



Jobs Americans Can't Do?

THE MYTH OF A SKILLED WORKER SHORTAGE

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Executive Summary

“The intent is that H-1B visas only be issued if qualified American workers are unable to take the jobs in question...I fully agree that H-1B hires should be a last recourse as a matter of labor policy.”¹

—*Senator Barack Obama, 2007*

Corporate executives in the tech industry have long called for an increase in pliant, lower-cost foreign labor. They argue that the U.S. is failing to produce a sufficient number of talented scientists and engineers. These claims, however, are based upon no actual evidence and do not hold up to scrutiny. Behind the industry’s calls for guest worker programs that attract the “best and brightest” is the reality that U.S. tech companies are cutting wages by discriminating against qualified American workers, with the full complicity of the federal government. Labor market data clearly indicate that the U.S. has no shortage of qualified scientists and engineers, and economic research demonstrates that immigrants do not make any special contribution to innovation. However, the flood of low-wage guest workers harms American workers and may threaten the nation’s future competitiveness.

Skilled guest worker programs are being abused by employers, putting many Americans out of work and denying opportunities to millions of others. Even with unemployment at a 30-year high, corporate executives who use foreign workers to suppress wages in the tech industry have found support on Capitol Hill and in the White House. It goes against all sense of fairness, and it is astounding to realize, that Americans are being denied job opportunities in America while at the same time politicians are calling for the expansion of guest worker programs that will exacerbate this problem. The argument that there exists a shortage of skilled workers in the United States was not true before the recent recession, and certainly is not true now. Simply put, those who promote the idea of a “shortage” of scientists and engineers do so without regard for labor market evidence or the welfare of American workers.

This report contains the following findings:

- There is no evidence that there is, or will exist in the foreseeable future, a shortage of qualified native-born scientists and engineers in the United States.
- The glut of science and engineering (S&E) degree holders in the United States has caused many S&E graduates to seek work in other fields. Less than one-third of S&E degree holders are working in a field closely related to their degree, while 65 percent are either employed in or training for a career in another field within two years of graduating.

- Wages in science, technology, engineering and mathematics (STEM) occupations have not kept pace with those of other college graduates, and in some occupations have actually decreased.
- The Government Accountability Office found that some U.S. employers acknowledged that “H-1B workers were often prepared to work for less money than U.S. workers” and this factored into the employers’ hiring decision.
- Nearly 675,000 H-1B and L-1 visa holders were approved for work in the United States in 2009.
- The Wage and Hour Division of the Department of Labor has never initiated an investigation to ensure that employers are properly paying their H-1B workers.
- 94 percent of H-1B petitions were approved between 2000 and 2009.
- In 2008, the United States Citizenship and Immigration Services (USCIS) found that 21 percent of H-1B petitions contained a violation.
- L-1 approved visas rose by 53 percent from 2000 to 2008.
- From 1999 to 2004, nine of the top ten companies petitioning for L-1 visas were computer and IT (information technology) outsourcing firms.

Introduction

“No one who has come to this question with an open mind has been able to find any objective data suggesting general ‘shortages’ of scientists and engineers.”²

—Dr. Michael S. Teitelbaum, Alfred P. Sloan Foundation

The foreign-born constitute a much larger share of America's science and engineering (S&E) labor force than their share of the labor force as a whole.³ The most recent comprehensive survey by the National Science Foundation (NSF) found that 24 percent of college-educated workers in S&E related fields in 2006 were foreign-born.⁴ By comparison, foreign-born workers made up 16.3 percent of the U.S. labor force in 2007.⁵ This means that a science and engineering worker is about 1.5 times as likely to be foreign-born as the typical labor force participant. However, if guest workers admitted under the H-1B program are excluded, the foreign-born are no more likely to be employed in science, technology, engineering, or mathematic (STEM) occupations than their native-born counterparts.⁶ A great deal of attention is often given to the U.S.' so-called “dependence” on foreign scientists and engineers, but labor market data reveal that the U.S. has an ample supply of domestically-produced STEM workers, and that the disproportionate share of foreign-born is caused by guest worker programs and diminishing career prospects for graduate degree-earners.

Why do the foreign-born make up almost a quarter of our nation's science and engineering workforce while comprising only one-sixth of the labor force? Some claim that this reveals a shortage of natives who are capable of performing these jobs. Of course, convincing policy makers that there is a shortage of workers will always be in the interest of the tech industry so they can continue to have access to cheaper foreign labor. An industry executive or lobbyist's claim that there is a shortage of skilled workers does not mean such a shortage exists. Likewise, the presence of foreign workers in the U.S. labor market does not necessarily mean that foreign workers are *needed* by U.S. employers.

All labor market evidence clearly indicates that there is no shortage in the United States of workers in STEM occupations, those jobs most commonly held by S&E degree holders. The NSF found that in 2006 there were an estimated 4.3 million to 5.8 million people working in the STEM sector, depending on how occupations were classified.⁷ At the same time, the NSF found that there were 16.6 million individuals in the United States who have an S&E degree (including 12.2 million whose highest degree was in S&E).⁸ This means that there are at least two and a half times more individuals in the United States who have an S&E degree than are employed in S&E occupations.

The high ratio of S&E graduates relative to available jobs in those fields is the result of a long-term trend. Between 1985 and 2000, the United States averaged three times more S&E graduates than new job openings each year.⁹ Currently, less than one-third of S&E graduates are working in a STEM field closely related to their degree, while 65 percent of S&E graduates are either employed in or training for another career field within two years.¹⁰

“...the problem may not be that there are too few STEM qualified college graduates, but rather that STEM firms are unable to attract them. Highly qualified students may be choosing a non-STEM job because it pays better, offers a more stable professional career, and [are] perceived as less exposed to competition from low-wage economies.”¹¹

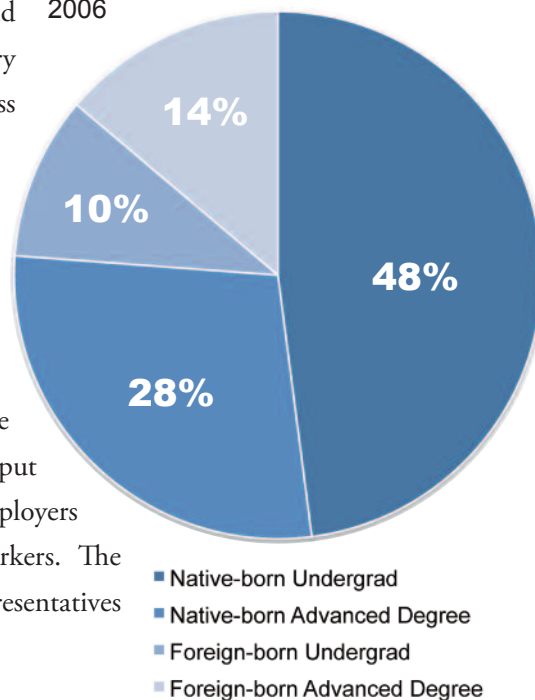
Wage data also reveal an over supply of STEM workers, not a shortage. Wages in STEM occupations have risen more slowly than for college graduates overall, and in some occupations have actually decreased.¹² If there were a shortage of scientists and engineers, wages would be expected to rise faster than in comparable fields. By trying to force more and more workers into a sector that already has an oversupply, the federal government has assured that wages will continue to lag behind other comparable careers.

Other evidence also indicates that there is no shortage of scientists and engineers. In a 2007 report, Duke University’s Vivek Wadhwa and Gary Gereffi found that STEM employers offered signing bonuses much less often than employers in other industries, and that employers were able to fill their job openings extremely quickly.¹³ This evidence led the authors to conclude that there was “no indication of a shortage of engineers in the United States.”¹⁴ Survey data show that S&E executives do not report having trouble hiring high-quality workers.¹⁵

Labor economists agree that market indicators do not suggest any type of labor shortage in STEM fields. As Wharton professor Peter Cappelli put it, “Researchers who study labor markets and representatives of IT employers disagree almost completely as to whether there is a shortage of IT workers. The researchers uniformly believe that there isn’t a shortage while the representatives [of IT employers] vociferously believe that there is.”¹⁶

B. Lindsay Lowell and Hal Salzman, two academics who have studied this issue intensively, are “puzzled about the disregard for the evidence about supply and of simple labor market economics in [reports that claim a shortage]” and warn that supply-side policies “risk creating a bigger pipeline to nonexistent jobs.”¹⁷ If there is any problem within the U.S. S&E labor market, it is not a lack of workers.

Composition of the S&E Labor Force 2006



Shortage of STEM Workers?

“Employers are very quick to raise the specter of a labor shortage, but often it’s another way of saying they can’t find the workers they want at the price they’re paying...they are unwilling to meet the price signal the market is sending, so they seek help in the form of a spigot like immigration.”¹⁸

—Jared Bernstein, former Chief Economic Advisor to Vice President Biden

Tech industry warnings of a “shortage” of workers in the high-skilled labor market do not mean that there is a lack of workers. Business leaders can make valuable contributions to the public discourse, but it is critical to remember that they are an interested party and do not always advocate for the public interest. When employers and the interest groups they fund lament the “shortage” of STEM workers, what they are really complaining about is the wages they are paying those workers, and when they warn that the United States needs more scientists and engineers, they are trying to decrease the cost of labor by increasing the supply of workers — and, in the case of guest workers, cheap and easily exploitable ones. The claim of a “shortage” of STEM workers ignores labor market evidence showing that no such scarcity exists.

If no shortage, why so many foreign workers?

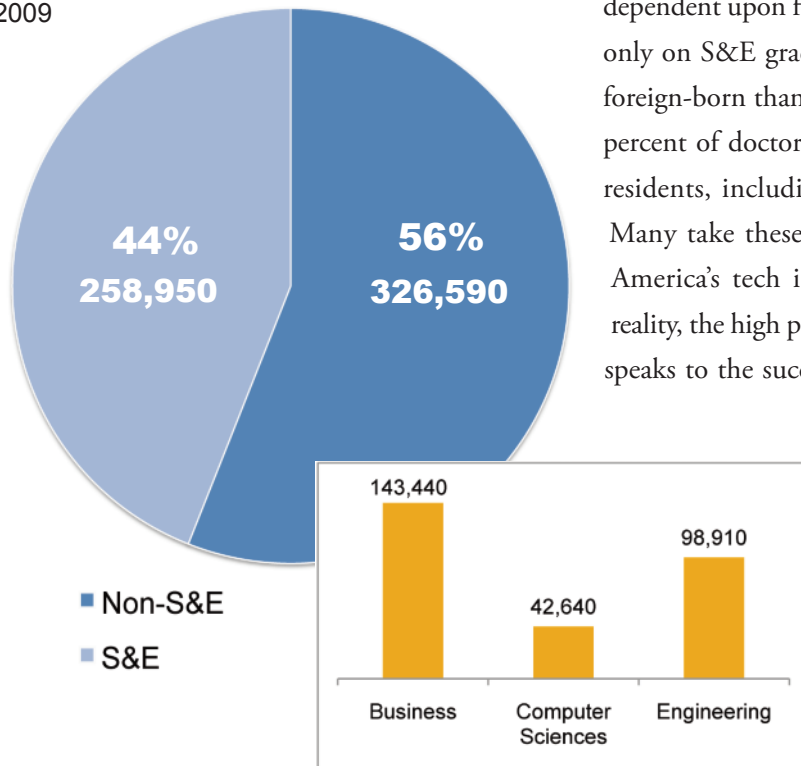
The numbers indicate that there is no labor shortage that creates a *need* for foreign-born scientists and engineers. Yet, foreign-born workers make up a disproportionate share of those working in STEM fields, and U.S. companies keep clamoring for more foreign guest workers. Why? As it turns out, the answer has little to do with Americans’ abilities in science and engineering or interest in STEM occupations. Instead, the trend is explained by guest worker programs and decreasing incentives for natives to enter these fields.

There is no shortage of interest in science and engineering among American students. Despite the well-documented foreign student influx, the percentage of U.S. high school graduates who go on to pursue S&E degrees in college has changed little over the past thirty-five years,¹⁹ and interest in science and engineering hit a 15-year high in 2008.²⁰ While it is true that between 2006 and 2009 the number of foreign students enrolled in S&E fields at U.S. universities rose by 11 percent, non-S&E foreign enrollment rose even more quickly, and non-S&E students represent 56 percent of all foreign students enrolled.²¹ Most tellingly, if guest workers are excluded, the foreign-born are no more likely to be scientists or engineers than natives.²²

There is no evidentiary basis for the argument that immigration is key to future competitiveness in STEM industries. Americans have shown the willingness and the ability to take S&E jobs and would constitute a larger share of the S&E workforce but for policies that allow U.S. companies to give preference to foreign workers.

Moreover, guest workers are admitted as non-immigrants whose residence in the United States is dependent upon the sponsorship of their employer. A small percentage of guest workers are sponsored by their employers for permanent residence, and less than 6 percent of immigrants to the United States are admitted for employment reasons.²³

Foreign Enrollment in S&E / Non-S&E Majors at U.S. Universities
2009



Those who argue that the future of the U.S. tech industry is dependent upon foreign workers often make their case by focusing only on S&E graduate students, who are even more likely to be foreign-born than their undergraduate counterparts. In 2009, 37 percent of doctorates awarded in these fields went to temporary residents, including 55 percent of doctorates in engineering.²⁴ Many take these numbers to mean that the future survival of America's tech industry is dependent on foreign workers. In reality, the high proportion of foreign-born graduate students only speaks to the success of the S&E industry in lobbying for guest worker programs and driving native students into other career fields.

There is limited incentive for native-born undergraduates in S&E to go on to graduate school in these fields. In recent years, S&E graduate students and postdoctoral fellows have endured longer times to degree completion, an increasing prevalence of

low-wage graduate and post-doctoral positions, and a decreasing availability of tenure-track positions at universities.²⁵ Overall earnings for advanced degree-earners in science have declined relative to those of the college-educated population over the past two decades.²⁶ While S&E bachelors holders typically out-earn other college graduates at all but the earliest levels of experience, earnings in S&E careers pale in comparison to those in other high-status careers, such as in business, medicine, and law.²⁷ Even if a student makes the decision to endure years of low-pay for a graduate degree in S&E, the long-term payoff may not prove worthwhile.²⁸

“...when you hear an employer saying he needs immigrants to fill a ‘labor shortage,’ remember what you are hearing: a cry for a labor subsidy to allow the employer to avoid the normal functioning of the labor market.”²⁹

As opposed to U.S. college graduates, many foreign S&E students seeking to come to the U.S. still see an advanced degree as an attractive career option compared to opportunities in their home countries. This is why immigrants make up such a high percentage of U.S. doctoral students and advanced degree earners in S&E. Research laboratories prefer to pay extremely low wages and continue to expand a growing post-doctorate population. This makes graduate study and post-doctorate work less attractive compared to natives' other options, but it is often still preferable for foreign-born students.³⁰ As more foreign students enter S&E programs, pay and opportunities decrease, making post-graduate study in these fields even less attractive for natives. Harvard economist George Borjas found that the immigrant-induced increase of graduate students has prolonged the period of postdoctoral work and lowered wages.³¹ However, foreign workers from developing countries still stand to increase their living standards, wages, and career prospects by coming to the United States. This combination of incentives for the foreign-born and disincentives for the native-born is the major cause of immigrants' disproportionate share of S&E graduate degree holders.

“The low graduate degree premium indicates that only weak financial incentives exist for domestic engineers to pursue graduate degrees. However the premium for students born abroad in a developing country is much higher since entrance into...the U.S. allows them access to much higher paying jobs in the U.S. upon graduation.”³²

WHY DO AMERICANS FORGO S&E GRADUATE STUDIES?

In 2005, the Committee on Science, Engineering, and Public Policy identified eight reasons why domestic students are becoming less interested in science and engineering graduate study.

1. Discouragement by faculty advisors.
2. Postdegree job uncertainty compared with business, law, and medical degrees.
3. More attractive employment opportunities available to S&E bachelor's degree holders.
4. Decreased availability of tenure-track positions at U.S. universities.
5. An average time of 7½ years to degree completion.
6. The expectation of postdoctoral training, further delaying entrance into job market.
7. Long wait times to first job or academic independence.
8. Low stipends during graduate and postdoctoral work compared with salaries available in other professions.³³

The easiest way to address the problems of job uncertainty, the decreased availability of university teaching positions, and low-paying postdoctoral positions would be to decrease the number of foreign-born graduate students, thus encouraging more native-born students to obtain advanced degrees in S&E.

Their career prospects undermined by an oversupply of foreign workers and graduate students, it is not surprising that many citizen S&E degree holders have chosen to forgo graduate school or to seek a career in other professions. Only 39 percent of college graduates with degrees in S&E were found to be working in fields related to their degree, while half were working in a non-S&E related occupation.³⁴ The correlation between a rising number of foreign workers and the number of S&E grads who seek other careers is evident. According to Hal Salzman, “the data show our high schools and colleges are providing an ample supply of graduates... [i]t is now up to science and technology firms to attract the best and the brightest graduates to come work for them.”³⁵ By instead lobbying for more and more guest workers, U.S. companies have chosen an alternate path.

Jobs Americans Can't Do?

The Talent Question

It has been suggested that the U.S. does not just have a shortage of scientists and engineers in general, but also a shortage of talented and creative scientists and engineers.³⁶ According to this line of thought, America is critically dependent on foreign scientists and engineers for much of its innovation, in large part because Americans are not up to the task. Two main arguments are used to support this claim: 1) that the U.S. education system is deficient and not producing an adequate supply of native-born talent and 2) that recent innovation and job growth has been due to the immigration and so more high-skilled foreign workers are needed to sustain America's innovative edge. However, the evidence that is used to show that U.S. students are falling behind international students is weak, and, though the foreign-born have made valuable contributions to U.S. innovation, their contributions are proportional to their population share. Moreover, the U.S. immigration system does not admit the most qualified foreigners, and skilled guest worker programs are not making up this deficiency by bringing in the “best and brightest.”³⁷

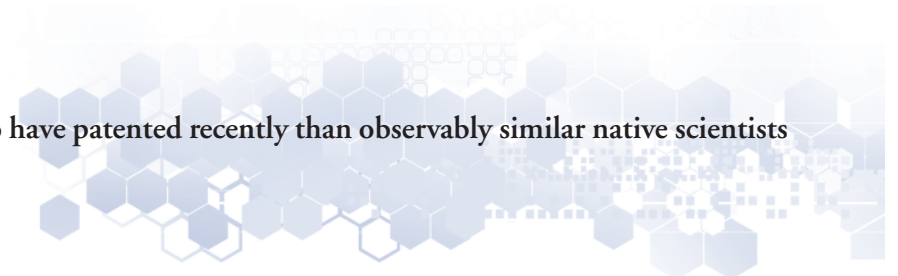
Some have contended that the large foreign-born STEM population in the U.S. is driving innovation in those fields. However, the research cited to prove this point demonstrates only that the foreign-born make up a large share of the STEM population, and that they innovate about as well as natives. A study by the National Bureau of Economic Research has often been cited to demonstrate that the U.S. depends on immigrants for innovation. This report included not just temporary residents, or guest workers, but all foreign-born with a college degree.³⁸ It found that immigrant contributions to S&E patenting (24% of patents) can be entirely explained by their high rate of participation in those fields:

We find that a college graduate immigrant contributes at least twice as much to patenting as his or her native counterpart. The difference is fully explained by the greater share of immigrants with science and engineering education, implying immigrants are not innately more able than natives. *Indeed, immigrants are less likely to have patented recently than observably similar native scientists and engineers.*³⁹

These findings certainly support the contention that the foreign-born have made important contributions to American innovation, but they also prove that immigrants are no more likely to innovate than natives. If

anything, they are *less* likely to innovate. The foreign-born do not have any intrinsic properties that drive U.S. innovation, and given the ample supply of S&E degree-holders that are working in other industries (recall that 65% of graduates leave S&E fields within two years), they could certainly be replaced by natives at no cost to America's competitiveness. Immigrant scientists and engineers are not the best and brightest — they are regular scientists and engineers, a commodity of which the United States has in abundance.

“Indeed, immigrants are less likely to have patented recently than observably similar native scientists and engineers.”



Also widely cited was a study by Vivek Wadhwa of Duke University which found that 25.3 percent of technology and engineering companies started between 1995 and 2005 had at least one foreign-born founder.⁴⁰ This figure is sometimes taken as evidence that the U.S. is critically dependent on foreign scientists and engineers.⁴¹ Given that companies with mixed-origin founding groups were counted in the “immigrant-founded” category, and even those individuals who were brought to the United States as an infant were included, one would expect the percentage of companies with at least one immigrant founder to be substantially higher. Another study, by William Kerr and William Lincoln, has been hailed as proof that foreign guest workers contribute significantly to innovation.⁴² Their study established a correlation between the concentration of H-1B visa holders in a location and the number of patents originating in that area. The authors caution that their finding should not be taken as causal evidence of foreign workers spurring U.S. innovation and that none of their estimates were statistically significant. Notably, their study does not account for the possibility that “immigrant and native SEs are simultaneously attracted to cities and states with rapidly expanding technology opportunities and SE labor demand.”⁴³ Obviously, the presence of firms that are simultaneously patenting and hiring guest workers accounts for the presence of foreign workers in areas where patenting occurs.

It is important to understand the effect of immigration on innovation. Foreign-born scientists and engineers innovate, but the most commonly cited research about the connection between the two shows that the foreign-born do not contribute any more to innovation than their native-born peers. Unfortunately, these studies have been cited to suggest things that are contrary to their conclusions and far beyond their scope. In reality, they prove little more than that the foreign-born make an appropriate-sized contribution for a group that makes up nearly 25 percent of the S&E labor force. If these workers were replaced with natives, the evidence demonstrates that innovation and competitiveness would remain the same, if not increase.

Some might argue that the large share of foreign S&E graduate students proves that they are making a greater “pound-for-pound” contribution than natives. It is important to note that any such argument does not hold up

under examination. The proportion of S&E degree holders who reported engaging primarily in R&D work is over four times higher for those with bachelor's degrees than it is for those with PhDs (53% to 12%).⁴⁴ Forty-one percent of scientists and engineers named on patent applications between 1998 and 2003 were bachelor degree holders, compared to 31 percent with master's degrees, and 24 percent with a doctorate.⁴⁵ S&E PhD holders, whether native or foreign-born, are not driving innovation in the private sector, where only 28 percent of doctorate holders are found; 42 percent of S&E PhDs are employed by academic institutions.⁴⁶

More importantly, the argument that immigration drives innovation in STEM fields is thoroughly misleading. Once employed, foreign-born scientists and engineers, often non-immigrants, are actually *less* likely to innovate than similar native-born workers.⁴⁷ American students would be happy to take a greater share of our S&E jobs, but policies that flood the labor market and give preference to foreign workers are discouraging and even preventing natives from entering S&E fields.

International Tests

In recent years, much has been made of the results of two international student assessments, the PISA and TIMSS tests. PISA, the Program for International Student Assessment, measures 15-year-olds in reading, math, and science literacy, as well as “general or cross-curricular competencies such as learning strategies.”⁴⁸ TIMSS, the Trends in International Mathematics and Science Study, measures math and science attainment of fourth and eighth graders.⁴⁹ It is unclear why the U.S. would assess top students' potential based on the national average score on a multiple choice test, but many have become alarmed that the average American student is merely competitive with his international peers. On the basis of the U.S. ranking relative to other countries on these assessments, some have concluded that our education system is inadequate, and that the United States must compensate by admitting more foreign-born scientists and engineers.

It is one thing to say that the U.S. education system could be improved, and another entirely to say that the results of international tests show that U.S. students as a whole are incapable of performing in science and engineering. The average score of millions of students says very little about students at the top or bottom, and one country's high average says little about another country's ability to sufficiently supply scientists and engineers. Given that scientists and engineers are only 5 million of the over 150 million workers in the country, it makes absolutely no sense to use the average U.S. student's achievement to gauge the health of a profession reserved for high achievers. Clearly, if every student in the U.S. aced the test it would reflect positively on the country and its education system. However, the TIMSS and PISA tests do not provide a reliable basis for international comparisons and reflect more positively on the U.S. education system than is generally noted.⁵⁰ The tests show that students in other countries are capable of performing at comparable levels to U.S. students, and vice versa. They certainly do not demonstrate that the U.S. faces a talent shortage in science and engineering.

Results on these international tests should not be used as a basis for international comparison for a number of reasons. A robust body of research has demonstrated that international comparisons are invalid due to poor

sampling, methodological uncertainty, cultural bias, and an inability to measure the true quality of education systems.⁵¹ First, the practice of determining which students are included or excluded depends on the subjective judgment of test administrators and additional regulations set by participating countries and varies widely.⁵² Other evidence of systematic underrepresentation of certain populations exists as well. The Brookings Institution has criticized the PISA test for including questions whose answers are based on politically-charged issues — for example, students can be penalized if they do not favor protection for endangered species or support cap-and-trade policies.⁵³

One test reviewer concluded that even “[i]f only a few of the methodological issues raised are on target,” international comparisons based on the data “should be abandoned right away.”⁵⁴ International tests serve as a valuable reminder that our education system is not optional, but small differences in average scores are simply not enough to determine that the U.S. is incapable of producing sufficient numbers of qualified scientists and engineers — especially considering the fact that future scientists and engineers tend to be above-average scholastically.⁵⁵ Overall, the U.S. has been “one of a very few nations that consistently rank above the international average in tests of academic performance.”⁵⁶ In any case, the results of these tests should not be used as the basis for immigration policy.

“Skilled” Guest Worker Programs

The U.S. has a large pool of science and engineering graduates who face declining wages and poor career prospects. Despite tech firms’ claims to the contrary, labor market data clearly indicate that no shortage of S&E manpower exists. It is not that there are too few native-born who can work in STEM fields. From 2003 to 2007, 71 percent of new workers in STEM professions were native-born and 77 percent of total STEM workers in 2007 were native-born, despite tens of thousands of new workers coming in every year as guest workers.⁵⁷ However, as the number of foreign STEM workers increases, more Americans will *choose* not to enter STEM fields, and the proportion of foreign-born employed in these occupations is likely to increase — but not due to a lack of available native workers.

Supporters of expanded S&E guest worker programs also claim that immigrants are needed to drive innovation. Alongside the idea that there are not enough American scientists and engineers, industry lobbyists promote the myth that temporary visa programs assure prosperity by attracting the “best and brightest.” In reality, tech firms use guest workers to cut wages and facilitate job outsourcing, not to attract brilliant innovators who wish to become citizens.

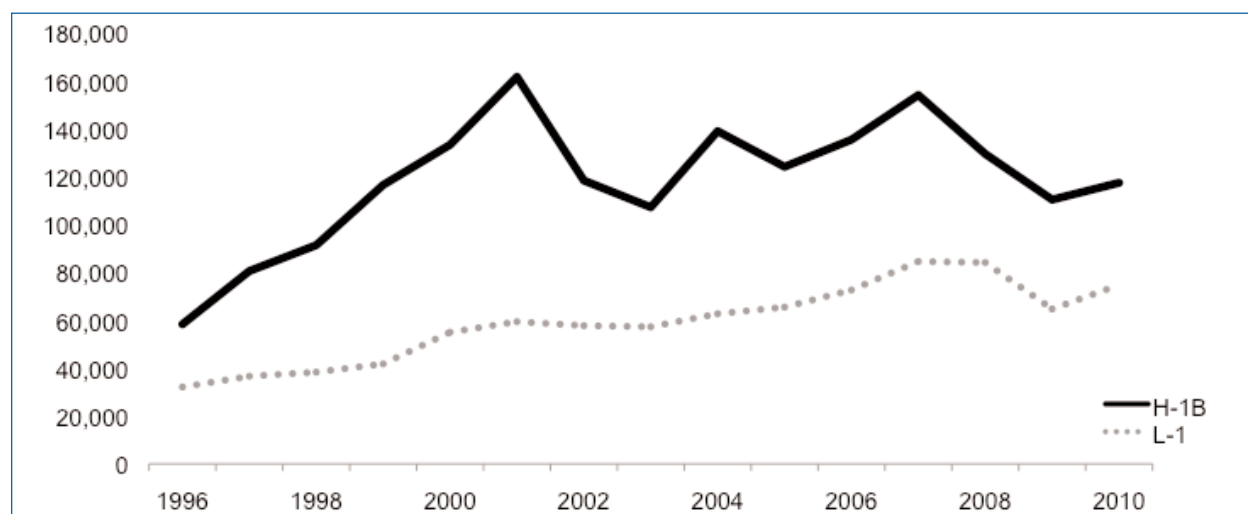
L1 and H-1B Visas

The H-1B visa for “persons in specialty occupations” is the most widely used method of bringing in skilled workers, or as the industry claims, the “best and brightest.” Created in 1990, the H-1B visa has steadily grown into a federally sanctioned program widely used by U.S. employers to circumvent the domestic labor market

and to displace or disqualify capable American workers. H-1B workers are much like indentured servants in that their contract binds them to the employer, making it very difficult for them to leave the job once hired. The official requirement for bringing in an H-1B worker is as follows:

“The regulations define a “specialty occupation” as requiring theoretical and practical application of a body of specialized knowledge in a field of human endeavor including, but not limited to, architecture, engineering, mathematics, physical sciences, social sciences, medicine and health, education, law, accounting, business specialties, theology, and the arts, and requiring the attainment of a bachelor’s degree or its equivalent as a minimum.”⁵⁸

L-1 and H-1B Visas Issued 1996–2010



An H-1B visa is valid for three years and can be renewed for another three years. If a company is sponsoring an H-1B visa holder for a green card, the visa can be renewed indefinitely. The annual cap for H-1B visas is currently set at 65,000 with an *additional* 20,000 H-1B visas set aside for foreign-born graduates with at least a master’s degree from a U.S. university.⁵⁹ H-1B visas renewed for an additional three years are not counted against the cap. Also, H-1B visas issued to those working at institutions of higher learning or non-profit and government research organizations are exempt from the cap.⁶⁰ The 65,000 “cap” is only nominal and does not reflect the actual number of H-1B workers admitted annually, or the total number in the country at any one time.

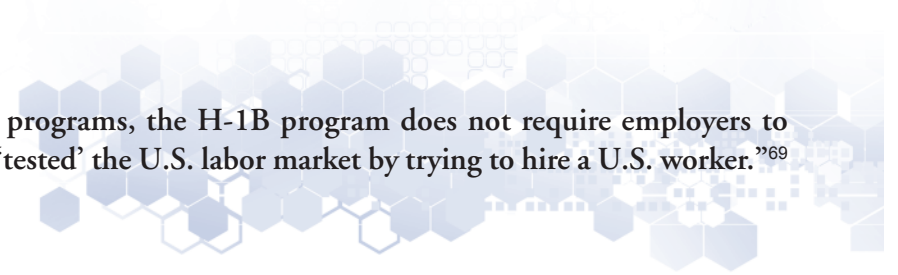
“An increase in the supply of immigrant S&E workers will, all else the same, reduce earnings and employment opportunities below what they otherwise would have been, lowering the incentives for persons...to enter the S&E job market.”⁶¹

The H-1B sponsoring employer must attest that it will pay the guest worker at the same rate as similar employees and that an H-1B worker will not displace or adversely affect a U.S. worker, but the employer does not have to “test” the market, i.e., actually attempt to locate a qualified American worker. Only “H-1B Dependent” employers, those whose U.S. workforce is comprised of at least 15 percent of H-1B workers, must also attest that they attempted to recruit a U.S. worker, and that a U.S. worker will not be displaced 90 days before or after filing a petition for an H-1B employee.⁶² However, an employer does not have to provide any documentation that its attestations are true, alleviating the federal government from having to enforce these provisions. Accordingly, an astounding 94 percent of H-1B petitions were approved between 2000 and 2009.⁶³

With an almost total lack of government scrutiny, the safeguards are ineffectual. Employers can and do use the H-1B program to replace American workers and the wage and labor attestations are usually accepted without question by government administrators. The Government Accountability Office (GAO) found that the Department of Labor’s Wage and Hour Division has never initiated an investigation into H-1B wage violations to make sure that employers are abiding by the conditions of the program, even though there are clear indications that companies are using the H-1B program to drive down wages.⁶⁴ Unsurprisingly, this lack of oversight has led to rampant fraud — in 2008, USCIS found that 21 percent of H-1B petitions contained a violation.⁶⁵ While H-1B workers exhibit an unwillingness to lodge a complaint about their pay levels due to a fear of reprisal, the Department of Labor has the full authority to ensure that American workers are not being put at a disadvantage through the importation of guest workers — a responsibility it has thoroughly abandoned.⁶⁶

Even when employers adhere to the rules, the H-1B program is set up to allow employers to use it to legally undercut the position of native workers in STEM fields. As Norman Matloff, one of the leading experts on H-1B visas, explains, “the ‘prevailing wage’ requirement of H-1B law and regulations is defined so loosely that numerous loopholes are available to employers for keeping H-1B wages low while being in full compliance with the law.”⁶⁷ Employers, who are required to classify their job offering from Level I-IV depending on experience level, can easily classify jobs at a lower level than is appropriate. The vagueness of job titles allows employers to save money simply by giving the job a slightly different name, and employers can also choose between many different wage surveys.⁶⁸ Not only can employers easily offer below-market wages without running afoul of the Department of Labor, they do not even have to make an effort to attract and hire a U.S. worker.

“Unlike some other temporary visa programs, the H-1B program does not require employers to provide evidence that they have first ‘tested’ the U.S. labor market by trying to hire a U.S. worker.”⁶⁹



Over half of the employers who requested H-1B workers between June 2009 and July 2010 stated that these workers would be receiving entry-level wages, the lowest allowable level.⁷⁰ Inevitably, allowing hundreds of thousands of foreign workers who will take entry level wages into the labor market lowers the prevailing wage paid to workers in STEM occupations, especially given that the Department of Labor does not verify that these employees are actually doing entry-level work. The GAO found that some employers acknowledged that “H-1B workers were often prepared to work for less money than U.S. workers,” which influenced the employers’ decision to hire foreign guest workers.⁷¹ Phiroz Vandrevalla, an executive with Tata Consultancy Services, the largest of the so-called body shops supplying H-1B workers to U.S. companies, puts it thusly:

Our wage per employee is 20-25 percent less than U.S. wage for similar employee... It’s a fact that Indian IT companies have an advantage here and there’s nothing wrong in that...The issue is that of getting workers in the U.S. on wages far lower than the local wage rate.⁷²

Ron Hira’s analysis of data from the Bureau of Labor Statistics revealed that Vandrevalla’s statement was true for H-1B computing professionals. Hira found that these workers earned 25 percent less than their U.S. counterparts.⁷³ Overall, real wages for H-1B workers *decreased* by 1.3 percent between 2001 and 2008, and by as much as 6 percent for computer programmers and systems analysts.⁷⁴

GROWTH OF L-1 VISA PROGRAM The L-1 “Intracompany Transferee” visa allows a company to bring an employee who has worked for that company abroad for one year to the United States. The L-1 visa is divided into two categories, L-1A for employees serving in an executive or managerial position, and L-1B for employees with “specialized knowledge,” though the specialization of the knowledge is determined wholly by the employer. An L-1A visa is valid for seven years and the L-1B for five years. There is no labor market test or wage requirement for employers who sponsor an L-1 guest worker. In fact, for L-1 workers the terms of admission are so broad that the Office of the Inspector General (OIG) found that government officials who review these visa applications “believe they have little choice but to approve almost all petitions.”⁷⁵

“If a genuine labor shortage existed, wages in these fields would have risen dramatically in ways they have not. In addition, unemployment rates in this sector have increased dramatically over the past year, with engineers reaching their highest unemployment rate since 1972. Graduation rates in the STEM fields also indicate that the United States is producing enough graduates to meet the employment needs of the industry.”⁷⁶

The L-1 program was not specifically implemented to bring in STEM workers but it has steadily increased its supply of guest workers in STEM professions. From 1999 to 2004, nine of the top ten companies petitioning for L-1 visas were computer and IT outsourcing firms, with 48 percent of petitions naming beneficiaries from India.⁷⁷ The evidence points to employers increasingly using the L-1 program to circumvent the cap of H-1B workers. From 2000 to 2008, while the numbers of H-1B visas approved decreased slightly, L-1 visas approved

rose by 53 percent.⁷⁸ A 2011 government report found that 12 out of the 14 multinational firms it surveyed admitted that they had found a way to bring in a worker who had been denied an H-1B visa. One of the main ways to do this was to bring in a worker denied an H-1B visa into the U.S. on an L-1 visa instead.⁷⁹

L-1 visas are an attractive alternative for STEM employers because the L-1 has no requirement that beneficiaries be paid a prevailing wage, nor that American workers not be displaced by a foreign worker. And, unlike the H-1B visa, the spouses of L-1 workers are given L-2 visas, authorizing the spouse to work in the United States. This is why the OIG reported that “there is some concern that the L-1B visa for workers with specialized knowledge, which has no such numerical limit, might serve as a way to avoid the H-1B cap for some employers.”⁸⁰

Abuse of the System

Bringing in hundreds of thousands of foreign workers to fill jobs in high-skilled occupations would make sense only if there were a critical shortage of native workers, and not the oversupply that currently exists. Companies are using guest worker visa programs not to supplement American workers but to *supplant* them. Not only is there an overabundance of qualified STEM workers already in the country, the high tech industry is also importing workers at a much higher rate than it is creating new jobs. In 2009, when 245,600 jobs in the high tech industry were *lost*, 214,271 H-1B petitions were approved, 84 percent of those submitted.⁸¹ Microsoft in 2009 laid off 5,800 workers while bringing in 2,355 H-1Bs.⁸² IBM, a top ten recipient of both H-1B and L-1 workers, laid off over 28,000 workers in the U.S. between 2005 and 2009.⁸³

The government has turned a blind eye to the abuse of guest worker programs. No federal agency can even give a figure for how many guest workers are in the country at any one time, and there is not a system in place to keep track of guest workers in the United States.

Approved H-1B Petitions — by Occupational Group⁸⁴
2008

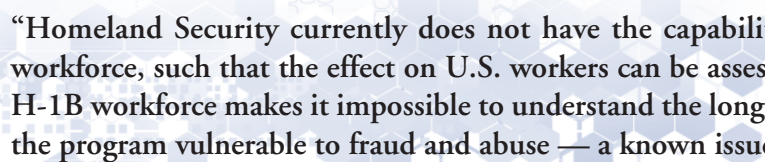
Occupation	Total	Percent of Total
Computer related	137,010	49.6%
Engineering, Architecture, Surveying	30,062	10.9%
Medicine and Health	17,778	6.4%
Miscellaneous Professional, Technical and Managerial	5,114	1.9%
Life and Social Sciences	11,904	4.3%
Mathematics and Physical Sciences	5,933	2.1%
Education	28,880	10.5%
Other	39,571	14.3%
Total	276,252	100%

According to the GAO:

The total number of H-1B workers in the U.S. at any one time — and information about the length of their stay — is unknown, because (1) data systems among the various agencies that process such individuals are not linked so individuals cannot be readily tracked, and (2) H-1B workers are not assigned a unique identifier that would allow for tracking them over time — particularly if and when their visa status changes.⁸⁵

The best estimates, based on new visa admissions and renewals, puts the numbers of H-1B workers in the U.S. in 2009 at between 600,000 and 650,000 and the number of L-1 visa holders at 350,000.⁸⁶ That puts a million foreign guest workers in the United States, largely in STEM industries, while the federal government has not demonstrated the capacity to identify the need for such workers, or to ensure employer compliance with the provisions of these guest worker programs. And the tech industry is calling for a major expansion of guest worker programs.

The lack of oversight is an open invitation to fraud, a fact that has been acknowledged by the federal government. According to the GAO, “lack of information on the total H-1B workforce makes it impossible to understand the long-term impact of the program and leaves the program vulnerable to fraud and abuse — a known issue in this program.”⁸⁷ The GAO found that 21 percent of H-1B petitions were either fraudulent or contained violations.⁸⁸ Among the violations were H-1B workers not receiving the prevailing wage (27% of total violations), fraudulent or forged documents (20%), non-existent or “shell” businesses (14%), and beneficiaries performing



“Homeland Security currently does not have the capability to determine the cumulative H-1B workforce, such that the effect on U.S. workers can be assessed. ...Lack of information on the total H-1B workforce makes it impossible to understand the long-term impact of the program and leaves the program vulnerable to fraud and abuse — a known issue in this program.”⁹⁰

job duties not consistent with job description on petition (12%).⁸⁹

Much of the problem is due to the role of “body shops” in the guest worker process. Body shop refers to an outsourcing firm, usually with its main operation out of India, that applies for guest worker visas and then contracts these workers out to some of the largest U.S. companies, such as Qualcomm, JPMorgan Chase, IBM, Deloitte Consulting, and KPMG.⁹¹ The benefit for the employer is that someone else does the work of locating workers and getting their visa applications approved and the employer can always blame the body shop when violations occur.

In 2008, eight of the top ten employers of both H-1B and L-1 visa holders were body shops.⁹² These body shops operate to provide STEM employers in the United States with low-cost foreign workers with the full

sanction of the federal government. Even worse, there are numerous accounts of major U.S. firms, including Pfizer, Nielsen, Wachovia, Bank of America, and Siemens using U.S. workers to train their foreign replacements, a practice so widespread that it is commonly referred to as “knowledge transfer.”⁹³ After a visa worker is trained in the U.S., a company may then transfer that worker back overseas where costs are even cheaper.

“The involvement of staffing companies...further weakens enforcement efforts because the end-user of the H-1B worker is not liable for complying with labor protection requirements.”⁹⁴

The conditions for the foreign workers are also exploitative, as body shops often charge exorbitant placement fees or house many guest workers together and charge high rent. Other times the promised job is non-existent and “skilled workers” are forced to do janitorial work or pump gas.⁹⁵ Because visa holders have to go back to their home country if they lose their job, they are reluctant to report abuses. Several body shop operations have been fined and/or barred from participating in the H-1B program. Two of the most egregious offenders have been Cygate Software and Consulting (now Sterling System), which confiscated its employees’ visas and extorted

EDUCATION, JOBS AND H-1BS

The 85,000 cap does not apply to workers who are brought in on H-1B visas to work at non-profits or institutions of higher learning. The increase in educational institutions bringing in foreign H-1Bs in addition to foreign students, is further limiting opportunities for natives while providing universities with low-wage workers. In 2008, according to the USCIS, there were almost 29,000 H-1B workers in educational institutions, all exempt from the cap.⁹⁶ Major research universities bring in large numbers of H-1B visas, so much so that in 2006, 57 percent of post-doctoral fellows in the United States were on temporary visas.⁹⁷

Public school systems also bring in H-1B workers to take teaching jobs. While not exempt from the cap restrictions, schools that bring in primary and secondary teachers on H-1B visas are exempt from some of the normal fees.⁹⁸ In fact, the Prince George’s County and Baltimore City School systems, both in Maryland, rank respectively as the 18th and 19th largest employers of H-1Bs in the United States. There have been such severe abuses of the program found in Prince George’s County that the Department of Labor declared the county a “willful violator” and ordered it to pay \$5.9 million in fines and back wages, and is threatening to bar the county from participating in the program.⁹⁹

For a more in-depth look at the use of H-1B teachers in public schools, see David North, “H-1B + K-12 = ?,” Center for Immigration Studies, April 2011 (www.cis.org)

OPTIONAL PRACTICAL TRAINING YET ANOTHER “SKILLED” GUEST WORKER PROGRAM

“Optional Practical Training” (OPT) originated as a way to allow F-1 students to work in United States for up to 12 months after graduation, with the expectation that many of these graduates would be applying for an H-1B visa.¹⁰⁰ In 2008, the Bush administration extended the employment period by 17 months for a total of 29 months of work eligibility for F-1 graduates in approved fields.¹⁰¹ At that time, the government estimated that 22,000 foreign students would benefit from the extension. Senator Charles Grassley revealed in Senate hearings that in 2010, 95,259 graduates took advantage of the OPT extension.¹⁰² In May 2011, President Obama vastly expanded those who can qualify for OPT to include over 300 STEM-related majors such as Animal Breeding, Social Psychology, and Data Processing.¹⁰³ Tens of thousands of more F-1 visa holders can now qualify to work in the U.S. for almost two and a half years while applying for H-1B visas that can extend their stay for another six years.

The OPT designation creates a special guest worker program that allows foreign students to compete for the meager jobs available to new college graduates, and it incentivizes employers to hire these foreign students over native graduates. As David North from the Center for Immigration Studies has pointed out, OPT employees are exempt from Social Security and Medicare taxes so employers benefit from hiring these workers.¹⁰⁴ North has calculated this to be worth a 7.65 percent discount to employers for hiring an OPT over a native worker if they were paid the same wage. When America college graduates are facing a bleak job market, the Obama administration is making it even more difficult for them to find employment, and touting this as yet another “stimulus” move.

high fees from it workers, and Peri Software, which was debarred by the Department of Labor from participating in the H-1B program for underpaying its employees by \$1.5 million.¹⁰⁵ Infosys, one of the world’s largest body shops, has recently come under intense scrutiny. The House subcommittee on immigration heard from an Infosys employee who testified that the company, whose clients include Wal-Mart, Goldman Sachs, and American Express, had engaged in systematic fraud by bringing in workers on B1 visas (business visitor) in order to circumvent the H-1B restrictions.¹⁰⁶

If, as employers claim, foreign workers are key to the future of STEM industries, it would follow that employers would sponsor these employees as permanent residents. If there is a lack of qualified native employees available, and if there are too many hurdles to bringing in foreign workers, again as STEM employers claim, then it would follow that the employer would not want to lose skilled employees who have been extensively trained. Ron Hira has found in his research that the top 20 employers of H-1B applied for green cards on behalf of only 13 percent of their H-1B workers.¹⁰⁷ As the Department for

Professional Employees, AFL-CIO points out, the failure of firms to sponsor guest workers for green cards, “illustrates a lack of commitment to and investment in their guest worker workforce. Instead, the H-1B and L-1 labor pool is used to decrease employer labor costs with little to no concern for the impact on workers.”¹⁰⁸

With all of the evidence clearly demonstrating that the existing skilled worker programs do not protect American workers and are not geared to select only the “best and brightest” foreigners, the solution to this problem would be to reform the program to protect American workers, not to lower the visa requirements to facilitate the inflow of guest workers. But in August 2011, the Department of Homeland Security (DHS) in August 2011 issued a “clarification” that would do just that. DHS Secretary Janet Napolitano and Alejandro Mayorkas, the director of Citizenship and Immigration Services (USCIS), issued an announcement that a guest worker on an EB-2 visa (advanced degree, exceptional ability) no longer needs a job offer and a certification from the DOL that American workers will not be adversely affected if waiving these requirements is in the “national interest.”¹⁰⁹

The USCIS also will allow an alien to obtain an H-1B visa without employer sponsorship if the alien is found to be an “entrepreneur.” This implies that an H-1B holder, previously dependent upon a third party employer, can remain in the United States on a self-sponsored visa, can contract out to work independently (giving employers greater flexibility in the hiring of H-1Bs), and can sponsor other H-1B visa holders. In effect, these new regulations could, at least in theory, result in the establishment of new H-1B body shops in the United States. By establishing these new precedents, which, at best, are an end run of Congressional intent, USCIS has created a scheme that is liable to perpetuate abuse of the guest worker system.

The Real “Best and Brightest”

“Political rhetoric aside, there’s no lack of workers to fill technical jobs. And the pipeline of U.S. math and science students to fill future positions has not deteriorated in terms of international competitiveness in the past 15 years.”¹¹⁰

The foreign-born make up a large share of the STEM population primarily because the guest worker system admits them, and they compose an especially large share of the graduate-degree population because natives have extremely low incentive to complete those degrees. Though some claim that there is a shortage of native scientists and engineers, there is, in fact, a large number of natives earning S&E degrees each year. The U.S. has far more S&E graduates than S&E jobs. The U.S. education system is in need of reform, but no evidence exists to suggest

that it is incapable of producing qualified graduates. Even according to the studies cited by advocates of increased skilled guest worker programs, the foreign-born do not provide any extra boost in innovation — instead, foreign-born and natives innovate proportionally to their share of the labor market.

Clearly, foreign-born workers in science and engineering neither fill a void in the labor market nor provide a special contribution to innovation. However, the large influx of foreign-born into STEM industries has had major implications for the best and brightest American students. Decades of warnings about STEM labor shortages have succeeded in creating a huge supply of domestically-produced scientists and engineers supplemented by a massive pipeline of immigrants into the same fields. As discussed earlier, this oversupply has decreased the attractiveness of STEM careers, and especially graduate studies in S&E fields. As career prospects for scientists and engineers have declined, the best and brightest American students are finding other careers more attractive when they choose their place in the labor market. Interest in S&E remains high, but the U.S. risks undermining its long-term supply of qualified scientists and engineers if it continues to allow the industry to drive down job prospects through the use of foreign labor.

The declining incentives to pursue science and engineering have begun to hit another group of natives particularly hard: the truly best and brightest. Today, science and engineering jobs are significantly less attractive than other high-status careers like doctors, lawyers, business managers, and financial consultants.¹¹¹ The declining incentives for natives to pursue careers in science and engineering have not diminished interest in the career among college freshmen overall, but poor career prospects are driving the best students into other career fields.¹¹²

Using the top 20 percent of SAT math scores as a proxy for S&E aptitude, it becomes clear that diminishing career prospects in science and engineering are beginning to drive the highest-achieving American students out of the field. Of those who graduated high school in 1972, 21 percent of the top math students later took a job in S&E; among 1982 graduates, the figure rose to 24 percent; and among 1992 graduates, 29 percent of the top math performers in the U.S. eventually took an S&E job. However, despite the continuing increase in S&E jobs available, just 13.8 percent of the 2000 high school class's top graduates have entered science and engineering — meaning that the percentage of top domestic students entering S&E has declined by over half.¹¹³ Despite the U.S. student population's continuing interest in S&E, top students are responding to the reduced incentives to enter S&E by choosing other fields.

Just as common sense would dictate, strong evidence exists that these top American students are responding to increased job competition, including that from the influx of foreign workers. A survey of Harvard biological science majors found that over 50 percent did not plan to enter the field due to low salaries and insecure career prospects.¹¹⁴ A study by university economists found that both citizens and non-citizens holding doctorates in S&E have faced low employment opportunities, and that American-born S&E students have either been dissuaded from pursuing doctoral studies by the influx of foreigners or lured by better employment opportunities elsewhere.¹¹⁵ Giovanni Peri and Chad Sparber found that natives tend to move to jobs with more communicative

content (law or business) in response to an influx of immigrants with quantitative skills.¹¹⁶ In a perverse twist, the practice of flooding the labor market in response to perceived talent shortages has now damaged career prospects to the point that the brightest and most capable American students are less likely to enter STEM fields.

“The paradox of the proposed policies to increase science and engineering graduates is that short-term supply expansion is likely to lead to longer-term weakness in U.S. science and engineering capacity.”¹¹⁷

When the U.S. government allows employers to bring in so much foreign labor, including lower-wage, exploitable guest workers, it is complicit in the resulting abuses. However, a consequence of our current policy is that other jobs have become more attractive to the best and brightest American students. The foreign-born are not any more likely to innovate than their native counterparts, but if we continue to discourage the highest-achieving domestic students from pursuing careers in STEM fields, we may truly lose our competitive edge in the long run. Immigration policy should respond to true labor market needs, not employers clamoring to flood the market and drive down wages with foreign labor. If the U.S. government continues to help employers drive up the supply of scientists and engineers, we risk taking away all incentives for the best and brightest Americans to pursue these careers. Rather than bringing in unnecessary foreign workers the U.S. should prioritize its long-term competitiveness by promoting policies that encourage its best and brightest to enter STEM fields, not policies that drive down wages in the name of short-term profits for private companies.

Conclusion

“It is not a shortage of scientists and engineers but of U.S. entrants into the field. But many of the persons and firms who make these arguments do not face up to the potential trade-off issue: that to attract more U.S. citizens, earnings and employment opportunities have to get better, which is difficult to effectuate as long as the country can attract many scientists and engineers from overseas at current wages and employment opportunities.”¹¹⁸

Immigrants make up a large share of the science and engineering population because the immigration system allows U.S. companies to bring in tens of thousands of guest workers every year. They also compose an especially large share of the graduate-degree population because natives have such low incentive to pursue those degrees. Though some claim that there is a shortage of native scientists and engineers, the number of natives earning S&E degrees has remained consistent, and there are far more S&E graduates than S&E jobs. U.S. students are

just as interested in science and engineering as they were 30 years ago. There is no evidence to suggest that the U.S. is incapable of producing its own S&E workforce for many decades into the future.

While these percentages show an overrepresentation of foreign-born scientists and engineers working in STEM fields, they certainly do not suggest a shortage of native talent. Instead, these percentages are reflective of an immigration system that encourages foreigners to enter the U.S. and gives employers strong reasons to prefer them over natives. With up to 12 million more S&E graduates than job openings in these fields, it is simply untrue that there is a shortage of available candidates already in the United States, yet almost 675,000 H-1 and L-1 workers were approved in 2009.

Tech firms promote the myth of manpower and skill shortages in S&E because it results in public policies that help them cut wages and exploit workers. Flooding the market with skilled immigrants may help employers in the short term, but driving down wages harms American workers and discourages the best and brightest American students from pursuing S&E careers. In order to wean U.S. tech employers off their dependence on cheap foreign labor, guest worker programs must be reformed so that only those who truly possess exceptional skills that are in short supply domestically are admitted for employment. There must also be a genuine labor market test, instead of a simple attestation by employers that no qualified American worker can be found. The Department of Labor must take seriously its duty to promote and protect the interest of American workers rather than remaining complicit in their exploitation.

Recommendations

AMERICAN WORKERS COME FIRST

- No guest workers should be admitted when similarly skilled Americans are available.

GUEST WORKER PROGRAMS SHOULD BE RESPONSIVE TO MARKET CONDITIONS AND TRULY TEMPORARY

- Guest worker programs should be tied to the needs of the U.S. economy, not determined by U.S. employers' desire for cheaper foreign workers. Wages in the STEM field are rising slower than inflation indicating no shortage of available workers.
- Congress should require an accurate count of all guest workers in the United States, especially including individual entry and departure information. As it stands now, the federal government is unable to determine how many guest workers are actually in the United States, or how many have overstayed their visas.

INSTITUTE A TRUE MARKET TEST FOR ALL H-1B EMPLOYERS

- Congress should require that any employer who is applying to bring in an H-1B employee provide documentation that the employer has attempted to recruit an American worker.

CHANGE TERMS OF H-1B VISA

- The H-1B visa should be valid for a non-renewable period of three years. If an employer wants to sponsor the employee for a green card, the position must be advertised first to available similarly qualified American workers, and only if none are available may the H-1B worker apply for and receive annual extensions until such time as a green card is available.
- H-1B Dependent employers should pay a fee of 5% of every H-1B employee's salary to the Department of Labor (DOL) to be used for job-training programs for American citizen workers.

REQUIRE MEDIAN WAGE RATE FOR H-1B WORKERS

- The DOL should replace the current wage requirements that allow employers to underpay H-1B workers with the requirement that an H-1B employee be paid the median wage for the job according to existing industry standards.

DEPARTMENT OF LABOR MUST PROTECT AMERICAN WORKERS

- The DOL exists to protect the interest of American workers, not to facilitate their displacement. The DOL should investigate claims of skilled worker shortages and issue a report to Congress on the matter. The DOL will find, as all researchers have found, that there is no shortage of Americans to fill available STEM jobs.

- The DOL must systematically monitor wages paid to H-1B employers to ensure that they are in-line with prevailing wage rates and in accord with the employer's job descriptions.
- Congress should mandate that temporary foreign workers must be laid off before similarly skilled American workers and task the DOL with enforcing this provision.

SPECIFY THE QUALIFICATIONS FOR THE L VISA PROGRAM

- The DOL should outline specific guidelines for what constitutes "specialized knowledge" and median wage requirements should be established comparable to the H-1B visa.

OPTIONAL PRACTICAL TRAINING

- OPT should be scaled back to its original period of 12 months and its original narrow set of approved STEM majors. F-1 visa holders in the country under OPT may apply for an H-1B visa under conditions described above.

Appendix: Calculation of S&E Labor Force Excluding H-1B Guest Workers

STEP 1. ESTIMATED PERCENT OF H-1B VISAS HELD BY SCIENTISTS AND ENGINEERS

Because DHS and USCIS do not keep a record of H-1B visas holders in the country, we used USCIS's data on the petitions approved each year from 2004-2009 to estimate the percent of H-1B visas that are held by scientists and engineers. The six-year window was chosen because that is the maximum length of an H-1B visa holder's stay. Government records make it impossible to be exact, but this estimate is a fair representation.

Table 1: H-1B Occupations by Year¹¹⁹
2004 – 2009

	% OF S & E	% EXCL. SOCIAL SCIENCES	NUMBER OF S & E	TOTAL PETITIONS APPROVED*	OCCUPATION CATEGORIES INCLUDED IN S&E TOTAL					
					COMPUTER-RELATED	ARCHITECTURE ENGINEERING SURVEYING	LIFE SCIENCES	MATH/ PHYSICS	SOCIAL SCIENCES	MUSEUM LIBRARY ARCHITECTURE
2009	61.3%	59.1%	131,019	213,681	88,961	25,278	6,456	5,645	4,461	218
2008	67.1%	65.2%	185,253	276,080	137,010	30,062	6,990	5,933	4,914	344
2007	67.8%	65.7%	190,303	280,497	139,628	31,866	6,946	5,879	5,698	286
2006	66.8%	64.5%	180,267	269,898	130,556	29,883	7,731	5,949	5,862	286
2005	63.3%	60.9%	167,785	264,892	113,867	32,030	8,840	6,600	6,072	376
2004	65.5%	63.1%	187,214	285,778	129,279	34,595	9,290	7,129	6,557	364
Total	65.5%	63.3%	1,041,841	1,590,826	739,301	183,714	46,253	37,135	33,564	1,874

* excludes "occupation unknown"

STEP 2. PERCENT AND NUMBER OF H-1B VISAS HELD BY SCIENTISTS AND ENGINEERS

The estimate for the percent of H-1B visas held by scientists and engineers is multiplied by the best available estimate of the total H-1B population.

Table 2: Estimate of H-1B S&E Population

H-1B ESTIMATES ¹²⁰	FY 2004–09
Approved*	1,590,826
S&E Approved	1,041,841
% H-1B = S&E	65.491%
H-1B Population (2009 estimate) ¹²¹	650,000
Estimated Number of H-1B S&E	425,688.6988

* excludes "occupation unknown"

STEP 3. S&E LABOR FORCE EXCLUDING H-1B VISAS

Once the number of H-1B visas held by scientists and engineers is estimated, it is possible to estimate the percent of workers in science and engineering who are foreign-born excluding H-1B visa holders. Of course, it is the responsibility of the government to keep records that would make this type of estimate unnecessary.

Table 3: S&E Labor Force
Excluding H-1B Visa Holders

	LABOR FORCE	H-1B LABOR FORCE ¹²²	S&E EXCLUDING H-1B
S&E Workers	5,023,635 ¹²³	425,689	4,597,946
Foreign-Born S&E Workers	1,198,130 ¹²⁴	425,689	772,441
% FB	23.8%	100.0%	16.8%

Endnotes

- 1 Ron Hira, "The H-1B and L-1 Visa Programs: Out of Control," Economic Policy Institute, Briefing Paper #280, October 14, 2010, p. 2 (<http://www.epi.org/publications/entry/bp280/>).
- 2 "Testimony of Michael S. Teitelbaum, Vice President, Alfred P. Sloan Foundation, before the Subcommittee on Technology and Innovation Committee on Science and Technology, U.S. House of Representatives, Washington, D.C., November 6, 2007," (http://democrats.science.house.gov/Media/File/Commdocs/hearings/2007/tech/06nov/Teitelbaum_testimony.pdf).
- 3 The "(S&E)" Science and Engineering classification used by the NSF refers to those who hold degrees in "Computer and Mathematical Sciences, Biological, Agricultural, and Environmental life Sciences, Physical Sciences, Social Sciences, and Engineering." The commonly used designations "STEM" (science, technology, engineering, and mathematics) and "S&T" (science and technology) refer to occupations that generally require a degree in S&E. These occupations are "Biological, Agricultural and Environmental life scientists, Physical scientists, Social scientists, Engineers, S&E postsecondary teachers." See, National Science Board, Science and Engineering Indicators: 2010, Chapter 3: Science and Engineering Labor Force, Table 3-1, "Classification of degree field and classification," NSB 10-01 (Arlington, VA: National Science Foundation), p. 3-10. Full report is available at <http://www.nsf.gov/statistics/seind10/pdfstart.htm>.
- 4 National Science Foundation, Scientists and Engineers Statistical Data System (SESTAT), Integrated Survey Data, 2006, <https://sestat.nsf.gov/sestat/sestat.html>, accessed March 21, 2011. The data was obtained by sorting persons by nativity, degree type, and occupational group. These figures include those employed in the social sciences.
- 5 U.S. Census Bureau, "Table 1332, Foreign or Foreign-Born Population, Labor Force, and Net Migration in Selected OECD Countries: 2000 and 2007," Statistical Abstract of the United States 2011. This level has remained relatively consistent, though the numbers may vary slightly by year and according to the source consulted.
- 6 FAIR Analysis of USCIS and NSF data. See Appendix.
- 7 NSB, Science and Engineering Indicators, Table 3-2, p. 3-11; NSF, "Science and Engineering Indicators 2010," Chapter 3 Highlights. The National Science Foundation's database places the number right in the middle at 5 million.
- 8 Ibid.
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