

NATIONAL FOUNDATION FOR AMERICAN POLICY

NFAP POLICY BRIEF » MARCH 2008

H-1B VISAS AND JOB CREATION

EXECUTIVE SUMMARY

New research shows that hiring H-1B visa holders is associated with increases in employment at U.S. technology companies, undermining the assertion of critics that foreign-born professionals harm the job prospects of Americans. The research contributes to our understanding of the dynamics of company hiring and addresses arguments made to justify current strict limitations on hiring talented international students and other foreign nationals in the United States.

The highlights of the research:

- Examining H-1B filings and year-by-year job totals for the technology companies in the S&P 500, the National Foundation for American Policy (NFAP) used a regression model that controls for both general market conditions and firm size and found that there is a positive and statistically significant association between the number of positions requested in H-1B labor condition applications and the percentage change in total employment. The data show that for every H-1B position requested, U.S. technology companies increase their employment by 5 workers.
- For technology firms with fewer than 5,000 employees, each H-1B position requested in labor condition applications was associated with an increase of employment of 7.5 workers. This is particularly remarkable since the actual number of individuals hired on H-1B visas is likely to be much lower than the total number of applications filed with the Department of Labor.
- The research found that even if increased hiring of both H-1Bs and other workers are both influenced primarily by business opportunities specific to the firm it would still mean new H-1B professionals are complementing other U.S. hires, rather than displacing them, as critics allege.
- There are empirical reasons to believe these findings demonstrate new opportunities being created for U.S. workers by the availability of foreign high-skilled labor, rather than a substitution. After falling in 2002, technology company employment increased at a faster rate in 2003, 2004 and 2005. Thus it is not surprising that statistical controls for the year of the data had a large effect upon our estimates of the percentage change in employment at individual companies. But these same statistical controls had little effect on the relationship we found between H-1Bs and total employment, which stayed steady at a ratio of approximately 5 new workers for every H-1B position requested (and 7 to 1 for employers with 5,000 or fewer employees). The average percentage change in employment varies a great deal over the years examined (from -1.7% in 2002 to 9.3% in 2005), which suggests that changes in overall business conditions for technology companies has little effect on the relationship between H-1B applications and total hiring.

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- Employers that reduced employment reduced it less if they had filed for H-1Bs visas, according to the analysis. Examining companies in the sample that had layoffs, the regression results found a positive association between H-1B positions requested and employment. For every H-1B position requested on a labor condition application, total employment is estimated to be 2 workers more than it otherwise would have been.
- If the proposition was true that companies hire H-1B professionals because they're cheaper, then when businesses hit hard times they should hire more H-1Bs to save money. However, the analysis shows that, overall, H-1B filings at U.S. technologies declined when companies hit hard times, undermining the perennial assertion that H-1Bs are hired as "cheap labor."
- Preventing companies from hiring foreign nationals by maintaining an artificially low limit on H-1B visas is likely to produce the unintended consequence of pushing more work to other countries. Sixty-five percent of technology companies responding to an NFAP survey said in response to the lack of H-1B visas they had "hired more people (or outsourced work) outside the United States." This is significant in that even if those companies responding to the survey are heavier users of H-1B visas it means that these are the companies most likely to hire outside the United States in response to an insufficient supply of skilled visas for foreign nationals. "As a global company, Google is fortunate to be able to have employees work for us in other countries if they are not allowed to stay in the U.S.," noted a Google executive in Congressional testimony.
- Fifty-two percent of companies responding to the survey believed that for every H-1B professional they hired it created one or more complementary jobs at their firms or in the U.S. economy. Twenty-two percent thought the hiring of an H-1B visa holder created 10 or more jobs. Seventy-four percent of company respondents said an inability to fill positions because of the lack of H-1B visas has potentially affected their "company's competitiveness against foreign competitors or in international markets."
- Google, one of the most innovative companies in the world, says it could not produce its innovations in the United States if not for access to H-1B visa holders. In a hearing before the House Judiciary Immigration Subcommittee, Laszlo Bock, Vice-President for People Operations at Google, testified, "If U.S. employers are unable to hire those who are graduating from our universities, foreign competitors will. The U.S. scientific, engineering, and tech communities cannot hope to maintain their present position of international leadership if they are unable to hire and retain highly educated foreign talent. We also

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cannot hope to grow our economy and create more jobs if we are ceding leadership in innovation to other nations.”

In reviewing the analysis, one might ask whether if companies hired 5 workers in addition to the H-1B professional, does that mean that these technology companies would have hired 6 workers and no H-1Bs if no H-1Bs were permitted in the country? The answer is “no.” If companies went out of their way to favor H-1Bs over other workers one would find employers trying to hire H-1Bs regardless of how total employment was changing in the company. Therefore, we would not find a positive correlation between H-1B applications and total employment, which the data clearly show. (Additional evidence that U.S. companies do not hire H-1Bs simply because they are available could be seen in 2002 and 2003, when the annual numerical quota on H-1B visas was set at 195,000 but employers collectively used only 79,100 and 78,000 against the quota, respectively, in those years.)

The research presented here shows H-1B visa holders are associated with increased hiring at U.S. technology companies. The survey results indicate at least a portion of technology companies increase hiring overseas or move more work out of the country in response to a lack of H-1B visas. This is further evidence that the current restrictions on high skill immigration are counterproductive and the result of legislative inertia, rather than legitimate concerns.

RESEARCH SHOWS H-1B USE ASSOCIATED WITH INCREASES IN COMPANY EMPLOYMENT

One issue that arises in the debate over immigration is the impact of skilled foreign nationals on hiring at U.S. companies. Critics allege that U.S. employers hire H-1B visa holders instead of – rather than in addition to – U.S. citizens. In fact, it is even alleged that U.S. workers are regularly fired so that companies may hire foreign nationals on H-1B visas, who it is asserted work for less money. NFAP has produced a number of papers that include government and other data questioning whether H-1Bs are paid less than comparable U.S. professionals. Under current law, H-1B professionals must be paid the *higher* of the prevailing wage or the actual wage paid to similarly employed Americans. Moreover, on top of that requirement, companies generally pay approximately \$6,000 in legal and government-imposed fees when hiring an H-1B visa holder (and up to \$12,000 more to sponsor an individual for permanent residence). Government enforcement data do not indicate widespread abuse or even vast underpayment in most of the relatively small number of cases where H-1B professionals were paid improperly.¹

To examine the impact of H-1B visa holders closely from an additional angle, NFAP conducted research by examining filings for H-1B positions in labor condition applications through the Department of Labor for 2001 through 2005 by technology companies in the S&P (Standard and Poor's) 500. This publicly available data is useful to discover whether filings rose or fell from one year to the next, although the number of certifications does not correspond precisely with the total individuals a company hired on H-1B petitions in a given year.² Regressions were run against publicly available employment data for each of the 76 technology companies in the S&P 500. While the employment data generally included employment figures that were not just domestic, the data are useful to ascertain whether a company's labor force was rising or falling in the years examined.³

As noted, data were used on total employment and H-1B labor condition applications between 2001 and 2005, allowing calculation of employment growth for 2002-2005. Since there are long delays between the filing of a labor condition application and the actual receipt of an H-1B visa, the percentage change in employment in a year was analyzed in relation to the number of positions requested in labor condition applications in the previous year. In all specifications of the regression model, there is a positive and statistically significant association between the number of positions requested in H-1B labor condition applications in the previous year and the percentage change in total employment.

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Five New Workers Hired For Each H-1B Position Requested in Labor Condition Applications: A year-by-year examination of H-1B filings and employment growth at the technology companies in the S&P 500 shows H-1B use is associated with increased hiring at tech companies. Across all years and all firms in the sample employment actually increased by an average of 67 employees for each H-1B position requested in labor condition applications in the previous year. This reflects the recovery of the high-tech sector since 2001 and certainly should not all be attributed to the ability of the companies to hire H-1B workers. However, the regression model, which controls for both general market conditions and firm size, still finds that requests for H-1B positions were associated with an increase in total employment more than five times the size of the H-1B request on labor condition applications.⁴

In other words, the data show that for every H-1B position requested, U.S. technology companies increase their employment by 5 workers. This is particularly remarkable since the actual number of people hired on H-1B visas is likely to be much lower than the total number of applications filed with the Department of Labor.

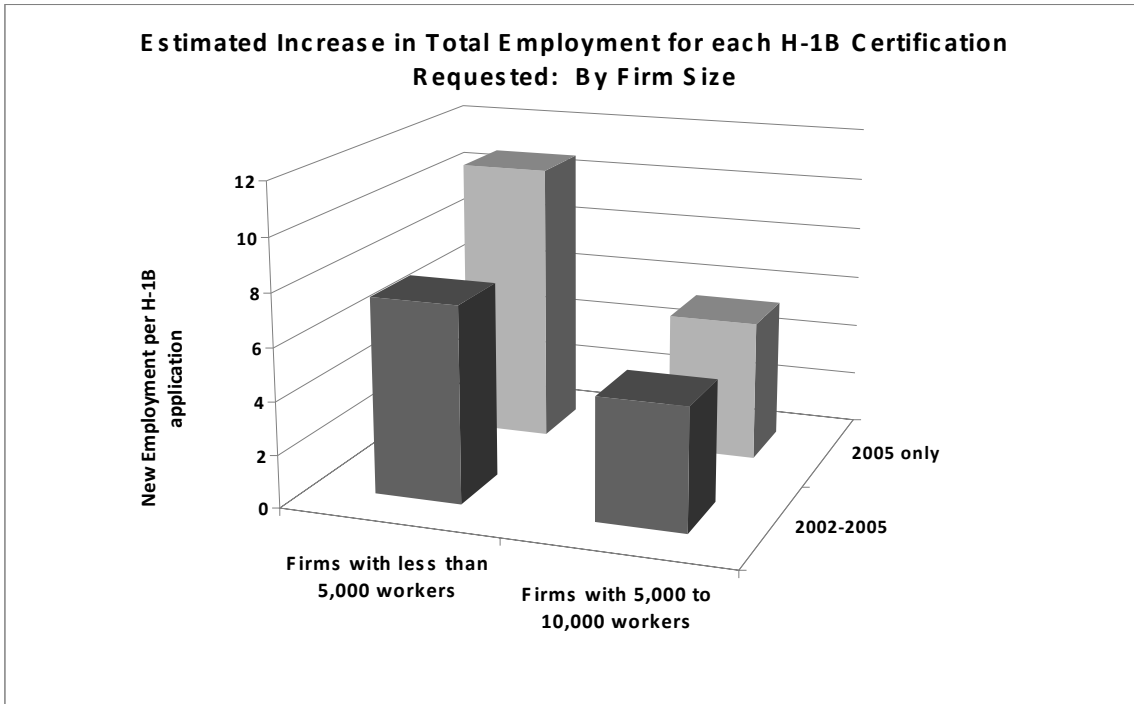
Of course, most changes in a company's employment are not driven solely by their temporary-visa high-skilled hires. It is likely that increased hiring of both H-1Bs and other workers are both influenced primarily by business opportunities specific to the firm. But if this is the case, then new H-1B workers are complementing other U.S. hires, not displacing them.

Smaller companies: While no technology company in the 2005 S&P 500 can properly be called small, not all were large in 2001, and even in 2005 total employment ranged from less than 1,000 to 366,000 workers. Over this sample, H-1B certifications are most strongly associated with employment increases for smaller companies (see figure on next page). For firms with fewer than 5,000 employees, each H-1B position requested in labor condition applications was associated with an increase of employment of 7.5 workers compared to 4.7 additional workers at firms employing between 5,000 and 10,000 workers.⁵ Looking just at the most recent year in the data, 2005, an H-1B certification was associated with 10.7 more workers for firms with less than 10,000 employees, with 5.4 additional workers for firms with between 5,000 and 10,000 workers, and 4.0 additional workers for firms with greater than 10,000 workers.

If smaller firms are more likely to be involved in job-creating innovation, then that may explain why H-1Bs are more important to employment growth in such firms. This study looked only at S&P 500 companies, so it is not possible to say whether H-1Bs have an even stronger association with growth at startups and smaller technology companies.

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Overall, the research addresses arguments that hiring H-1B professionals leads to significant job losses for Americans or that H-1Bs are “taking” jobs from U.S. workers. As noted in another section of this report, a number of tech companies believe hiring foreign nationals creates more employment for Americans.



Source: National Foundation for American Policy; Hoover's, U.S. Department of Labor. Notes: Data are for S&P 500 technology companies. Labor condition applications (LCA) are for the prior year.

One might ask whether if companies hired 5 workers in addition to the H-1B professional, does that mean that a typical technology company would have hired 6 workers and no H-1Bs if no H-1Bs were permitted in the country? The answer is “no.” If companies went out of their way to favor H-1Bs over other workers one would find employers trying to hire H-1Bs regardless of how total employment was changing in the company. Therefore, we would not find a positive correlation between H-1B applications and total employment, which the data clearly show. (Additional evidence that U.S. companies do not hire H-1Bs simply because they are available could be seen in 2002 and 2003, when the annual numerical quota on H-1B visas was set at 195,000 but employers collectively used only 79,100 and 78,000 H-1B petitions counted against the quota, respectively, in those years.)

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There are empirical reasons to believe these findings demonstrate new opportunities being created for U.S. workers by the availability of foreign high-skilled labor, rather than a substitution. After falling in 2002, technology company employment increased at a faster rate in 2003, 2004 and 2005. Thus it is not surprising that statistical controls for the year of the data had a large effect upon our estimates of the percentage change in employment at individual companies. But these same statistical controls had little effect on the relationship we found between H-1Bs and total employment, which stayed steady at a ratio of approximately 5 new workers for every H-1B position requested (and 7 to 1 for employers with 5,000 or fewer employees). The average percentage change in employment varies a great deal over the years examined (from -1.7% in 2002 to 9.3% in 2005), which suggests that changes in overall business conditions for technology companies has little effect on the relationship between H-1B applications and total hiring.

COMPANIES HIRE FEWER, NOT MORE, H-1BS IN HARDER TIMES

If the proposition were true that companies hire H-1B professionals because they're cheaper, then when businesses hit hard times they would hire more H-1Bs to save money. However, the evidence shows that is not the case. H-1B filings at U.S. technology companies declined when companies were losing money or hit hard times. Again, if critics were right and employers hired foreign nationals on H-1B visas because they would work for less, then companies would increase their hiring of H-1Bs to save money in hard times. The evidence is that employers do no such thing.

Companies with declining employment: While overall employment was up for firms in the sample, some of the firms did have declining employment in at least some of the years. On average these firms did apply for certification for 74 H-1B positions (fewer than otherwise) even while their total employment declined on average by 2,545 workers. It is an understandable source of frustration for some workers when any type of new hiring and layoffs occur simultaneously, even if they involve unrelated positions in different parts of a company. But did new H-1B hiring make the layoffs worse? In fact, the regression results suggest the reverse – estimates made using just companies reducing total employment still find a positive association between certification requests and employment. For every H-1B position requested on a labor condition application, total employment is estimated to be 2 workers more than it otherwise would have been.⁶ Even when a company is reducing employment among workers with some occupations and skill levels, it might still need more workers with key technical skills. Being able to fill needed high-skilled positions may allow a company to maintain or expand certain business activities. These results further call into question the premise behind proposals to mandate U.S. employers petitioning for skilled foreign nationals submit to broad “non-displacement” attestations.

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In sum, both among firms reducing employment and firms increasing employment, requests for positions in H-1B labor condition applications are associated with employment gains. In the case of firms reducing employment, this suggests that additional H-1B applications are associated with smaller losses.

SURVEYING COMPANIES

As a companion to the research on H-1Bs and job creation and to gain a better understanding of how companies act in response to job openings – and their possible connection to U.S. immigration policy – NFAP surveyed 120 company members of TechNet, the Semiconductor Industry Association (SIA) and the larger corporate members of SEMI (Semiconductor Equipment and Materials International). We garnered a response rate of 22 percent, for a total of 27 company respondents. While these results cannot necessarily be extrapolated to all technology companies due to sample size and possible self-selection among respondents, the data provide new information worth analyzing regarding larger technology companies. The results are also similar to those found in a survey of privately held venture-backed companies conducted by the National Venture Capital Association.⁷

Among the results of the survey:

Outsourcing and Hiring More Individuals Outside the United States. Preventing companies from hiring foreign nationals by maintaining the current low limit on H-1B visas is likely to produce the unintended consequence of pushing more work to other countries. When asked, “Which of the following your company has done in response to the lack of H-1B visas to fill positions in the U.S.?” 65 percent of the companies said they “Hired more people (or outsourced work) outside the United States.” This is significant in that even if those companies responding to the survey are heavier users of H-1B visas it means that these are the companies most likely to hire outside the United States in response to an insufficient supply of skilled visas for foreign nationals.

Delaying or Changing Plans for Projects. Forty-six percent of companies said they “delayed or changed plans for projects” in response to the lack of H-1B visas. Thirty-eight percent responded that they “needed to alter the plans, location or growth of a product or service” due to the lack of H-1Bs.

Inability to Fill Positions Affecting Competitiveness. Seventy-four percent of company respondents said an inability to fill positions because of the lack of H-1B visas has potentially affected their “company’s competitiveness against foreign competitors or in international markets.”

H-1Bs Creating Complementary Jobs. Fifty-two percent of companies believed that for every H-1B professional they hired it created one or more complementary jobs at their firms or in the U.S. economy. Twenty-two percent

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thought the hiring of an H-1B visa holder created 10 or more jobs. Robert Farnsworth of Sonnet Technologies said, “We hired an H-1B from Japan who developed the Japanese market for us. We are a manufacturer and this resulted in the hiring of 10 production personnel to support the business.”⁸

It is apparent that employers view restrictive immigration policies as harmful to their companies. “Due to the lack of engineering grads in U.S. schools that are citizens, the talent pool we can't keep because of limited H-1Bs has affected our company's culture from becoming more diverse and globally attune,” said Micron Technology's Vice President for Human Resources Pat Otte. “Gurtej Sandhu is the 4th or 5th living patent holder in the world and works in our R&D Dept. At an IP driven company, we thank God for his visa.”⁹

Jerry Cutini is Chairman, President and CEO of Aviza Technology, a designer and manufacturer of advanced semiconductor capital equipment. He views his company's ability to hire from a diverse labor pool important to Aviza's success. “A significant part of our technical community originated from outside the U.S. By enabling a process to bring them into the country, they have allowed us to improve our technical capabilities and thereby allowed us to create products that can be exported from the US into other countries.”¹⁰

THE CASE OF GOOGLE

Google is considered one of the world's most innovative companies. Based in Mountain View, California, the company has transformed Internet commerce and advertising, as well as the way many people utilize information on the Internet. Although the company is American, founded by Larry Page and Russian-born immigrant Sergey Brin, those who lead the firm concede it would not be the same company if it did not hire, in addition to Americans, many outstanding individuals born outside the United States.

“Google's hiring process is rigorous, and we make great efforts to uncover the most talented employees we can find. Often times, many of these exceptional employees were born here in the United States and have spent their whole lives here. But in other cases, the most talented software engineer or product manager we can find happens to have been born elsewhere,” according to Laszlo Bock, Vice-President for People Operations at Google. “As a result, Google depends on programs like the H-1B visa for highly skilled workers.”¹¹

In testimony before the House Judiciary Subcommittee on Immigration, Laszlo Bock stated that about 8 percent of Google's U.S.-based employees are working on H-1B temporary visas from over 80 different countries. “So, while nine out of 10 of our employees are citizens or permanent residents, our need to find the specialized skills required to run our business successfully requires us to look at candidates from around the globe – many of whom are already in the U.S. studying at one of our great universities,” said Bock. “It is no stretch to say that

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without these employees, we might not be able to develop future revolutionary products like the next Gmail or Google Earth.”¹²

At the hearing, Bock shared two examples of H-1B visa holders at Google:

“• Orkut Buyukkokten was born in Konya, Turkey, and later received his Ph.D. in computer science from Stanford University. He joined Google as a software engineer in 2002 through the H-1B visa program. Every engineer at Google is allotted what we call "20 percent time," giving them the freedom to spend one day a week pursuing whatever projects interest them. In his 20 percent time, Orkut developed and programmed a new social networking service, which Google later launched publicly and dubbed – you guessed it – "orkut." Today, orkut – the web service – has tens of millions of users worldwide, and is so popular in Brazil that Orkut – the person – was treated as a celebrity on a recent visit there. After spending four years in the U.S. on an H-1B visa, Orkut recently received his green card for permanent residency.

“• Krishna Bharat joined Google even earlier, in 1999, and also through the H-1B program. A native of India, he received his Ph.D. from Georgia Tech in human computer interaction. His work on web search at DEC Systems Research Center and at Google earned him several patents, and he is a noted authority on search engine technology. Krishna was one of the chief creators of Google News, our service that aggregates more than 4,500 English-language news websites around the world. Today, Krishna serves as Google's Principal Scientist, and he, too, has received his green card for permanent residency.

“Without Orkut and Krishna—and many, many other employees—Google would not be able to offer innovative and useful new products to our users. Immigration laws that enable us to attract and retain highly skilled workers, regardless of their country of origin, make that possible.”¹³

As Bock pointed out in his testimony, Google does not hire foreign nationals instead of Americans but *in addition* to them. “We believe that it is in the best interests of the United States to welcome into our workforce talented individuals who happen to have been born elsewhere, rather than send them back to their countries of origin,” said Bock. “But this doesn't mean we don't recruit here in the U.S., or that American workers are being left behind. To the contrary, we are creating jobs here in the U.S. every day.”

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Google more than doubled employment from 5,700 to 12,200 between 2004 and 2007. At times the company has added 500 employees each month. Currently the company has more than 900 open positions in the United States.¹⁴

Bock noted, “But we’re not the only ones recruiting talented engineers, scientists, and mathematicians. The fact is that we are in a fierce worldwide competition for top talent unlike ever before. As companies in India, China, and other countries step up efforts to attract highly skilled employees, the United States must continue to focus on attracting and retaining these great minds . . . You might wonder why we care so much, when we have a global presence and can locate engineers in foreign facilities. Indeed, as a global company, Google is fortunate to be able to have employees work for us in other countries if they are not allowed to stay in the U.S. It is vital to have a local presence in other countries, to help tailor our products and services for our international users.”

“However, many of our core products are created and improved here in the U.S., and we believe that worker satisfaction is higher when employees can work in the location they prefer. Being able to have H-1B visa holders remain in the U.S., building our products and expanding our business, also translates into more jobs and greater economic growth here at home,” said Bock. “America’s edge in the world economy depends on the ability of U.S. companies to innovate and create the next generation of must-have products and services. And that ability to innovate and create in turn depends on having the best and brightest workers.”¹⁵

CONCLUSION

The argument that companies only hire skilled foreign nationals because they will “work cheaper” is based largely on the questionable assumption that people not born in the United States have no value in the marketplace unless they work for less than Americans.

Based on a regression model that controls for both general market conditions and firm size the National Foundation for American Policy (NFAP) found that requests for H-1B certifications by U.S. technology companies are associated with an increase in total employment more than five times the size of the H-1B request. The data show that for every H-1B position requested, U.S. technology companies in the S&P 500 increase their employment by 5 workers. For technology firms with fewer than 5,000 employees, each H-1B position requested in labor condition applications was associated with an increase of employment of 7.5 workers. This is particularly remarkable since the actual number of individuals hired on H-1B visas is likely to be much lower than the total number of applications. The research also showed employers that reduced employment reduced it less if they had filed for H-1Bs visas.

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Preventing companies from hiring foreign nationals by maintaining an artificially low limit on H-1B visas is likely to produce the unintended consequence of pushing more work to other countries. Sixty-five percent of technology companies responding to an NFAP survey said they had "hired more people (or outsourced work) outside the United States" in response to the lack of H-1B visas.

In a hearing before the House Judiciary Immigration Subcommittee, Laszlo Bock, Vice-President for People Operations at Google, testified, "If U.S. employers are unable to hire those who are graduating from our universities, foreign competitors will. The U.S. scientific, engineering, and tech communities cannot hope to maintain their present position of international leadership if they are unable to hire and retain highly educated foreign talent. We also cannot hope to grow our economy and create more jobs if we are ceding leadership in innovation to other nations."¹⁶

The research presented here demonstrates that H-1B visa holders are associated with increased hiring at U.S. technology companies. This is further evidence that the current restrictions on high skill immigration are counterproductive and the result of legislative inertia, rather than legitimate concerns.

APPENDIX

Technical Notes On The Analysis Of Changes In Employment And Requests For H-1B Labor Certifications

Regression analyses of the relationship between the number of positions in H-1B labor condition applications (LCA) filed with the Department of Labor by technology firms among the S&P 500 and subsequent growth in total employment are shown in tables AT-1, AT-2, and AT-3. Labor condition applications are certification requests whereby an employer seeks Department of Labor approval for positions in particular geographic locations, specifying the minimum salary level that will be paid for those positions. The dependent variable in each regression is the percentage change in total employment at each company over the previous year. In all specifications of the regression model, there is a positive and statistically significant association between the number of positions requested in H-1B labor condition applications in the previous year and the percentage change in total employment.

Data were used on total employment and H-1B labor condition applications between 2001 and 2005, allowing calculation of employment growth for 2002-2005. Since there are often long delays between the filing of a labor condition application and the actual receipt of an H-1B petition, the percentage change in employment in a year was analyzed in relation to the number of positions requested in labor condition applications in the previous year.

The percentage growth in employment in year t is calculated as:

$$100 \times ((\text{Emp}_t - \text{Emp}_{t-1}) / \text{Emp}_{t-1})$$

And previous-year LCAs as a percent of previous-year employment is calculated as:

$$100 \times (\text{LCA}_{t-1} / \text{Emp}_{t-1})$$

There is nothing unusual in either calculation, but using these particular forms means that the main variables on both sides of the regression equation have the same denominator (total employment in the previous year) and thus the regression coefficient can be interpreted as the number of extra employees associated with each additional H-1B position requested the previous year.

Thus, as shown in regression 1 in table AT-1, a simple regression of just the two variables suggests an increase of 5.4 employees for every H-1B position requested the previous year. This coefficient is highly statistically significant. In part, a statistically significant positive coefficient may reflect extra employment that is possible only because a foreign worker was available to fill a critical need that was limiting expansion of the firm. It is also likely

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that an increase in business opportunities would lead a firm to increase employment of both U.S. and H-1B workers, which would also lead to a positive coefficient. In contrast, H-1B hiring done primarily to replace U.S. workers and to cut costs would not be consistent with a positive coefficient.

The R-squared, usually interpreted as the percentage of variation explained by the model, is .0687 for this simple equation – suggesting that 6.9 percent of employment changes are “explained” by changed in H-1B requests. This relatively low R-squared is to be expected – it would be inaccurate to claim that H-1B availability is more important to the growth of large technology firms than factors like demand for its products and the performance of its competitors, but it is consistent with H-1Bs playing an important role.

It is also important to note that LCAs requested are not actual H-1B hires. Each year there are many more H-1B positions on labor condition applications approved than there are available visas. In addition, not all visas issued are used, as individuals sometimes accept job offers in their home country or in other countries. Thus the number of labor condition applications will be an imperfect indicator of actual H-1B hires and regression coefficients will understate the relationship between actual H-1B hiring and changes in total employment.

Other specifications of the regression model are shown in regressions 2 and 3 of table AT-1. Controlling for size of the firm (total employment in the previous year in thousands) and for the year of the observation. To the extent that the general growth of opportunities in the technology sector differ from one year to the next, this will be captured the inclusion of dummy variables for 2003, 2004, and 2005. The coefficients on these year dummies are interpretable as differences in employment growth between each of these years and employment growth in 2002. While these additional variables do show the general upward trend in the technology industry during this period, their effect upon the estimated effect of certification application is small: with 5.1 additional workers still estimated for each additional H-1B certification request. Since the average percentage change in employment varies a great deal over these years (from -1.7% in 2002 to 9.3% in 2005), this suggests that changes in overall business conditions for technology companies has little effect on the relationship between H-1B applications and total hiring.

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Table AT-1: Regressions of Employment Changes at S&P-500 Technology Companies: 3 Specifications Over Full Sample, 2002-2005

Dependent variable: Percentage change in total employment

	1	2	3
Certification applications for H-1B positions as a percentage of total employment (previous year numbers)	5.4281***	5.2324***	5.0554***
Previous years total employment / 1000		0.0002	-0.0002
2003			0.0456
2004			0.0950***
2005			0.1052**
c	0.0016	0.0078	-0.0527**
n	299	299	299
R-squared	0.0687	0.0705	0.1162

Notes: ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively

Separate regression estimates for firms gaining employment and losing employment are shown in table AT-2. With the sample size reduced to about half in each case, regression coefficients for H-1B positions in labor condition applications are smaller in size and have a lower statistical significance. However, both among firms reducing employment and firms increasing employment, requests for positions in H-1B labor condition applications are associated with employment gains. In the case of firms reducing employment, this suggests that additional H-1B applications are associated with smaller losses.

Table AT-2: Regressions of Employment Changes at S&P-500 Technology Companies: Employment Gaining and Losing Firms

Dependent variable: Percentage change in total employment

	Firms with employment losses	Firms with employment gains
Certification applications for H-1B positions as a percentage of total employment (previous year numbers)	1.9704*	2.1387*
Previous years total employment / 1000	0.0003*	-0.0004
2003	0.0094	-0.0198
2004	0.01964	-0.0170
2005	0.0289	0.0099
c	-0.1340***	0.1641***
n	136	155
R-squared	-0.1340***	0.1641***

Notes: ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively

Separate regressions for different size firms are shown in table AT-3 for all years, and for 2005 only. These regressions suggest a greater importance of H-1B visas for smaller technology companies (those with fewer than 5000 employees), with an additional H-1B position requested on a labor condition application associated with an employment increase of 7.5 workers, rising to an increase of 10.7 workers when estimated for only 2005.

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Table AT-3: Regressions of Employment Changes at S&P-500 Technology Companies

Dependent variable: Percentage change in total employment

	All years		2005 Only	
	Number of employees		Number of employees	
	< 5,000	5,000-10,000	< 5,000	5,000-10,000
Certification applications for H-1B positions as a percentage of total employment (previous year numbers)	7.4613***	4.6533***	10.7050**	5.3534*
Previous years total employment / 1000	0.0020	-0.0158	6.1018	1.3446
2003	0.1069	0.0032	--	--
2004	0.1274*	0.1087	--	--
2005	0.1617**	0.1153*	--	--
c	-0.0702	0.0191	-13.4342	-8.8677
n	90	61	23	16
R-squared	0.1567	0.1844	0.2721	0.1967

Notes: ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively

END NOTES

¹ See for example *Driving Jobs and Innovation Offshore*, NFAP Policy Brief, December 2007 and *H-1B Professionals and Wages: Setting the Record Straight*, NFAP Policy Brief, March 2006. The reports can be found on the NFAP website at www.nfap.com.

² The Department of Labor's website states, "A Labor Condition Application (LCA) is used by employers as supporting evidence for the petition for an H-1B visa. Only first issuance H-1B visas are subject to the legislated numeric limitation."

³ Employment data were obtained from company filings and Hoover's. Total employment in the data could include global offices for the companies in the sample. S&P 500 membership changes from time to time.

⁴ This basic finding of a five-to-one relationship is very robust across different specifications of the regression: varying only from 5.06 to 5.43 in all regressions that were run on the full sample of companies and years. Regression results are shown in more detail in the Appendix.

⁵ When estimated using all years of data, there was no statistically significant relationship found between H-1B certifications and employment for firms that were already employing more than 10,000 workers. It may be harder to find a relationship statistically for very large firms with multiple lines of business, however a positive effect was found even for very large firms in the most recent year of data.

⁶ For firms with declining employment, there was an estimated 1.97 extra workers employed for each H-1B certification.

⁷ Stuart Anderson and Michaela Platzer, *American Made*, National Venture Capital Association, November 2006.

⁸ Response to NFAP survey.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Testimony of Laszlo Bock before the House Judiciary Subcommittee on Immigration, Citizenship, Refugees, Border Security, and International Law, June 6, 2007.

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid., Google.

¹⁵ Ibid.

¹⁶ Ibid.

ABOUT THE NATIONAL FOUNDATION FOR AMERICAN POLICY

Established in the Fall 2003, the National Foundation for American Policy (NFAP) is a 501(c)(3) non-profit, non-partisan public policy research organization based in Arlington, Virginia focusing on trade, immigration and related issues. The Advisory Board members include Columbia University economist Jagdish Bhagwati, Ohio University economist Richard Vedder and other prominent individuals. Over the past 24 months, NFAP's research has been written about in the *Wall Street Journal*, the *New York Times*, the *Washington Post*, and other major media outlets. The organization's reports can be found at www.nfap.com.