

An Empirical Investigation of H-1B Approvals in the United States: A Causal-Comparative Study

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Abstract

In this causal-comparative study, the objective was to compare the rates of occupation, country of origin, and gender (when available) in obtaining H-1B visas in the United States during 2012-2021. The data sources used for analysis are institutional repositories like USCIS and the U.S. Department Of Labor. The number of H-1B petitions approved for computer-related occupations has increased about 10% over the last decade with 68.8% out of all occupations in 2021. The researchers found that India was the leading country granted H-1B visas, with almost 70% of all beneficiaries. Furthermore, males outnumbered females both in applying for H-1B visas as well as in obtaining those visas, with 72% of all gender beneficiaries being males.

Keywords: H-1B Visa, OPT, STEM

Introduction

The concept of a H-1B visa is a nonimmigrant work visa that allows U.S. employers to hire foreign workers for specialty jobs that require a bachelor's degree or equivalent. Relatedly, the countries, origins, and gender (when available) of the H-1B applicants are identified and tracked by the U.S. Government. The research question that arises is: What is the difference in the H-1B approval rates between country, occupation, and gender (when available) in obtaining H-1B visas in the United States? The authors of this paper will present discussions on a number of these concerns within the context of obtaining an H-1B Visa. The purpose of this quantitative methodology, causal-comparative design research study is to investigate correlations, if any, in the rates between country, origin, and gender (when gender is available) in obtaining H-1B visas in the United States in the past decade.

Literature Review

H-1B Visa

According to the U.S. Citizenship and Immigration Services (USCIS), The H-1B is a temporary (nonimmigrant) visa category that allows employers to petition for highly educated foreign professionals to work in *specialty occupations* that require at least a bachelor's degree or the equivalent. To qualify as a specialty occupation, the position must meet one of the following criteria:

- Hold a U.S. bachelor's or higher degree from an accredited college or university
- Have a foreign degree from a college or university recognized as equivalent to a U.S. bachelor's degree
- Possess any necessary licenses or other formal permissions required to practice the profession in the state in which employment is sought
- Having completed education, specialized training, or progressively responsible experience equivalent to a bachelor's degree in the specialty occupation within the United States, as well as having achieved progressively responsible positions directly related to the specialty occupation which allows them to demonstrate expertise

H-1B classifications are limited to 65,000 new statuses/visas each Fiscal Year (FY). The FY starts on October 1st and ends on September 30th. There are an additional 20,000 petitions excluded from the cap filed on behalf of beneficiaries who have earned a master's degree or higher from a U.S. institution of higher education.

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To obtain H-1B status for the first time, a foreign national is required to go through the annual H-1B quota process, and selection is dependent on a randomized lottery system. In addition, H-1B workers employed by higher education institutions, nonprofit research organizations, or government research organizations are exempt from the numerical cap. Upon receiving an H-1B visa, employees are authorized to work in the United States for up to three years, which can be extended for a total of six years. A similar visa may also be obtained by the spouse of recipients, regardless of whether the spouse may or may not work.

STEM

The acronym STEM refers to the study of Science, Technology, Engineering, and Mathematics. Dalton (2020) emphasized that, in essence, STEM is a teaching philosophy that integrates all four disciplines into a single, cross-disciplinary curriculum that focuses on practical rather than purely academic applications and methods of instruction. Thus, even though mathematics is a STEM subject, obtaining a math degree does not necessarily mean you have completed a STEM program. Unless all four disciplines are integrated and real-world teaching methods are used, STEM degrees and careers in STEM fields will not provide the essential educational benefits.

The results of Emerson's survey indicate that "Students today are twice as likely to study STEM fields compared to their parents, the number of roles requiring STEM expertise is growing at a rate that exceeds current workforce capacity" (2018, para. 2). In 2018, 2.4 million STEM jobs were unfilled in the U.S., according to the Smithsonian Science Education Center (2022). This means that there is a serious shortage of STEM professionals in the United States. As a result, international students who graduate with a degree in STEM will have a better chance of landing a job in the United States. Especially when the National Association of Manufacturing and Deloitte (2018) estimate that the United States will need to fill about 3.5 million jobs by 2025.

The Importance of OPT

Upon graduation, international students may seek employment in the U.S. under the Optional Practical Training (OPT) program. OPT is a benefit available to international students in F-1 immigration status who are enrolled in, or completing, a degree program in the U.S. This employment can be used before completion of studies (during an annual vacation or leave term) and/or after completion of studies. USCIS will grant OPT work authorization for up to 12 months to F-1 students enrolled in valid student status for a minimum of nine months.

An employment opportunity must be directly related to the student's field of study and be appropriate for the level of education that the student is pursuing. OPT does not require a job offer prior to application. In this context, a student may apply for OPT work authorization and then apply for a job later. However, the student must obtain a job within 90 days after the start date of OPT work authorization. The job can be located anywhere in the country. Additionally, it is possible for students to change jobs during their OPT period.

According to the USCIS (2022), a typical OPT authorization period is twelve months, however, students in Science, Technology, Engineering, and Mathematics (STEM) fields may extend their stay to three years. In many cases, recent graduates utilize their OPT period with a company as an opportunity to learn and develop professionally and demonstrate their ability to excel in a business environment. This may ultimately lead to their career development within the company, and leading to the possibility of receiving a H-1B visa from the employer.

Methods

This study uses a comparative causal research method to investigate correlations, if any, in the rates between occupation, country, origin, and gender (when available) in obtaining H-1B visas in the United States in 2012 - 2021. Gender was not always tracked or available in the USCIS data sets.

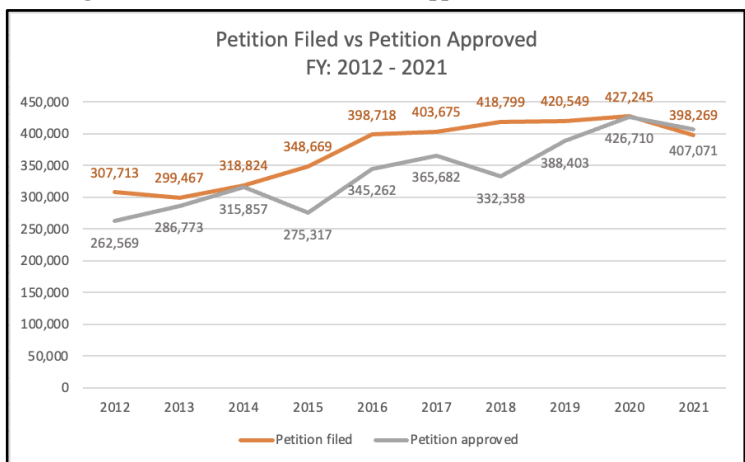
This secondary research was performed over a five month time period: from August 2022 to December 2022. The target population for this research is the individuals from around the world who obtained an H-1B visa. The data sources used for analysis are the institutional repositories like USCIS and the U.S. Department Of Labor. SPSS software is used to describe descriptive analysis. The researchers used Excel to create visuals (graphic, figures, and charts).

Results and Discussion

Obtaining H-1B Visa: Petition Filled vs Petition Approved

A significant increase in H-1B petitions has been observed in the past decade, as shown in **Figure 1**. USCIS has received an increasing number of H-1B petitions filed and approved. During FY 2020, USCIS received more H-1B petitions in FY 2020 than in any of the previous ten years at 427,245. The number of H-1B petitions filed in 2021 decreased slightly to 398,269. However, the number of petitions approved is actually greater than the number of petitions filed. This occurs because the figures for every fiscal year include petitions that were filed in a previous fiscal year but approved during the fiscal year. In addition, only a portion of the petitions filed by employers for H-1B employment are subject to the H-1B cap of 85,000. There are several petitions that are exempt from the cap, including petitions submitted by nonprofit research organizations and governmental research organizations.

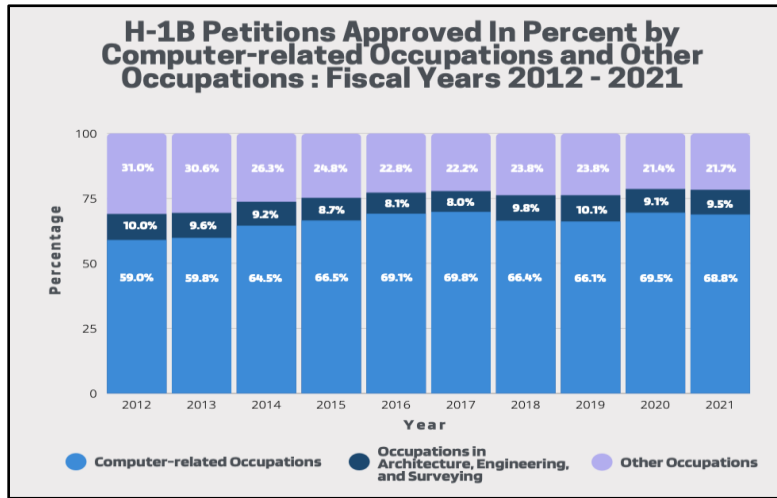
Figure 1 *Petition Filed vs Petition Approved: FY 2012 - 2021*



Obtaining H-1B Visa by Occupations

Among all occupations, computer-related occupations are the most prevalent. **Figure 2** illustrates the distribution of petitions approved for the top major occupational categories over the past decade. The number of H-1B petitions approved for computer-related occupations has increased about 10% over the last decade with 69.5% in 2020 and 68.8% in 2021. As reported by USCIS (2022), computer-relevant occupations create and support computer applications, systems, and networks. This includes Systems Analysis and Programming, Data Communications and Networks, Computer System User Support, Occupations in Computer Systems Technical Support, and Other Computer-Related Occupations. Architecture, engineering, and surveying was another major occupation group with 8% to 10.1% of all occupations. Apart from computer-related occupations, architecture, engineering, and surveying occupations, all other occupations comprised the remainder of the ratio. It is for this reason that international students will have a greater chance of obtaining a H-1B visa by pursuing a STEM degree, including majors in information technology, software development, computer network architecture, information security, and others.

Figure 2 *H-1B Petitions Approved in Percent by Occupations: FY 2012 - 2021*



Obtaining H-1B Visa by Country of Origin

The percentage of H-1B petitions approved in FY 2012 - 2021 whose country of birth was India has increased by 10% from 64.1% in 2012 to 74.1% in 2021. Among all beneficiaries, China is the second most common country of birth, accounting for 7.6% in 2012 and increasing to 12.4% in 2021. **Figure 3** shows the five most prevalent countries of birth of H-1B beneficiaries as a percentage of total approvals. In addition to India and China, Canada, the Philippines, and South Korea are in the top five of beneficiaries in 2012, accounting for 6.7 percent of beneficiaries. This percentage decreases to 2.5% after ten years. Approved petitions for beneficiaries born in India and China combined make up a large share of both initial and continuing employment.

According to **Figure 3**, Indian talent is highly sought after by American employers. A significant portion of H-1B visas approved over the past decade have been issued to the Indian population, making them the primary beneficiaries of the program that many tech companies have come to rely on for IT talent. **Figure 4** contains two variables: H-1B applicants from India and global H-1B beneficiaries for computer-related occupations. Noticeably over the past decade, a significant correlation has emerged between these two variables. When H-1B applicants from India increased, there was a global increase in beneficiaries who were employed in computer-related fields. Similarly, when H-1B applicants from India decreased, there was a global decrease in beneficiaries within computer-related fields.

Figure 3 *Top Five Country of Birth With The Highest Approval Rates of H-1B Visas (Percent) : FY 2012 - 2021*

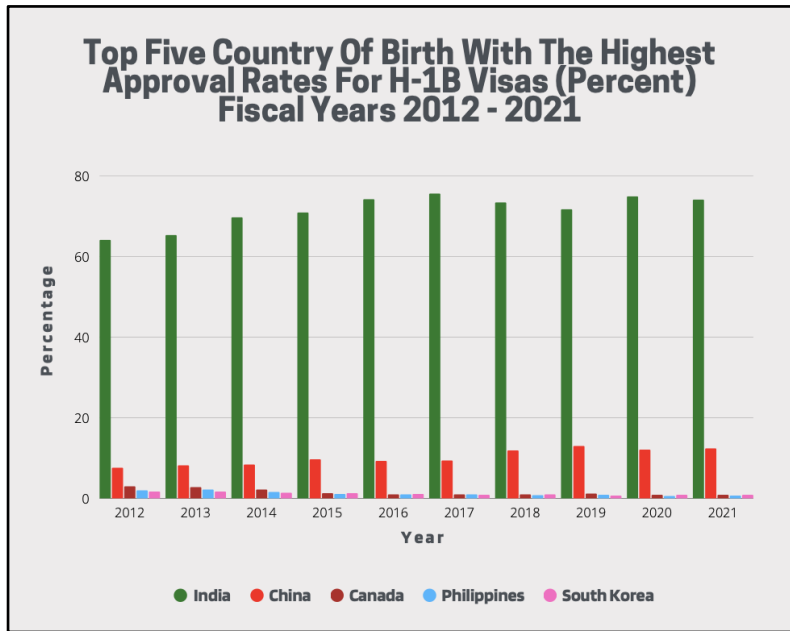
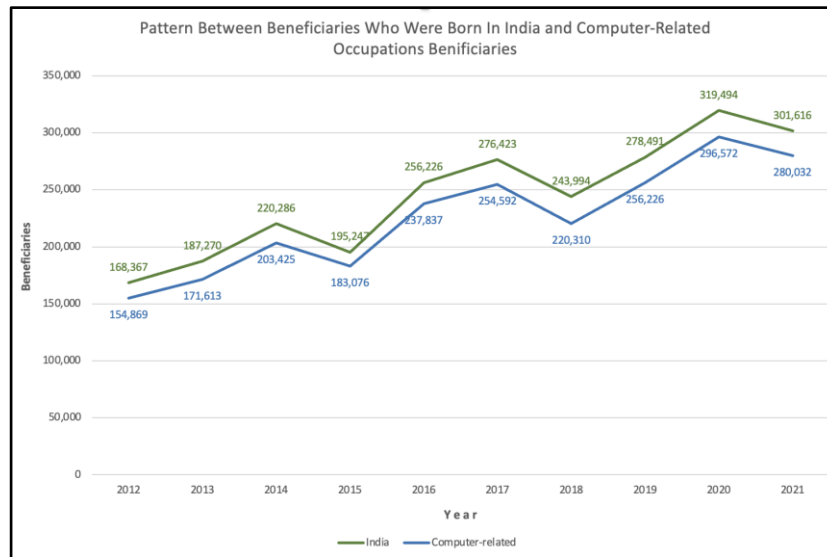


Figure 4 *Pattern Between Beneficiaries Who Were Born In India and Computer-Related Occupation Beneficiaries : FY 2012 - 2021*



The Economic Times newspaper stated that one of the reasons is because Bengaluru, a city in India, is the world's fastest growing tech hub (2021). Many national and international companies have their headquarters in Bangalore, and about half of India's information technology business, valued at about \$50 billion, is headquartered there (Dhruv, 2019). There are thousands of software engineers and IT specialists in this city from all over India. Bangalore offers a variety of advantages to foreign companies as compared to other countries. Dhruv added, despite hiring highly skilled Information Technology professionals, these companies are required to pay only a quarter of the wages they would have to pay in the U.S. or Europe (2019). For this reason, many Indian citizens wish to immigrate to the United States in order to obtain a better quality of life and higher wages. To provide a comparison, the average salary for an entry-level network engineer in India is 461,796 rupees or \$5,654 U.S. dollars (Glassdoor, 2022). Meanwhile, the starting salary of a network engineer at entry level is \$72,515 U.S. dollars in the United States (Glassdoor, 2022).

A student named Shoeb Mogal shared his experience of receiving a degree in STEM and his opportunity to work in the United States. Boston NPR News reported that Mogal studied Computer Science at Northeastern University in Boston, and when he graduated, his skills were in high demand (Khalid, 2017). During the course of one week, he had twenty interviews, and within two weeks, he received three job offers. The story of Mogal is a common one among international graduate students working in computer-related occupations, such as Information Technology (IT). According to Mogal, many tech companies are seeking employees with similar backgrounds in order to hire them to work in the United States on a long-term basis. In his opinion, there are not enough American engineers and computer programmers. He can attest to this from his own experience. More than 100 of his friends are employed by local companies on H-1B visas, he added.

Obtaining H-1B Visa by Gender

As shown in **Table 1**, males accounted for nearly three-quarters (72.2 - 73.7 percent) of all approved H-1B petitions in FY 2020 and 2021, and females accounted for 26.2 - 27.7%. No data are available regarding H-1B petitions by gender in 2019 or the previous years.

For the two years available, the denial rate (as a percentage of applications by gender) was about twice as high for females in the first year. In the second year, the denial rate was roughly equivalent. However, it would not be possible to draw any generalizable conclusions from such a small sample (two years of gender data).

Table 1 *H-1B Petitions Approved and Denied by Gender: FY 2020 & 2021*

2020		Male	Female	Unknown
	Petitions Approved	293,799	112,894	378
Petition Denied	3,285	7,698	246	
2021		Male	Female	Unknown
	Petitions Approved	314,355	111,702	653
Petition Denied	29,271	9,699	545	

Opportunities for future research

The authors of this research article discussed the H-1B application approval rates to the U.S. from various countries. It was shown that India had a significantly higher H-1B application/approval rate; much higher (more than five times) than any other country. What is lacking is an explanation of why. The authors suggest a qualitative study investigating why persons from India apply to the U.S. at such a high rate.

In the same vein as approval rates, what is not known is application rates per country of origin. The authors of this study suggest the following quantitative research questions: 1. What are the approval rates (as a percentage of application rates) in H-1B visas per country of origin? 2. Is there any significant statistical difference (bias) in approval rates for H-1B visa applications per country of origin?

Finally, the authors of this paper suggest adding gender as a dimension of future research. In this research, it was found that men receive higher raw numbers in H-1B visa approvals in the data over the last two years (as a percentage of approvals by gender). However, gender was not tracked evenly by the U.S. government with only two years of data provided. As such, research questions addressing gender bias in approvals should be investigated. Additionally, cultural aspects of applicant countries should be investigated as part of the research process.

Conclusion

In this research article, the authors utilized a comparative causal research method to investigate the comparison in the rates between occupation, country, origin, and gender (when available) in obtaining H-1B visas in the United States in the years 2012 - 2021. The researchers found that India was the predominant country granted H-1B visas. Additionally, males far exceeded females in both applications for H-1B visas as well as being granted those visas in the years that gender data was available.

According to the data in this study, Indian applicants receive the most H-1B visas out of any other applicant. Computer-related occupations were the most prevalent category for obtaining H-1B visas, making up almost 70%. Almost three fourths of the H-1B beneficiaries were Indian, and perhaps this is due to the preferred area of study for Indians. Consequently, Americans are less likely to be studying in these fields at the same rate, resulting in American employers hiring foreign employees to fill positions within computer-related occupations.

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