
Highest degree (%)										
Bachelor's	33.52	-	25.67	-	28.93	-	19.47	-	21.56	-
Master's	41.95	-	43.45	-	43.44	-	52.22	-	53.10	-
Doctorate	18.92	-	22.72	-	22.75	-	25.09	-	19.74	-
Professional	5.62	-	8.17	-	4.88	-	3.21	-	5.60	-
Highest degree from a US college/university (%)	86.07	-	78.17	-	71.24	-	80.66	-	68.85	-
Field of Study (%)										
Computer & IT	10.78	-	14.14	-	14.41	-	13.79	-	16.92	-
Mathematics and statistics	2.31	-	2.46	-	5.16	-	3.34	-	2.21	-
Biological, agricultural, and environmental life sciences	6.81	-	9.36	-	7.54	-	11.47	-	7.55	-
Physics and related sciences	5.65	-	4.53	-	5.42	-	3.57	-	4.97	-
Social and related sciences	7.31	-	7.26	-	7.76	-	6.17	-	3.79	-
Engineering (w/o computer and IT)	18.51	-	12.9	-	14.36	-	24.92	-	19.01	-
Other science and engineering related	13.65	-	13.17	-	12.35	-	11.31	-	14.71	-
Non-science and engineering	34.98	-	36.18	-	33.01	-	25.43	-	30.84	-
Number of observations	8640	-	4919	-	2990	-	2175	-	4686	-

Table 3: Earnings of Immigrants relative to Natives: role of H-1B Cap Changes

Dependent Variable : log of hourly wages adj. to $2017

	Immigrants		Work Visa Entry		Study/Training Visa Entry			
					Based on year of graduation		Based on year of migration	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migration year								
< 1990	0.111***	0.105***	0.149*	0.125	0.075*	0.044	0.071**	0.047
	(0.029)	(0.028)	(0.087)	(0.076)	(0.042)	(0.045)	(0.028)	(0.029)
1990 - 1996	0.076**	0.060*	0.222***	0.172***	0.028	-0.004	0.035	0.024
	(0.031)	(0.032)	(0.046)	(0.043)	(0.042)	(0.041)	(0.042)	(0.042)
1997 - 2000	0.113***	0.090**	0.247***	0.186***	0.043	0.029	0.112***	0.092**
	(0.036)	(0.035)	(0.047)	(0.047)	(0.043)	(0.041)	(0.042)	(0.045)
2001 - 2003	0.078*	0.066	0.082	0.075	0.085**	0.058	0.110*	0.078
	(0.043)	(0.044)	(0.053)	(0.052)	(0.037)	(0.037)	(0.059)	(0.065)
> 2003	0.114**	0.085*	0.349***	0.301***	0.119***	0.096**	0.114**	0.082*
	(0.050)	(0.047)	(0.044)	(0.047)	(0.038)	(0.038)	(0.052)	(0.046)
Highest degree								
Master's	0.246***	0.244***	0.234***	0.234***	0.239***	0.237***	0.238***	0.236***
	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Ph.D.	0.407***	0.413***	0.394***	0.400***	0.399***	0.403***	0.391***	0.397***
	(0.016)	(0.017)	(0.019)	(0.020)	(0.017)	(0.019)	(0.018)	(0.019)
Professional	0.565***	0.533***	0.560***	0.530***	0.567***	0.536***	0.568***	0.537***
	(0.012)	(0.011)	(0.013)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)
Field of Study								
Computer & IT	-	0.224***	-	0.208***	-	0.206***	-	0.208***
	-	(0.010)	-	(0.008)	-	(0.006)	-	(0.006)
Math & stat	-	0.095***	-	0.098***	-	0.103***	-	0.102***
	-	(0.017)	-	(0.013)	-	(0.013)	-	(0.014)
Bio, agri, env	-	-0.057***	-	-0.054***	-	-0.056***	-	-0.058***
	-	(0.012)	-	(0.010)	-	(0.010)	-	(0.011)
Physics and related	-	0.040***	-	0.047***	-	0.044***	-	0.042***
	-	(0.010)	-	(0.011)	-	(0.012)	-	(0.012)
Social and related	-	-0.005	-	-0.005	-	-0.006	-	-0.004
	-	(0.010)	-	(0.010)	-	(0.010)	-	(0.010)
Engineering (w/o comp and IT)	-	0.206***	-	0.222***	-	0.212***	-	0.212***
	-	(0.013)	-	(0.015)	-	(0.015)	-	(0.015)
Other S&E related	-	0.148***	-	0.149***	-	0.146***	-	0.147***
	-	(0.009)	-	(0.008)	-	(0.007)	-	(0.007)
Age	0.030***	0.031***	0.027***	0.028***	0.026***	0.026***	0.026***	0.026***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Age squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
U.S. work experience	0.024***	0.023***	0.024***	0.024***	0.025***	0.025***	0.025***	0.025***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
U.S. work experience squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.128***	0.113***	0.127***	0.114***	0.125***	0.113***	0.124***	0.112***
	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)
Married	0.105***	0.101***	0.112***	0.108***	0.112***	0.108***	0.111***	0.107***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Has child(ren)	0.059***	0.055***	0.063***	0.060***	0.063***	0.059***	0.063***	0.059***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
English speaking	0.094***	0.107***	0.077**	0.090**	0.038	0.049*	0.041	0.053*
	(0.030)	(0.031)	(0.035)	(0.036)	(0.027)	(0.028)	(0.027)	(0.028)
Employer sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employer region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations								
Natives	270,813	270,813	270,813	270,813	270,813	270,813	270,813	270,813
Immigrants	71,793	71,793	11,320	11,320	19,078	19,078	23,410	23,410
Total	342,606	342,606	282,133	282,133	289,891	289,891	294,223	294,223
R-squared	0.238	0.253	0.245	0.260	0.244	0.258	0.244	0.258

*** p<0.01, ** p<0.05, * p<0.1; standard errors are in parenthesis and clustered by place of birth; bachelor's degree holders, and non-S&E majors are the base groups for immigration status, highest degree, and field of study; other independent variables that exist in regressions but are not reported are as follows: physical disability, race, employer size, and self-employed. For immigrants, experience takes the number of years of job market experience in the U.S.

Table 4: Earnings of Immigrants relative to pre 1990 cohort: role of H-1B

Dependent Variable : log of hourly wages adjusted to 2017 dollars

	All Immigrants			Work Visa Entry			Study/Training Visa Entry					
							Based on year of graduation			Based on year of migration		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Migration year												
1990 - 1996	-0.035	-0.052**	-0.051**	0.038	0.024	-0.067	0.019	0.025	0.027	-0.072*	-0.068*	-0.081**
	(0.023)	(0.022)	(0.023)	(0.062)	(0.057)	(0.052)	(0.046)	(0.046)	(0.039)	(0.041)	(0.041)	(0.040)
1997 - 2000	0.013	-0.008	-0.023	0.003	0.010	-0.069	0.037	0.049	0.031	-0.020	-0.026	-0.049
	(0.039)	(0.037)	(0.036)	(0.087)	(0.070)	(0.069)	(0.064)	(0.064)	(0.058)	(0.044)	(0.045)	(0.047)
2001 - 2003	-0.024	-0.037	-0.058	-0.151	-0.112	-0.201***	0.084	0.092	0.071	-0.045	-0.044	-0.069
	(0.037)	(0.037)	(0.036)	(0.096)	(0.082)	(0.069)	(0.076)	(0.077)	(0.072)	(0.068)	(0.072)	(0.068)
> 2003	0.005	-0.030	-0.056	-0.046	-0.031	-0.131	0.105	0.117	0.071	-0.130**	-0.140**	-0.157***
	(0.048)	(0.043)	(0.042)	(0.111)	(0.093)	(0.102)	(0.093)	(0.094)	(0.087)	(0.058)	(0.057)	(0.057)
Highest degree from the U.S.	0.130***	0.134***	0.137***	-0.025	-0.009	0.019	0.132**	0.120**	0.079	0.048	0.031	0.038
	(0.022)	(0.023)	(0.022)	(0.044)	(0.040)	(0.033)	(0.054)	(0.050)	(0.055)	(0.033)	(0.033)	(0.034)
Highest degree												
Master's	0.229***	0.220***	0.200***	0.087***	0.098***	0.096***	0.237***	0.230***	0.203***	0.211***	0.210***	0.194***
	(0.020)	(0.021)	(0.019)	(0.021)	(0.022)	(0.020)	(0.037)	(0.036)	(0.031)	(0.030)	(0.030)	(0.027)
Ph.D.	0.353***	0.362***	0.341***	0.099	0.113*	0.166***	0.409***	0.445***	0.412***	0.371***	0.415***	0.397***
	(0.029)	(0.026)	(0.024)	(0.073)	(0.067)	(0.034)	(0.036)	(0.042)	(0.041)	(0.037)	(0.039)	(0.035)
Professional	0.528***	0.456***	0.437***	0.203	0.095	0.114	0.710***	0.641***	0.585***	0.690***	0.608***	0.590***
	(0.037)	(0.037)	(0.042)	(0.139)	(0.147)	(0.149)	(0.074)	(0.069)	(0.057)	(0.059)	(0.056)	(0.058)
Field of Study												
Computer & IT	-	0.230***	0.217***	-	0.145***	0.157***	-	0.101**	0.065	-	0.136***	0.112***
	-	(0.025)	(0.022)	-	(0.046)	(0.049)	-	(0.049)	(0.043)	-	(0.044)	(0.040)
Math & stat	-	0.089	0.093*	-	0.115	0.169**	-	0.129**	0.110**	-	0.112	0.101
	-	(0.055)	(0.056)	-	(0.074)	(0.067)	-	(0.051)	(0.044)	-	(0.070)	(0.066)
Bio, agri, env	-	-0.072	-0.066	-	-0.103	-0.105	-	-0.163**	-0.207***	-	-0.163***	-0.190***
	-	(0.047)	(0.048)	-	(0.076)	(0.078)	-	(0.073)	(0.059)	-	(0.057)	(0.046)
Physics and related	-	0.068**	0.059**	-	0.048	0.059	-	-0.045	-0.064	-	-0.015	-0.036
	-	(0.028)	(0.026)	-	(0.049)	(0.039)	-	(0.065)	(0.064)	-	(0.049)	(0.047)
Social and related	-	-0.013	-0.021	-	-0.055	-0.049	-	-0.075*	-0.093**	-	-0.027	-0.037
	-	(0.028)	(0.027)	-	(0.126)	(0.135)	-	(0.043)	(0.041)	-	(0.058)	(0.053)
Engineering (w/o comp and IT)	-	0.161***	0.165***	-	0.120**	0.146***	-	0.010	-0.004	-	0.045	0.039
	-	(0.034)	(0.028)	-	(0.048)	(0.035)	-	(0.042)	(0.038)	-	(0.038)	(0.034)
Other S&E related	-	0.183***	0.204***	-	0.213***	0.220***	-	0.107**	0.070	-	0.135***	0.119***
	-	(0.044)	(0.050)	-	(0.081)	(0.083)	-	(0.052)	(0.049)	-	(0.041)	(0.042)
Age	0.043***	0.044***	0.043***	0.065***	0.063***	0.068***	0.025	0.027*	0.038***	0.007	0.011	0.017
	(0.006)	(0.006)	(0.006)	(0.010)	(0.011)	(0.009)	(0.015)	(0.016)	(0.013)	(0.013)	(0.013)	(0.011)
Age squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.000**	-0.000**	-0.000***	-0.000	-0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
U.S. work experience	0.019***	0.017***	0.017***	-0.008	-0.006	-0.003	0.032***	0.032***	0.028***	0.029***	0.027***	0.028***
	(0.003)	(0.003)	(0.003)	(0.007)	(0.006)	(0.005)	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)	(0.005)
U.S. work experience squared	-0.000	-0.000	-0.000	0.000**	0.000**	0.000	-0.000*	-0.000*	-0.000	-0.000***	-0.000**	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.149***	0.119***	0.112***	0.196***	0.182***	0.197***	0.140***	0.126***	0.126***	0.120***	0.102***	0.107***
	(0.024)	(0.021)	(0.020)	(0.029)	(0.032)	(0.023)	(0.038)	(0.041)	(0.038)	(0.028)	(0.031)	(0.029)
Married	0.056**	0.056**	0.049**	0.028	0.023	0.019	0.012	0.017	-0.002	-0.003	0.001	-0.002
	(0.025)	(0.023)	(0.022)	(0.038)	(0.034)	(0.037)	(0.034)	(0.033)	(0.030)	(0.036)	(0.035)	(0.033)
Has child(ren)	0.047***	0.043***	0.046***	0.037	0.047*	0.053**	0.024	0.018	0.036	0.038	0.031	0.043*
	(0.014)	(0.014)	(0.015)	(0.027)	(0.026)	(0.021)	(0.024)	(0.025)	(0.025)	(0.024)	(0.025)	(0.025)
Country of origin	-	-	Yes	-	-	Yes	-	-	Yes	-	-	Yes
Employer sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employer region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	71,793	71,793	71,793	11,320	11,320	11,320	19,078	19,078	19,078	23,410	23,410	23,410
R-squared	0.226	0.247	0.280	0.238	0.259	0.338	0.237	0.250	0.317	0.228	0.244	0.296

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are standard errors clustered by birth country. Immigrants who migrated before 1990, bachelor's degree holders, and non-S&E majors are the base groups for immigrants, highest degree, and field of study; other independent variables that exist in regressions but are not reported are as follows: physical disability, race, employer size, and self-employed.

Table 5: Earnings of Immigrants in Academic Sector: Role of H-1B
Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	All Immigrants		Work Visa Entry		Study/Training Visa Entry			
					Based on year of graduation		Based on year of migration	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migration year								
< 1990	0.112***	0.108***	0.280***	0.194**	0.106***	0.094**	0.050	0.049
	(0.037)	(0.038)	(0.099)	(0.082)	(0.037)	(0.038)	(0.038)	(0.041)
1990 - 1996	0.013	0.019	0.116	0.087	0.014	0.012	-0.024	-0.011
	(0.039)	(0.041)	(0.104)	(0.081)	(0.042)	(0.044)	(0.039)	(0.044)
2001 - 2003	0.053	0.040	-0.033	-0.024	-0.010	-0.030	-0.022	-0.038
	(0.056)	(0.050)	(0.103)	(0.099)	(0.065)	(0.063)	(0.055)	(0.057)
1997 - 2000 or > 2003	-0.025	-0.019	0.141	0.149*	-0.039	-0.041	-0.059	-0.050
	(0.041)	(0.044)	(0.089)	(0.085)	(0.045)	(0.048)	(0.050)	(0.051)
No. of observations								
Natives	30,067	30,067	30,067	30,067	30,067	30,067	30,067	30,067
Immigrants	8,699	8,699	664	664	3,288	3,288	4,521	4,521
Total	38,766	38,766	30,731	30,731	33,355	33,355	34,588	34,588
R-squared	0.306	0.326	0.308	0.328	0.310	0.330	0.309	0.330

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are standard errors clustered by place of birth . U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, field of education (only in columns (2), (4), (6), and (8)), age (squared), US work experience (squared), gender, marital status, children, English speaking, employer region, survey year, physical disability, race, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated Before 1990

	All Immigrants		Work Visa Entry		Study/Training Visa Entry			
					Based on year of graduation		Based on year of migration	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migration year								
1990 - 1996	-0.040	-0.015	-0.041	-0.075	-0.057	0.005	-0.018	-0.036
	(0.041)	(0.033)	(0.092)	(0.094)	(0.043)	(0.047)	(0.044)	(0.042)
2001 - 2003	0.026	0.003	-0.115	-0.143	-0.073	-0.052	-0.009	-0.075
	(0.059)	(0.050)	(0.123)	(0.136)	(0.086)	(0.087)	(0.073)	(0.066)
1997 - 2000 or > 2003	-0.037	-0.014	0.026	0.125	-0.126*	-0.067	-0.028	-0.082
	(0.055)	(0.046)	(0.128)	(0.167)	(0.070)	(0.069)	(0.062)	(0.059)
No. of observations	8,699	8,699	664	664	3,288	3,288	4,521	4,521
R-squared	0.296	0.388	0.290	0.499	0.314	0.431	0.294	0.422

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. Immigrants who arrived before 1990 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, field of education (column 2, 4, 6, and 8), age (squared), US work experience (squared), gender, marital status, children, country of origin (columns 2, 4, 6, and 8), employer region, survey year, physical disability, race, employer size, and self-employed.

Table 6: Earnings of Immigrants in Non-academic sector: Role of H-1B

Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	All Immigrants		Work Visa Entry		Study/Training Visa Entry			
					Based on year of graduation		Based on year of migration	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migration year								
< 1990	0.112***	0.106***	0.133	0.112	0.074	0.040	0.073**	0.047
	(0.030)	(0.029)	(0.081)	(0.071)	(0.046)	(0.049)	(0.031)	(0.032)
1990 - 1996	0.085**	0.067*	0.231***	0.178***	0.030	-0.004	0.045	0.031
	(0.034)	(0.034)	(0.046)	(0.043)	(0.046)	(0.045)	(0.046)	(0.047)
2001 - 2003	0.084*	0.072	0.089	0.078	0.105**	0.077*	0.137*	0.103
	(0.050)	(0.050)	(0.056)	(0.054)	(0.045)	(0.045)	(0.072)	(0.078)
1997 - 2000 or > 2003	0.126***	0.097**	0.311***	0.255***	0.122***	0.098**	0.148***	0.116***
	(0.043)	(0.041)	(0.042)	(0.046)	(0.039)	(0.038)	(0.039)	(0.038)
No. of observations								
Natives	240,746	240,746	240,746	240,746	240,746	240,746	240,746	240,746
Immigrants	63,094	63,094	10,656	10,656	15,790	15,790	18,889	18,889
Total	303,840	303,840	251,402	251,402	256,536	256,536	259,635	259,635
R-squared	0.235	0.251	0.242	0.257	0.240	0.256	0.241	0.256

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, field of education (only in columns (2), (4), (6), and (8)), age (squared), US work experience (squared), gender, marital status, children, English speaking, employer region, survey year, physical disability, race, employer size, employer sector, and self-employed.

Panel B: Relative to Immigrants Who Migrated Before 1990

	All Immigrants		Work Visa Entry		Study/Training Visa Entry			
					Based on year of graduation		Based on year of migration	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migration year								
1990 - 1996	-0.026	-0.040*	0.065	-0.050	-0.055	-0.068*	0.000	0.018
	(0.023)	(0.024)	(0.060)	(0.047)	(0.038)	(0.036)	(0.051)	(0.043)
2001 - 2003	-0.010	-0.042	-0.112	-0.169***	0.010	-0.015	0.048	0.051
	(0.039)	(0.038)	(0.089)	(0.060)	(0.081)	(0.078)	(0.073)	(0.066)
1997 - 2000 or > 2003	0.026	-0.022	0.017	-0.069	-0.019	-0.053	0.039	0.032
	(0.039)	(0.037)	(0.088)	(0.071)	(0.045)	(0.050)	(0.073)	(0.062)
No. of observations	63,094	63,094	10,656	10,656	18,889	18,889	15,790	15,790
R-squared	0.230	0.287	0.241	0.345	0.222	0.296	0.231	0.321

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. Immigrants who arrived before 1990 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, field of education (column 2, 4, 6, and 8), age (squared), US work experience (squared), gender, marital status, children, country of origin (columns 2, 4, 6, and 8), employer sector, employer region, survey year, physical disability, race, employer size, and self-employed.

Table 7: Earnings of immigrants from H-1B Cap Bound Countries (Excluding Natives and Immigrants with Doctorate or Professional Degrees)
Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
1990 - 1996	0.056	0.207***	-0.068	-0.004
	(0.041)	(0.052)	(0.093)	(0.048)
2001 - 2003	0.066	0.132**	0.062	0.083
	(0.049)	(0.056)	(0.046)	(0.072)
1997 - 2000 or > 2003	0.089*	0.280***	0.080**	0.108***
	(0.046)	(0.050)	(0.035)	(0.034)
No. of observations				
Natives	240,096	240,096	240,096	240,096
Immigrants	31,338	7,381	7,778	9,196
Total	271,434	247,477	247,874	249,292
R-squared	0.217	0.222	0.218	0.217

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by place of birth. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, field of education, age (squared), US work experience (squared), gender, marital status, children, English speaking, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated 1990-1996

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
2001 - 2003	-0.010	-0.057*	0.067	0.042
	(0.032)	(0.034)	(0.077)	(0.095)
1997 - 2000 or > 2003	0.001	0.030	0.055	0.039
	(0.028)	(0.030)	(0.076)	(0.075)
No. of observations	31,338	7,381	7,778	9,196
R-squared	0.327	0.360	0.436	0.373

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parenthesis are robust standard errors. Immigrants who arrived 1990-1996 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, field of education, age (squared), US work experience (squared), gender, marital status, children, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Table 8: Earnings of immigrants from H-1B Cap Exempt Countries (Excluding Natives and Immigrants with Doctorate or Professional Degrees)
Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
1990 - 1996	0.166***	0.220***	0.026	-0.040
	(0.055)	(0.014)	(0.053)	(0.202)
2001 - 2003	0.419***	0.022	0.175***	0.919
	(0.090)	(0.201)	(0.065)	(0.574)
1997 - 2000 or > 2003	0.192***	0.267***	0.161**	0.291***
	(0.053)	(0.033)	(0.065)	(0.095)
No. of observations				
Natives	240,096	240,096	240,096	240,096
Immigrants	2,021	1,073	2,300	284
Total	242,117	241,169	242,396	240,380
R-squared	0.216	0.217	0.216	0.216

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by place of birth. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, field of education, age (squared), US work experience (squared), gender, marital status, children, English speaking, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated 1990-1996

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
2001 - 2003	0.160***	-0.060	0.048	-0.015
	(0.020)	(0.184)	(0.117)	(0.126)
1997 - 2000 or > 2003	-0.067	-0.090	-0.055	0.040
	(0.036)	(0.080)	(0.087)	(0.131)
No. of observations	2,021	1,073	2,300	284
R-squared	0.428	0.481	0.428	0.798

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parenthesis are robust standard errors. Immigrants who arrived 1990-1996 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, field of education, age (squared), US work experience (squared), gender, marital status, children, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Table 9: Earnings of Immigrants with a Degree in Computer or IT

Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	Work Visa Entry	Study/Training Visa Entry	
		Based on year of graduation	Based on year of migration
Migration year			
< 1990	0.290***	-0.033	-0.037
	(0.060)	(0.047)	(0.041)
1990 - 1996	0.217***	-0.028	0.026
	(0.051)	(0.038)	(0.040)
2001 - 2003	0.264***	-0.000	0.039
	(0.053)	(0.039)	(0.041)
1997 - 2000 or > 2003	0.284***	0.059	0.090***
	(0.045)	(0.038)	(0.033)
No. of observations			
Natives	14,947	14,947	14,947
Immigrants	2,438	2,439	2,440
Total	17,385	17,386	17,387
R-squared	0.266	0.267	0.269

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, age (squared), US work experience (squared), gender, marital status, children, English speaking, employer sector, employer region, survey year, physical disability, race, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated Before 1990

	Work Visa Entry	Study/Training Visa Entry	
		Based on year of graduation	Based on year of migration
Migration year			
1990 - 1996	-0.121	-0.100*	0.002
	(0.084)	(0.055)	(0.043)
2001 - 2003	-0.167	-0.165**	-0.038
	(0.103)	(0.066)	(0.057)
1997 - 2000 or > 2003	-0.148*	-0.127*	-0.042
	(0.087)	(0.072)	(0.066)
No. of observations	2,438	3,034	3,332
R-squared	0.279	0.364	0.354

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. Immigrants who arrived before 1990 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, age (squared), US work experience (squared), gender, marital status, children, country of origin, employer sector, employer region, survey year, physical disability, race, employer size, and self-employed.

Table 10: Earnings of Immigrants with a Degree in a Non-Science & Engineering Field

Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	Work Visa Entry	Study/Training Visa Entry	
		Based on year of graduation	Based on year of migration
Migration year			
< 1990	0.028	0.179**	0.125***
	(0.096)	(0.073)	(0.047)
1990 - 1996	0.197**	0.008	0.042
	(0.076)	(0.109)	(0.082)
2001 - 2003	0.061	0.173***	0.336***
	(0.144)	(0.065)	(0.118)
1997 - 2000 or > 2003	0.327***	0.136**	0.108*
	(0.052)	(0.057)	(0.057)
No. of observations			
Natives	93,594	93,594	93,594
Immigrants	1,946	3,762	4,182
Total	95,540	97,356	97,776
R-squared	0.217	0.215	0.215

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, age (squared), US work experience (squared), gender, marital status, children, English speaking, employer sector, employer region, survey year, physical disability, race, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated Before 1990

	Work Visa Entry	Study/Training Visa Entry	
		Based on year of graduation	Based on year of migration
Migration year			
1990 - 1996	-0.011	-0.050	-0.105
	(0.091)	(0.093)	(0.083)
2001 - 2003	-0.046	0.076	0.092
	(0.116)	(0.127)	(0.110)
1997 - 2000 or > 2003	0.021	-0.050	-0.098
	(0.101)	(0.105)	(0.079)
No. of observations	1,946	3,762	4,182
R-squared	0.538	0.380	0.373

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by birth place. Immigrants who arrived before 1990 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, age (squared), US work experience (squared), gender, marital status, children, country of origin, employer sector, employer region, survey year, physical disability, race, employer size, and self-employed.

Appendix

Table 1A: Earnings of immigrants from H-1B Cap Bound Countries (Including Natives and Immigrants with Doctorate or Professional Degrees)
Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
1990 - 1996	0.046	0.168***	-0.057	0.010
	(0.041)	(0.051)	(0.079)	(0.042)
2001 - 2003	0.039	0.105*	0.035	0.034
	(0.048)	(0.056)	(0.040)	(0.054)
1997 - 2000 or > 2003	0.069	0.255***	0.056	0.067**
	(0.047)	(0.053)	(0.034)	(0.034)
No. of observations				
Natives	270,813	270,813	270,813	270,813
Immigrants	39,340	8,495	11,192	14,289
Total	310,153	279,308	282,005	285,102
R-squared	0.254	0.259	0.258	0.258

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by place of birth. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, field of education, age (squared), US work experience (squared), gender, marital status, children, English speaking, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated 1990-1996

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
2001 - 2003	-0.032	-0.054	0.081	0.020
	(0.028)	(0.035)	(0.064)	(0.073)
1997 - 2000 or > 2003	-0.007	0.026	0.066	0.026
	(0.027)	(0.028)	(0.062)	(0.065)
No. of observations	39,340	8,495	11,192	14,289
R-squared	0.327	0.347	0.416	0.350

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parenthesis are robust standard errors. Immigrants who arrived 1990-1996 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, field of education, age (squared), US work experience (squared), gender, marital status, children, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Table 2A: Earnings of immigrants from H-1B Cap Exempt Countries (Including Natives and Immigrants with Doctorate or Professional Degrees)
Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: Relative to Natives

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
1990 - 1996	0.127***	0.201***	0.154**	0.000
	(0.043)	(0.014)	(0.063)	(0.077)
2001 - 2003	0.220***	-0.150**	0.122**	0.633*
	(0.035)	(0.074)	(0.061)	(0.334)
1997 - 2000 or > 2003	0.161***	0.255***	0.331**	0.164*
	(0.053)	(0.032)	(0.141)	(0.094)
No. of observations				
Natives	270,813	270,813	270,813	270,813
Immigrants	2,420	1,214	370	481
Total	273,233	272,027	271,183	271,294
R-squared	0.255	0.257	0.256	0.256

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors clustered by place of birth. U.S. natives are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, field of education, age (squared), US work experience (squared), gender, marital status, children, English speaking, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Panel B: Relative to Immigrants Who Migrated 1990-1996

	All Immigrants	Work Visa Entry	Study/Training Visa Entry	
			Based on year of graduation	Based on year of migration
Migration year				
2001 - 2003	0.027	-0.231*	-0.030	-0.232***
	(0.053)	(0.104)	(0.057)	(0.045)
1997 - 2000 or > 2003	-0.101**	-0.095	-0.040	-0.263***
	(0.028)	(0.084)	(0.057)	(0.031)
No. of observations	2,420	1,214	3,959	481
R-squared	0.387	0.440	0.403	0.719

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parenthesis are robust standard errors. Immigrants who arrived 1990-1996 are the base groups for immigration status; other independent variables that exist in regressions but are not reported are as follows: highest level of education, highest degree from US, field of education, age (squared), US work experience (squared), gender, marital status, children, employer sector, employer region, survey year, physical disability, race, employer sector, employer size, and self-employed.

Table 3A: Earnings of US-Born Natives: Changes in Wages Through H-1B Cap Changes

Dependent Variable : log of hourly wages adjusted to 2017 dollars

	All Natives	Academia	Non-Academia	Computer & IT	Non-S&E
Highest degree graduation year					
1990 - 1996	0.025	0.024	0.025	0.022	0.015
	(0.018)	(0.025)	(0.018)	(0.034)	(0.026)
2001 - 2003	0.073***	0.090**	0.069***	-0.004	0.073***
	(0.018)	(0.037)	(0.018)	(0.030)	(0.022)
1997 - 2000 or > 2003	0.045***	0.100***	0.035**	0.026	0.039
	(0.015)	(0.034)	(0.016)	(0.027)	(0.027)
Highest degree					
Master's	0.236***	0.183***	0.210***	0.211***	0.243***
	(0.006)	(0.013)	(0.009)	(0.011)	(0.009)
Ph.D.	0.411***	0.428***	0.394***	-	-
	(0.020)	(0.019)	(0.026)	-	-
Professional	0.533***	0.320***	0.564***	-	-
	(0.011)	(0.034)	(0.012)	-	-
No. of observations	270,813	30,067	240,746	14,641	81,829
R-squared	0.262	0.337	0.246	0.258	0.194

*** p<0.01, ** p<0.05, * p<0.1; Numbers in parentheses are robust standard errors; results are clustered at the country of origin level; coefficients are estimated using OLS weighted by survey weights; log of hourly wages adjusted to 2017 dollars is the dependent variable. Natives who got their highest university degree before 1990 and bachelor's degree holders are the base groups for natives and highest degree; other independent variables that exist in regressions but are not reported are as follows: field of education, age (squared), US work experience (squared), gender, marital status, children, place of birth, employer sector, employer region, survey year fixed effect, physical disability, race, employer size, and self-employed status; Natives with a doctorate or professional degree are excluded in the last two columns.

Table 4A: Earnings of immigrants with Parents Education										
Dependent Variable : log of hourly wages adjusted to 2017 dollars										
Panel A: Relative to Natives										
		Work Visa Entry				**Study Training Visa Entry Based on Year of Graduation**				
	All	Non-Academia	Academia	Cap Bound	Cap Exempt	All	Non-Academia	Academia	Cap Bound	Cap Exempt
Migration year										
<1990	0.149*	0.114	0.181**	0.105***	0.143***	0.079***	0.055*	0.052	0.067	0.107*
	(0.087)	(0.071)	(0.08)	(0.029)	(0.028)	(0.028)	(0.031)	(0.041)	(-0.028)	(0.057)
1990 - 1996	0.222***	0.178***	0.079	0.086*	0.141***	0.042	0.036	-0.01	0.035	-0.02
	(0.045)	(0.042)	(0.320)	(0.033)	(0.023)	(0.041)	(0.045)	(0.824)	(-0.042)	(0.527)
2001 - 2003	0.088	0.085	-0.03	0.095**	0.290***	0.113*	0.108	-0.038	0.077	0.553
	(0.053)	(0.053)	(0.01)	(0.043)	(0.03)	(0.058)	(0.076)	(0.053)	(-0.117)	(0.302)*
1997 - 2000 or >2003	0.314***	0.259***	0.153*	0.141***	0.229***	0.121	0.121***	-0.052	0.106***	0.165*
	(0.041)	(0.045)	(0.086)	(0.04)	(0.064)	(0.037)	(0.038)	(0.05)	(-0.036)	(0.09)
Education Father	Yes	Yes	yes	Yes	Yes	Yes	Yes			
Education Mother	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Total	282,027	251,309	30,718	280,392	276,646	292,877	259,542	34,575	292,877	271,947
R-squared	0.23	0.26	0.33	0.26	0.26	0.25	0.26	0.33	0.25	0.24
Panel B: Relative to Immigrants Who Migrated Before 1990										
		Work Visa Entry				**Study Training Visa Entry Based on Year of Graduation**				
	All	Non-Academia	Academia	Cap Bound	Cap Exempt	All	Non-Academia	Academia	Cap Bound	Cap Exempt
Migration year										
1990 - 1996	-0.059	-0.056	-0.091	0.049	-0.063**	-0.055	-0.069*	-0.035	-0.044	-0.161
	(0.043)	(0.046)	(0.095)	(0.062)	(0.022)	(0.036)	(0.036)	(0.042)	(0.037)	(0.108)
2001 - 2003	-0.171	-0.172***	-0.075	-0.031	-0.294***	-0.019	-0.025	-0.067	-0.034	0.019
	(0.06)	(0.063)	(0.126)	(0.713)	(0.057)	(0.064)	(0.072)	(0.306)	(0.599)	(0.171)
1997 - 2000 or >2003	-0.068	-0.071	0.105	0.045	-0.133***	-0.034	-0.05	-0.075	-0.042	-0.094
	(0.07)	(0.073)	(0.105)	(0.083)	(0.027)	-0.042	(0.313)	(0.059)	(0.045)	(0.151)
Education Father	Yes	yes	Yes	yes	Yes	Yes				
Education Mother	Yes	Yes	Yes	Yes	yes	Yes				
No. of observations	11,320	10,656	664	9,685	1,635	1,007	18,889	4,521	22,170	1,240
R-squared	0.356	0.354	0.534	0.264	0.39	0.587	0.31	0.43	0.24	0.53

Table 4B: Earnings of immigrants with respect to Natives (H-1B Cap Changed to a Year ahead)					
Dependent Variable : log of hourly wages adjusted to 2017 dollars					
Panel A: H-1B Cap Changed to a Year ahead					
	Work Via	**Student Visa**			
Migration year					
<1990	0.125	0.047			
	(0.076)	(0.029)			
1990 - 1996	0.164***	0.018			
	(0.053)	(0.046)			
1997 - 2000	0.194***	0.08*			
	(0.043)	(0.041)			
2001 - 2003	(0.043)	0.056			
	(0.043)	(0.05)			
>2003	(0.043)	0.099**			
	(0.043)	(0.049)			
	(0.043)				
Total	(0.043)	294,233			
R-squared	(0.043)	0.26			
Panel B: Leaving Out India & China					
	Work Via	**Student Visa**			
Migration year					
<1990	0.125	0.047			
	(0.076)	(0.029)			
1990 - 1996	0.172***	0.024			
	(0.043)	(0.042)			
1997 - 2000	0.186***	0.092**			
	(0.046)	(0.045)			
2001 - 2003	0.075	0.078			
	(0.052)	(0.065)			
>2003	0.301***	0.082*			
	(0.047)	(0.046)			
Total	282,133	294,233			
R-squared	0.26	0.26			

Table 4B: Earnings of immigrants with respect to Natives (H-1B Cap Changed to a Year ahead)
Dependent Variable : log of hourly wages adjusted to 2017 dollars

Panel A: H-1B Cap Changed to a Year ahead

	Work Via	**Student Visa**
Migration year		
<1990	0.125	0.047
	(0.076)	(0.029)
1990 - 1996	0.164***	0.018
	(0.053)	(0.046)
1997 - 2000	0.194***	0.08*
	(0.043)	(0.041)
2001 - 2003	(0.043)	0.056
	(0.043)	(0.05)
>2003	(0.043)	0.099**
	(0.043)	(0.049)
	(0.043)	
Total	(0.043)	294,233
R-squared	(0.043)	0.26

Panel B: Leaving Out India & China

	Work Via	**Student Visa**
Migration year		
<1990	0.125	0.047
	(0.076)	(0.029)
1990 - 1996	0.172***	0.024
	(0.043)	(0.042)
1997 - 2000	0.186***	0.092**
	(0.046)	(0.045)
2001 - 2003	0.075	0.078
	(0.052)	(0.065)
>2003	0.301***	0.082*
	(0.047)	(0.046)
Total	282,133	294,233
R-squared	0.26	0.26