

April 2014

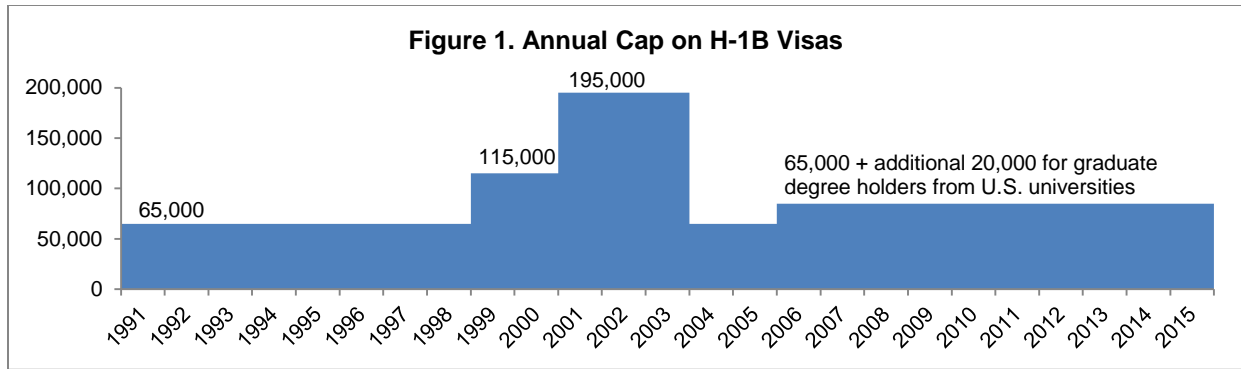
## **High-Skilled Workers and Twenty-First Century Innovation: The H-1B Program's Impact on Wages, Jobs, and the Economy**

### **Introduction**

Every year, U.S. employers seeking highly skilled foreign professionals have rolled the dice on April 1 and submitted their applications for the limited pool of H-1B visas available each fiscal year. With only 65,000 visas available for new hires - and 20,000 additional visas for foreign professionals who graduate with a Master's or Doctorate from a U.S. university - in recent years demand has far outstripped the supply and the cap has been quickly reached. Understanding the H-1B process is important to understanding the vital economic role that higher-skilled immigration plays in growing our economy and creating new opportunities for native and foreign-born workers alike. H-1B workers do not harm native-born workers' job opportunities, are not poorly compensated, and are not "cheap foreign labor." In fact, their presence often leads to higher wages and more job opportunities. Highly skilled immigrants complement their native-born peers; they do not substitute for them. This is true throughout high-skilled occupations, but is particularly true in science, technology, engineering, and mathematics (STEM) fields. Arguments that foreign-born workers and immigrants are depressing wages or displacing native-born workers are contradicted by the available evidence. The following guide answers the questions most often asked and debunks the most prevalent myths about the H-1B program.

### **What is the H-1B visa?**

- The H-1B visa is a temporary [non-immigrant employment visa](#) for highly educated foreign professionals in "specialty occupations" that require at least a bachelor's degree or the equivalent. The visa is for three years with the option to renew for an additional three years for a total of six years. H-1B visa holders may be sponsored for permanent visas by their employers.<sup>1</sup>
- As part of the application process, the employer must attest, on a [labor condition application](#) (LCA) certified by the Department of Labor, that employment of the H-1B worker will not adversely affect the wages and working conditions of similarly employed U.S. workers. The LCA must be posted at the worksite for ten days.<sup>2</sup>
- The H-1B visa is currently capped at [65,000 per year](#), with 20,000 additional visas for foreign professionals who graduate with a Master's or Doctorate from a U.S. university (Figure 1).<sup>3</sup> In recent years, the limit has been reached days after the visas are made available.



Source: U.S. Citizenship and Immigration Services.

### What is the annual H-1B visa “lottery”?

*Because the annual cap for H-1B visas is inadequate compared with the demand for high-skilled workers, U.S. Citizenship and Immigration Services (USCIS) generally receives a greater number of petitions than there are visas available, causing the cap to be met quickly in recent years. USCIS then uses a random selection process to choose from the pool of applications received.*

- When USCIS begins accepting H-1B petitions on April 1 each year, they typically end up receiving a greater number of applications than the cap allows. USCIS then stops accepting applications and puts the petitions it has already received into a lottery to randomly determine which will be selected to receive the remaining cap numbers.
  - A computer-generated [random selection process](#) is used to select the petitions needed to meet the caps of 65,000 for the general category and 20,000 under the advanced degree exemption limit.<sup>4</sup>
  - In 5 of the last 9 years the H-1B visa cap has been reached in less than 90 days (Table 1).

**Table 1. Date H-1B Cap Reached, FY2006-FY2014**

| Fiscal Year | Date Cap Reached  | Days from April 1 until Cap Reached |
|-------------|-------------------|-------------------------------------|
| 2006        | August 10, 2005   | 131                                 |
| 2007        | May 26, 2006      | 55                                  |
| 2008        | April 3, 2007     | 2                                   |
| 2009        | April 7, 2008     | 6                                   |
| 2010        | December 21, 2009 | 264                                 |
| 2011        | January 26, 2011  | 300                                 |
| 2012        | November 22, 2011 | 235                                 |
| 2013        | June 11, 2012     | 71                                  |
| 2014        | April 5, 2013     | 4                                   |

Source: U.S. Citizenship and Immigration Services.<sup>5</sup> See endnotes for references to USCIS information sources for each year.

- The cap for Fiscal Year (FY) 2014 [was filled](#) on April 5, 2013, only a few days after the first day that filing was permitted.<sup>6</sup> At that time, USCIS had received approximately [124,000 H-1B petitions](#), including petitions filed for the advanced degree exemption.<sup>7</sup>
- For the 124,000 petitions USCIS [received in April 2013](#) for FY 2014, it “conducted the selection process for advanced degree exemption petitions first. All advanced degree petitions not selected were part of the random selection process for the 65,000 limit.”<sup>8</sup>

### **How does the demand for high-skilled workers vary geographically across the U.S.?**

*Although much research explores H-1Bs from a national perspective, there is a clear geography of demand across the U.S. In part due to spatial mismatches, demand in particular geographic areas often outweighs the supply of qualified workers in those areas.*

- While the H-1B program is routinely studied at the national level,<sup>9</sup> it cannot be fully understood without drilling down to examine the role and impact of H-1B workers at the local level. Beyond Silicon Valley, places across America show a demand for high-skilled workers. According to the Brookings Institution, there were [106 metropolitan](#) areas across the United States that had at least 250 requests for H-1B workers in 2010-2011.<sup>10</sup>
  - Nearly [two-thirds](#) of requests for H-1B workers are for STEM occupations. However, workers in healthcare, business, finance, and the life sciences are also in high demand.<sup>11</sup>
  - The metropolitan areas and occupations in which H-1B visas are most requested correspond to places and jobs where there is the greatest demand for skilled workers. According to economists, demand for high-skilled workers in general is higher in metro areas where innovation industries [agglomerate](#).<sup>12</sup>
- A 2013 [study](#) from the Brookings Institution shows that 43 percent of new vacancies in STEM occupations for which there are H-1B requests go unfilled after one month. In the 100 largest metropolitan areas in the United States, 46 percent of job openings requiring significant STEM knowledge go unfilled for one month or longer,<sup>13</sup> and STEM employers report thousands of unfilled positions.
  - In 2010, for example, despite the ongoing recession, San Francisco and San Jose, California, had [25 and 19 job openings](#) for every computer graduate, respectively. In places such as Austin, Des Moines, Washington, DC, Charleston, Seattle, and Charlotte, the high-tech gap was nearly as great.<sup>14</sup>
  - A 2011 report says there were [3,200 unfilled positions](#) at Siemens,<sup>15</sup> and Microsoft reported over [6,000 unfilled job openings](#) in the United States in 2012, over half of which were for researchers, developers, and engineers.<sup>16</sup> Collectively, IBM, Intel, Microsoft, and Oracle have [10,000 U.S. job openings](#).<sup>17</sup>

## What are the impacts of H-1B visas on wages?

*There is a positive impact on the wages of native-born workers in specific geographic areas with high H-1B employment and demand. More broadly, the H-1B program contributes to a stronger economy through higher wages for STEM workers.*

- According to the Brookings Institution, in the metropolitan areas with the greatest number of H-1B requests per worker, the [average wages](#) for STEM occupations with the largest number of H-1B requests are high, the remaining vacancies are difficult to fill, and wages across those industries are growing.<sup>18</sup>
- Research shows that from 1990 (the start of the H-1B program) to 2010 H-1B-driven increases in STEM workers were associated with [significant increases in wages](#) for college educated, U.S.-born workers in 219 U.S. cities.<sup>19</sup>
  - H-1B-driven increases in STEM workers in a city were associated with [significant increases in wages](#) paid to both STEM and non-STEM college-educated natives, while non-college educated workers showed no significant wage or employment effects.<sup>20</sup>
  - A one percent increase in the foreign-born STEM worker share of total employment in a city over a decade increased the wages of both STEM and non-STEM native-born college-educated workers by [4 to 6 percent](#).<sup>21</sup>

*There is a positive impact on the wages of native-born workers in occupations with high H-1B demand and employment.*

- For occupations with the most H-1B requests, wage growth in recent years has been [much higher](#) than the national average, according to the Brookings Institution.<sup>22</sup>
  - From 2009 to 2011, there was nominal wage growth for U.S.-born workers with at least a bachelor's degree, but that growth was [relatively high](#) for most prominent occupations with large numbers of H-1B applications. In particular, wage growth was strong in computer occupations (1.3 percent growth) and engineers (2.1 percent growth).<sup>23</sup>
  - In the industry category with the most H-1B requests, Computer Systems Design and Related Services, wage growth has been [much larger](#) than the national average since 1990 (5.5 percent growth) and since 2009 (7.7 percent growth). This is in comparison to wage growth across all industries of 0.8 percent since 1990 and 1.6 percent since 2009.<sup>24</sup>
- The Brookings Institution, in a 2013 [study](#), found that, in general, H-1B workers are paid more than their non-H-1B counterparts within the same occupations for workers with similar experience.<sup>25</sup>
  - On average, H-1B workers earn [higher wages](#) than employed U.S.-born workers with bachelor's degrees, \$81,322 compared to \$67,301.<sup>26</sup> Earnings are higher among H-1B visa-holders than among native-born workers with at least a Bachelor's degree in areas

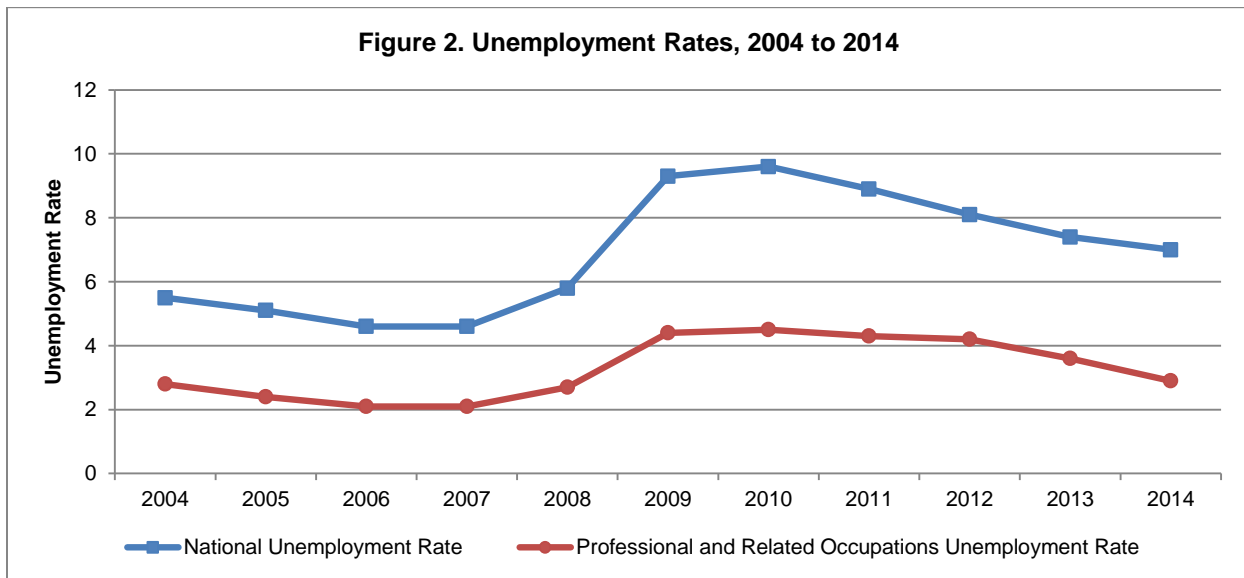
including computer and information technology, engineering, healthcare, and post-secondary education.

- When comparing workers of the same age cohort and occupation, H-1B workers earn [higher wages](#) than their native-born counterparts. Specifically, in 17 out of 20 age cohort and occupation groups, wages for H-1B workers are significantly higher than non-H-1B workers.<sup>27</sup>

### What are the impacts of H-1B visas on employment?

*Highly skilled immigrants complement their native-born peers; they do not substitute for them. This is true throughout high-skilled occupations, but is particularly true in science, technology, engineering, and mathematics (STEM) fields.*

- A 2012 report from the Information Technology Industry Council and the Partnership for a New American Economy finds that many STEM occupations have [very low unemployment](#) compared to the overall national unemployment rate, which stood at 6.7 percent as of February 2014.<sup>28</sup> Many occupations for which H-1B's are routinely requested are found within the broader category of Professional and Related Occupations, which has also exhibited low unemployment rates (Figure 2).



Source: Bureau of Labor Statistics and Current Population Survey. Note: Many occupations for which H-1B's are routinely requested are found within the broader category of Professional and Related Occupations. 2004 to 2013 data represent the annual unemployment rate for each year. The 2014 rate is the unemployment rate for January 2014.

- For U.S.-citizen STEM workers with PhDs, the 2011 unemployment rate was only [3.15 percent](#), and for those with master's degrees it was 3.4 percent.<sup>29</sup> Unemployment among Petroleum Engineers was 0.1 percent, for Computer Network Architects it was 0.4 percent, and for Nuclear Engineers it was 0.5 percent.<sup>30</sup>

- Those STEM fields in which large shares of workers are foreign-born have low unemployment rates among native-born workers. For instance, although nearly 25 percent of Medical Scientists are foreign-born, native-born Medical Scientists have an unemployment rate of just [3.4 percent](#).<sup>31</sup>

*The multiplier effect of innovation industries for broader job creation in particular localities should not be overlooked when examining employment impacts of the H-1B high-skilled visa.*

- Long-term research shows that, in addition to bringing more jobs and higher salaries to communities where they cluster, the impact and success of innovative industries in localities has a profound [multiplier effect](#).<sup>32</sup>
  - Jobs in the innovation economy generate a disproportionate number of local jobs in other industries. An analysis of 11 million American workers in [320 metropolitan areas](#) shows that each new high-tech job in a metropolitan area creates five additional long-term local jobs outside of the high-tech sector.<sup>33</sup>
  - Furthermore, the [five new jobs](#) created for each new high-tech job benefit a diverse group of workers: two new jobs for professional workers such as attorneys and doctors, and three new positions in nonprofessional occupations such as service industry jobs.<sup>34</sup> In many U.S. metropolitan areas, the [innovation economy](#), and the high-skilled jobs related to it, drive prosperity for a broader base of workers living in the region.<sup>35</sup>
  - New, innovative startups are the [drivers of U.S. job growth](#).<sup>36</sup> Such startups, if successful, go on to create many more jobs in the U.S. But their success is hindered by STEM labor force gaps and a cumbersome process for hiring talent that our byzantine immigration system imposes.

## **Conclusion**

*H-1B visa reforms are part of a larger effort to use immigration in smart and effective ways to create a more robust economy.*

Beyond the short-term needs that the H-1B program is designed to address, there is a broader long-term demand for highly-skilled STEM workers in the United States. Employer demand for high-skilled green cards also outstrips supply, creating backlogs that can extend for ten years or more for professionals of certain nationalities. Creating more green cards for highly skilled immigrants, including for foreign-born graduates from U.S. universities, eliminating country-based caps, and exploring ways for immigrants already living in the U.S. with foreign-earned credentials and licenses to practice their profession, are important components of reforming our immigration system to meet the needs of a 21<sup>st</sup> century economy. These efforts should occur alongside broader efforts at strengthening STEM education at the K-12 and post-secondary levels in the U.S., and cultivating interest in STEM fields from an early age among the broader population, including among women and minority populations traditionally under-represented in

STEM occupations. Immigration and education reforms together will help solve the problem of future flow in STEM fields.

The H-1B program highlights many of the flaws in our current immigration system, particularly the lack of flexibility in responding to fluctuations in the economy, changes in business models, and evolving business needs. Filling critical positions becomes nothing more than a roll of the dice, putting workers and their families, employers, and the country as a whole at risk of losing out on greater economic growth and prosperity. Multiply this problem many times over in the nation's handling of other kinds of employment and family visas and the failure to fully utilize the skills and talents of currently undocumented workers, and it becomes clear how far we have to go before we can take full advantage of the opportunities a robust and functional immigration system presents.

## Endnotes

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<sup>1</sup> Immigration Policy Center, "[Employment-Based Immigration in the United States: A Fact Sheet](#)" (Washington, D.C.: American Immigration Council, 2011).

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> U.S. Citizenship and Immigration Services, "[USCIS Reaches FY 2014 H-1B Cap](#)" (Washington, D.C.: U.S. Citizenship and Immigration Services, 2013).

<sup>5</sup> U.S. Citizenship and Immigration Services, "[USCIS Reaches H-1B Cap](#)," 2005; U.S. Citizenship and Immigration Services, "[USCIS Reaches H-1B Cap](#)," 2006; U.S. Citizenship and Immigration Services, "[USCIS Updates Count of FY 2008 H-1B Cap Filings](#)," 2007; U.S. Citizenship and Immigration Services, "[USCIS Reaches FY 2009 H-1B Cap](#)," 2008; U.S. Citizenship and Immigration Services, "[USCIS Reaches FY 2010 H-1B Cap](#)," 2009; U.S. Citizenship and Immigration Services, "[USCIS Reaches FY 2011 H-1B Cap](#)," 2010; U.S. Citizenship and Immigration Services, "[USCIS Reaches Fiscal Year 2012 H-1B Cap](#)," 2011; U.S. Citizenship and Immigration Services, "[USCIS Reaches Fiscal Year 2013 H-1B Cap](#)," 2012; U.S. Citizenship and Immigration Services, "[USCIS Reaches FY 2014 H-1B Cap](#)," 2013.

<sup>6</sup> U.S. Citizenship and Immigration Services, "[USCIS Reaches FY 2014 H-1B Cap](#)" (Washington, D.C.: U.S. Citizenship and Immigration Services, 2013).

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Madeline Zavodny, "[Immigration and American Jobs](#)" (Washington, DC: American Enterprise Institute for Public Policy Research and the Partnership for a New American Economy, 2011); Marshall Fitz, "[Immigration for Innovation: How to Attract the World's Best Talent While Ensuring America Remains the Land of Opportunity for All](#)" (Washington, DC: Center for American Progress, 2012); Jennifer Hunt, "[Which Immigrants Are Most Innovative and Entrepreneurial? Distinctions by Entry Visa](#)" (Cambridge, MA: National Bureau of Economic Research, 2009); Alex Nowrasteh, "[H-1B Visas: A Case for Open Immigration of Highly Skilled Foreign Workers](#)" (Washington, DC: Competitive Enterprise Institute, 2010); Stuart Anderson, "[The Global Battle for Talent and People](#)" (Washington, DC: Immigration Policy Center, 2003); Darrell M. West, [Brain Gain: Rethinking U.S. Immigration Policy](#) (Washington, DC: The Brookings Institution, 2010); B. Lindsay Lowell, "[H-1B Temporary Workers: Estimating the Population](#)," Working Paper 12 (La Jolla, CA: The Center for Comparative Immigration Studies, 2000); William R. Kerr and William F. Lincoln, "[The Supply Side of Innovation: H-1B Visa Reforms and US Ethnic Invention](#)," Working Paper 09-005 (Boston, MA: Harvard Business School, 2008); Hal Salzman, Daniel Kuehn, and B. Lindsay Lowell, "[Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends](#)" (Washington, DC: Economic Policy Institute, 2013).

<sup>10</sup> Neil G. Ruiz, Jill H. Wilson, and Shyamali Choudhury, "[The Search for Skills: Demand for H-1B Immigrant Workers in U.S. Metropolitan Areas](#)," (Washington, DC: The Brookings Institution, 2012).

<sup>11</sup> Ibid.

<sup>12</sup> Giovanni Peri, Kevin Shih and Chad Sparber, "[STEM Workers, H1B Visas and Productivity in US Cities](#)" (Norface Migration, 2013).

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- <sup>13</sup> Jonathan T. Rothwell and Neil G. Ruiz, "[H-1B Visas and the Stem Shortage](#)" (Washington, DC: The Brookings Institution, 2013).
- <sup>14</sup> Jonathan Rothwell, "[The Need for More STEM Workers](#)" (Washington, DC: The Brookings Institution, 2012).
- <sup>15</sup> Anthony P. Carnevale, Nicole Smith, and Michelle Melton, "[STEM: Science, Technology, Engineering, Mathematics](#)" (Washington, DC: Center on Education and the Workforce, Georgetown University, 2011).
- <sup>16</sup> Microsoft Corporation, "[A National Talent Strategy: Ideas for Securing U.S. Competitiveness and Economic Growth](#)" (Seattle: Microsoft Corporation, 2012).
- <sup>17</sup> Silicon Valley Leadership Group, "[Over 100 leading tech executives urge President Obama and Congress to enact high-skilled immigration reform](#)" (Washington, DC: Silicon Valley Leadership Group, 2013).
- <sup>18</sup> Jonathan Rothwell and Neil G. Ruiz, "[H-1B Visas and the STEM Shortage: A Research Brief](#)" (Washington, DC: The Brookings Institution, 2013).
- <sup>19</sup> Giovanni Peri, Kevin Shih, and Chad Sparber, "[STEM Workers, H1B Visas and Productivity in US Cities](#)" (London: Norface Migration, 2013).
- <sup>20</sup> Ibid.
- <sup>21</sup> Ibid.
- <sup>22</sup> Jonathan T. Rothwell and Neil G. Ruiz, "[H-1B Visas and the Stem Shortage: A Research Brief](#)" (Washington, DC: The Brookings Institution, 2013).
- <sup>23</sup> Ibid.
- <sup>24</sup> Ibid.
- <sup>25</sup> Jonathan T. Rothwell and Neil G. Ruiz, "[H-1B Visas and the Stem Shortage: A Research Brief](#)" (Washington, DC: The Brookings Institution, 2013).
- <sup>26</sup> Ibid.
- <sup>27</sup> Ibid.
- <sup>28</sup> Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce, "[Help Wanted: The Role of Foreign Workers in the Innovation Economy](#)" (Washington, DC: December 2012), p. 3.
- <sup>29</sup> Ibid.
- <sup>30</sup> Ibid.
- <sup>31</sup> Ibid.
- <sup>32</sup> Mark Muro, "[Multiplier Effects: Connecting the Innovation and Opportunity Agendas](#)" (Washington, DC: The Brookings Institution, August 23, 2012).
- <sup>33</sup> Enrico Moretti, [The New Geography of Jobs](#) (New York, NY: Houghton Mifflin, 2012).
- <sup>34</sup> Ibid.
- <sup>35</sup> Jonathan Rothwell, "[Regional Inequality and 'The New Geography of Jobs'](#)" (Washington, DC: The Brookings Institution, August 7, 2012).
- <sup>36</sup> Will Yakowicz, "[Young businesses, not small businesses, create jobs](#)" (New York, NY: *Inc. Magazine*, February 25, 2014).