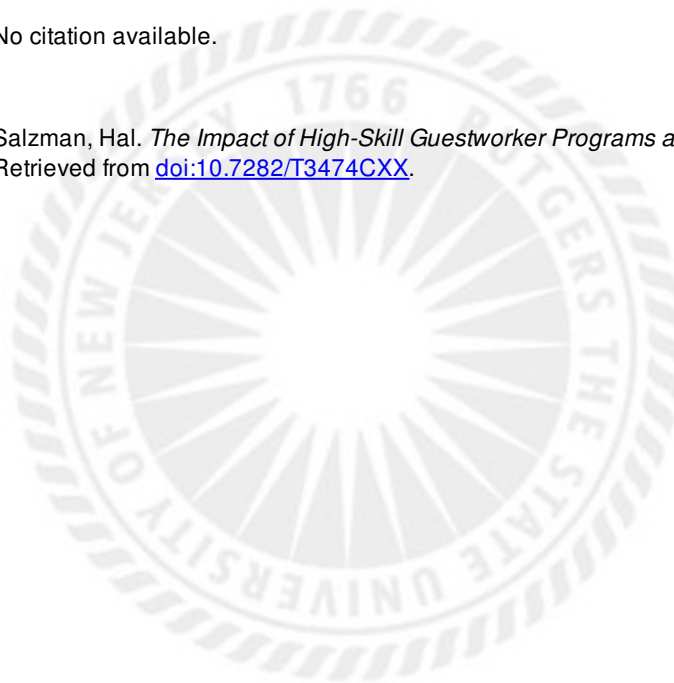


The Impact of High-Skill Guestworker Programs and the STEM Workforce

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“The Impact of High-Skill Guestworker Programs
and the STEM Workforce”

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For the Hearing on:

“The Impact of High-Skilled Immigration on U.S. Workers”

Submitted to the

Senate Committee on the Judiciary

U.S. Senate

25 February 2016

Mr. Chairman and members of the Committee, thank you for inviting me to speak today on the topic of high-skill labor demand and supply, and on the research and policy progress of the past year, since the Hearing of March 2015 on this subject.¹

In the past year we've seen the chasm between evidence and policy grow ever wider and deeper; the U.S. STEM workforce is being weakened through policies and guestworker programs that are increasingly exploited by shortsighted firms and industry groups. Despite rigorous and independent research by my colleagues and by me, of over a decade of research showing the U.S. educates an ample supply of qualified STEM workers, we see the continued expansion of policies that shift work to offshore labor. Instead of developing a globally competitive and internationally integrated workforce, all evidence and events from the past year suggest we are heading down a very different path consisting of legislation, policies, and programs to *substitute* guestworkers for U.S. STEM workers and graduates. These are programs that allow firms to subvert the free market in setting wage rates; these are policies that deny U.S. workers—whether native or immigrant, whether citizen or permanent resident—the career and compensation their education and skills should bring them if not for the huge, congressionally-created labor pool of guestworkers that industry has available to staff the vast majority of new IT openings.

To review the evidence about STEM workforce supply:²

- (1) Overall, our colleges and universities graduate twice the number of STEM graduates as find a job each year; that is, only about half of our STEM graduates enter the STEM workforce;
- (2) Of the entire workforce, only about a third of those with STEM degrees are employed in STEM jobs.
- (3) The glut of scientists at the Ph.D. level is so great in areas such as the life sciences, the National Institutes of Health, the global leader in public funding for health science and research, has an \$11 million program in 17 universities to develop alternative career

¹Statement of Hal Salzman: hearing on “Immigration Reforms Needed to Protect Skilled American Workers” submitted to the Senate Committee on the Judiciary, U.S. Senate, March 17, 2015 <http://dx.doi.org/doi:10.7282/T3ZK5JC3> Oral Testimony <http://dx.doi.org/doi:10.7282/T3ZK5JC3>

² The statistics cited are from: Salzman, Hal (2013). What Shortages? The Real Evidence About the STEM Workforce. *Issues in Science and Technology*, (Summer 2013), 58-67. <http://dx.doi.org/doi:10.7282/T3JS9S2T>; Statement of Hal Salzman: hearing on “Immigration Reforms Needed to Protect Skilled American Workers” submitted to the Senate Committee on the Judiciary, U.S. Senate, March 17, 2015 <http://dx.doi.org/doi:10.7282/T3ZK5JC3>; and Salzman, Hal & Kuehn, Daniel & Lowell, B. Lindsay (2013). Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends. *Report*, April 24, 2013 <http://dx.doi.org/doi:10.7282/T379469D>

paths for the nation's recent doctorates and post-doctoral Fellows.³ That is, the NIH is funding efforts to find alternative employment for the 30 to 50 percent of recent Ph.D.s who cannot find career employment in the sciences. A number of the country's leading scientists have started an organization, "Rescuing Biomedical Research"⁴ to do just that, in part by addressing the problem that "...the training pipeline produces more scientists than relevant positions in academia, government and the private sector are capable of absorbing... a growing number of PhDs are in jobs that do not take advantage of the taxpayers' investment in their lengthy education."⁵

(4) Engineers are graduating in sufficient numbers for nearly all hiring needs of industry. The one area that was in high demand a few years ago, petroleum engineering, is the exception that proves the rule. The number of graduates tripled when industry raised salaries beginning in the mid-2000s; a shortage was quickly followed by an oversupply that became a problem even before the most recent decline in oil prices. Last May, when oil had slipped to \$60 a barrel, the *Wall Street Journal* reported "There are too many [petroleum engineering] students coming out looking for jobs"; industry executives have suggested that newly-minted petroleum engineers start their careers working as roughnecks (a physically demanding job on the floor of oil rigs requiring a high school education).⁶ Now, even those jobs would be hard to come by.

(5) And that leaves us to consider the "T" of STEM – the tech workers, only about a third of whom have STEM degrees while another third do not have *any* four-year degree, and most of whom are in jobs that don't appear to require bachelors-level technology degrees:⁷ the desktop support technician, systems administrator, help line representative and tech writer positions that make up a large share of IT industry hiring; even most programming and coding jobs do not require a computer science degree.

It is, thus, a most interesting situation that of all the STEM fields, it is only a very particular slice of the technology sector that seems to be unable to find U.S. workers and seems unable, or perhaps unwilling, to use free-market mechanisms to recruit them. And, as the data on the education and background of its workforce indicate, the IT industry has a very large pool of potential college graduates to draw from; although it needs highly skilled workers, unlike the market for scientists, it is not employing people with very specialized education that takes a decade or more to acquire. It is peculiar, indeed, that

³ This is the "NIH Director's Biomedical Research Workforce Innovation Award: Broadening Experiences in Scientific Training (BEST)". <http://commonfund.nih.gov/workforce/fundedresearch>

⁴ <http://rescuingbiomedicalresearch.org/the-problem/>

⁵ Bruce Alberts, Marc W. Kirschner, Shirley Tilghman, Harold Varmus "Rescuing US biomedical research from its systemic flaws" *PNAS* 2014 111 (16) 5773-5777; April 14, 2014, doi:10.1073/pnas.140440211

⁶ "Who Will Hire a Petroleum Engineer Now?" Erin Ailworth

May 8, 2015, *Wall Street Journal* <http://www.wsj.com/articles/who-will-hire-a-petroleum-engineer-now-1431130173> Also see: "Dynamics of Engineering Labor Markets: Petroleum Engineering and Responsive Supply" (2016) Leonard Lynn, Hal Salzman, Daniel Kuehn in Freeman, R. and H. Salzman (eds.) *Engineering in a Global Economy* (forthcoming, 2016) NBER and University of Chicago Press. <http://dx.doi.org/doi:10.7282/T3VX0J51>

⁷ Salzman, Hal (2013). What Shortages? The Real Evidence About the STEM Workforce. *Issues in Science and Technology*, (Summer 2013), 58-67. <http://dx.doi.org/doi:10.7282/T3JS9S2T>; and Statement of Hal Salzman: hearing on "Immigration Reforms Needed to Protect Skilled American Workers" submitted to the Senate Committee on the Judiciary, U.S. Senate, March 17, 2015 <http://dx.doi.org/doi:10.7282/T3ZK5JC3>

despite financial resources second to none and an all-star reputation among our college graduates, the IT industry alone among the STEM industries has a special congressionally-provided and discounted labor supply and still claims it is unable to fill its ranks.

The industry claims of unmet demand – echoed by policy makers on both sides of the aisle, and from here to the White House – seem to have had their intended effect of inducing more students to graduate with computer science degrees this past year without the industry having to rely on market mechanisms; unlike the petroleum industry when they needed more workers, IT firms offered new graduates the same salaries as in years past,⁸ keeping average wages throughout this past decade at 1990s levels.⁹

(6) At the same time, most minorities are woefully underrepresented in STEM fields and although women are now on par with men in many science fields—fields where pay and career prospects for young Ph.D.s are abysmal¹⁰—they are far behind in most engineering and computer occupations. HBCUs say tech recruiters don't come calling for their engineering and computer graduates¹¹ and Silicon Valley, by all accounts, appears to have only marginal interest in bringing women and some minorities into their ranks.¹²

(7) The fundamental problem of U.S. and foreign IT outsourcing firms' hiring practices is the exclusion of U.S. workers—whether native or immigrant, citizen or permanent resident—which is made possible by specially crafted legislation for this purpose; it is legislation that serves as a congressionally-provided subsidy to a highly profitable industry to hire guestworkers at the expense of jobs for U.S. workers. But there is another, curiously overlooked outcome which is the creation of workforces that are highly segregated, that have a level of exclusivity seldom seen in the U.S. in the past half-century. That is, IT workforces that are not just majority, but levels over 70, 80, often over 90 percent one demographic group (in the case of one large IT company,

⁸ National Association of Colleges and Employers starting wage survey, January 27, 2016.

<http://www.nacweb.org/s01272016/STEM-grads-earn-highest-starting-salaries.aspx>

⁹ Salzman, Hal & Kuehn, Daniel & Lowell, B. Lindsay (2013). Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends. *Report*, April 24, 2013

<http://dx.doi.org/doi:10.7282/T379469D>

¹⁰ Stephan, P. (2012). *How economics shapes science*. Cambridge, MA: Harvard University Press;

Teitelbaum, M. (2008). "Structural disequilibria in biomedical research." *Science*, 321(5889), 644-645.

¹¹ As discussed by Lezli Baskerville, President & CEO, National Association for Equal Opportunity in Higher Education (the umbrella association for Historically Black Colleges and Universities [HBCUs] and Predominantly Black Institutions [PBIs]), at a panel discussion on "Immigration Reform: Tech Sector's Tool for Growing the Workforce & U.S. Economy" Thursday, May 23, 2013, Washington, D.C.

¹² "Silicon Valley struggles to hack its diversity problem" *Washington Post* Cecilia Kang and Todd C. Frankel July 16, 2015 https://www.washingtonpost.com/business/economy/silicon-valley-struggles-to-hack-its-diversity-problem/2015/07/16/0b0144be-2053-11e5-84d5-eb37ee8eaa61_story.html?tid=a_inl

"Tech: Where the women and minorities aren't" Elizabeth Weise, *USA Today* August 15, 2014

<http://www.usatoday.com/story/tech/2014/05/29/silicon-valley-tech-diversity-hiring-women-minorities/9735713/>

"Intel diversity stats show slow pace of progress" Elizabeth Weise, *USA Today*

February 3, 2016 <http://www.usatoday.com/story/tech/news/2016/02/03/intel-diversity-stats-show-slow-pace-progress/79663848/>

between 94% and 100% of its workforce at its various worksites are a single demographic group, and other news reports suggest this is not uncommon).¹³

And such discriminatory practices are not just a matter of supply-side government policies but also demand-side practices: there was almost total exclusion of any worker outside of one demographic group at one worksite on “...a nearly \$50 million government project won by Infosys for the District of Columbia.” One must ask why government contracts are allowed for projects in which hiring is exclusionary—discriminating against all but one demographic group and nearly all U.S. workers, excluding alike those who are American by birth or by choice.

In a country that strives for diversity, with great difficulty but nonetheless embraces it as a goal and codifies it in law, it is curious indeed that so many of our legislators are supporting policies and programs that lead to exclusionary employment practices to such extremes and at multiple levels: we see workforces comprised of single ethnic groups, of very limited age groups, as well as the more widely-noted exclusion of women, some minorities, and workers who are long-term members of the U.S. laborforce. As Russell Harrison, director of government relations at the IEEE-USA, noted, “...if companies were looking around the world to find the best possible candidates for their jobs, you would expect a distribution that was similar to the distribution of engineers on the planet, and that's not what you have.”¹⁴

(8) Then we come to some rather striking numbers that are hard to reconcile: An industry that claims to be hampered by a lack of labor announced layoffs of more workers than the total number of H-1Bs provided to the industry. Since 2000, the average number of announced layoffs per year, 176,000—ranging from a high of 696,000 in 2001 to a low of 37,000 in 2011—is more than double the number of H-1Bs available to the IT industry each year. Looking just at the past decade (and excluding the exceptionally high years after the dot-com crash), the number of layoffs averages over 97,000 per year, still much higher than the estimated 74,000 average number of H-1Bs that go to the IT industry each year.

What is also notable, according to data from the outplacement firm Challenger, Gray & Christmas which tracks layoffs, is that the technology industry layoffs comprise an average of 13% of *all* layoffs during the past decade; a layoff rate over four times the size of its share of overall employment.¹⁵ These data suggest the tech industry has a very high

¹³ “IT workers win key ruling against visa-using firm” Patrick Thibodeau *Computerworld* May 26, 2015 <http://www.computerworld.com/article/2926837/it-careers/it-workers-win-key-ruling-against-visa-using-firm.html> “Court case offers a peek at how H-1B-fueled discrimination works” Patrick Thibodeau *Computerworld* Jul 10, 2014 <http://www.computerworld.com/article/2489900/it-outsourcing/court-case-offers-a-peek-at-how-h-1b-fueled-discrimination-works.html>

¹⁴ “With H-1B visa, diversity doesn’t apply” Patrick Thibodeau and Sharon Machlis *Computerworld*, Aug 10, 2015 <http://www.computerworld.com/article/2956584/it-outsourcing/with-h-1b-visa-diversity-doesnt-apply.html?nsdr=true>

¹⁵ “Tech Sector Shed Over 79K in 2015, 13 Percent of All Cuts” Challenger, Gray & Christmas <https://www.challengergray.com/press/press-releases/tech-sector-shed-over-79k-2015-13-percent-all-cuts> Note that these are announced layoffs tracked by Challenger, Gray & Christmas of companies for their entire firm, sometimes including non-US workforces, and may not account for layoff announcements by all firms in all sectors; however, this is also limited to only publicly announced layoffs and does not include firings/layoffs that are not part of a publicly announced layoff. Thus, these figures do not reflect all

layoff rate compared to most industries, while at the same time accounting for the lion's share of guestworker hiring.

Most recently, the layoffs have become widespread even in the heart of the tech industry, Silicon Valley. *The Wall Street Journal* reports that more than a dozen well-funded tech companies in Silicon Valley “have announced layoffs, letting go hundreds of people that in most cases represented at least 15% of their staffs.”¹⁶

Yet, the tech industry is asking for even more guestworkers – from increasing H-1B visas and expanding *new* graduate work visas to issuing automatic green cards to students who hold a degree in anything from psycholinguistics to air conditioning technician to petroleum technician¹⁷—evidently with little consideration of whether there is demand for, or whether there is a glut of U.S. graduates.

Any legislation developed that echoes the recent I-Squared or SKILLS Act, and S. 744 of 2013, will expand the supply of guestworkers to levels *greater than the total number of new technology jobs*. These changes in immigration policy would provide enough guestworkers to fill every new job opening in the IT workforce, with a reserve large enough to allow firms to legally substitute young guestworkers for their incumbent workforce at even greater rates than they are doing currently.

In the past year, even without the expansion of current guestworker programs, we can see the impact of an already ample supply of IT guestworkers. Disney, Southern Cal Edison, Toys ‘R’ Us, and Qualcomm, among many others, laid off their IT workforces and promptly replaced them with IT firms employing offshore workers and guestworkers, sometimes making current employees train their lower-cost replacements before hitting the streets.¹⁸

(9) But the evidence on the impact of guestworkers is not just from independent research or the news before our own eyes. We can read statements directly from the companies themselves—SEC statements that is, in which firms are required by law to be truthful.

Why do these companies want guestworkers? Without an ample supply of guestworkers firms do *not* say they would be unable to find workers but, rather, quoting from the SEC filings by IT companies, the “...cost of doing business would increase” (Infosys, 20-F,

involuntary separations by a company or in an industry. Although industry comparisons likely reflect the relative size of layoffs between industries, there are no available data sources of all layoffs or other involuntary separations.

Author's calculation based on BLS employment tables for total employment, Jan. 2015 employment by industry. <http://www.bls.gov/web/empsit/tab4.txt>

¹⁶ “For Silicon Valley, The Hangover Begins” *The Wall Street Journal* Rolfe Winkler, February 20-21, 2016, p.1.

¹⁷ See DHS STEM Degree/CIP Codes: <http://www.ice.gov/sevis/stemlist.htm>

¹⁸ See Appendix for news stories on these and other companies. In one particularly egregious case, “SunTrust's severance agreement requires terminated employees to remain available for two years to provide help if needed, including in-person assistance, and to do so without compensation.” “Bank's severance deal requires IT workers to be on call for two years” Patrick Thibodeau *Computerworld* October 19, 2015.

2014). Moreover, they would have “...to replace existing offshore resources with local [U.S.] resources, or hire additional local resources, potentially at higher wages.” [emphasis added]. Accenture, for example, states that limitations on its supply of guestworkers would result in “...new or higher minimum salary requirements ... and increase costs.” Another U.S.-based IT outsourcing company says the “... cost of doing business in the U.S. would increase” if Congress restricts guestworker supply. That is, without the “Congressional discount” for guestworkers, the highly profitable IT industry would have to hire more U.S. workers – citizen *and* immigrant – and pay them more than guestworkers. To the SEC, firms never mention a problem about finding enough U.S. workers. Just price.

(10) And the numbers bear out these company statements. With two decades of large flows of guestworkers, average wage levels in IT have barely budged from where they were in the late 1990s.¹⁹ And, as noted above, starting salaries for computer science graduates have remained stagnant—unlike the situation when petroleum engineers really were in demand and salaries increased.²⁰ All rigorous studies that examine the effect of H-1B workers on IT wages find that, as currently structured, the guestworker programs depress wages.²¹ If there were truly a tight labor market, with widespread, high demand for IT workers, a free labor market would exhibit increasing wages; conversely, as a Brookings report observes, “it is likely that the extra supply of foreign-born workers does bring downward pressure on the wages of incumbent workers, as research suggests.”²² The most rigorous study of the direct impact of H-1B workers was conducted by three

¹⁹ Salzman, Hal & Kuehn, Daniel & Lowell, B. Lindsay (2013). Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends. *Report*, April 24, 2013
<http://dx.doi.org/doi:10.7282/T379469D>

²⁰ Lynn, L. Salzman, H. and Kuehn, D. (2016) “Dynamics of Engineering Labor Markets: Petroleum Engineering and Responsive Supply” in Freeman, R. and H. Salzman (eds.) *Engineering in a Global Economy* (forthcoming, 2016) NBER and University of Chicago Press.
<http://dx.doi.org/doi:10.7282/T3VX0J51>

²¹ Salzman, Hal & Kuehn, Daniel & Lowell, B. Lindsay (2013). Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends. *Report*, April 24, 2013
<http://dx.doi.org/doi:10.7282/T379469D>; Lazonick, William, Philip Moss, Hal Salzman, and Öner Tulum (2014) “Skill Development and Sustainable Prosperity: Cumulative and Collective Careers versus Skill-Biased Technical Change” The Academic-Industry Research Network, AIR Working Paper #14-12/01; “Immigration and the tech industry: As a labour shortage remedy, for innovation, or for cost savings?” Norman Matloff *Migration Letters*, Volume: 10, No: 2, pp. 211 – 228; Lazonick, William (2009). *Sustainable Prosperity in the New Economy? Business Organization and High-Tech Employment in the United States*, Upjohn Institute for Employment Research; Costa, Daniel. (2012). STEM labor shortages? Microsoft report distorts reality about computing occupations. *Economic Policy Institute*. Retrieved from <http://www.epi.org/publication/pm195-stem-labor-shortages-microsoft-report-distorts/>.

²² Rothwell and Ruiz, 2013. Although some studies claim wages are not depressed by H-1B workers, these studies typically are not directly examining H-1B workers but comparing native to immigrant workers, which is far different from an analysis of guestworkers as compared to U.S. workers, whether citizen or permanent resident, both of whom are part of the domestic workforce with quite different labor market effects from that of the guestworker labor market. For further discussion, see: Salzman, Hal (2013). What Shortages? The Real Evidence About the STEM Workforce. *Issues in Science and Technology*, (Summer 2013), 58-67. <http://dx.doi.org/doi:10.7282/T3JS9S2T>; and Statement of Hal Salzman: hearing on “Immigration Reforms Needed to Protect Skilled American Workers” submitted to the Senate Committee on the Judiciary, U.S. Senate, March 17, 2015
<http://dx.doi.org/doi:10.7282/T3ZK5JC3>

researchers with access to actual wage records of firms (using confidential data from the U.S. Department of the Treasury). Their findings are striking:

“H-1Bs substantially crowd out employment of other workers...has an insignificant effect on patenting...[and] H-1Bs lead to lower average employee wages while raising firm profits.”²³

As the exclusive focus on “costs” in SEC filings attest and the wage data suggest, the use of guestworkers plays an important role in keeping down wages. But this industry does not just rely on Congress to provide a lower-cost labor supply; this seems to be an industry that will directly subvert free and fair labor markets to deny U.S. workers jobs and market-based wages, as seen in the restraint of trade agreements among Silicon Valley firms that the late Steve Jobs instituted and enforced as CEO of Apple.²⁴ Lawsuits stated the collusion by a number of Silicon Valley firms who agreed not to hire workers from any of their competitors began in 1986 and continued until discovered in an anti-trust investigation by the Department of Justice in 2011.²⁵ The workers claim this collusion resulted in a “...pay package cap for prospective engineers, resulting in suppressed wages about 10 to 15 percent lower than what the engineers would have received in a natural market setting.”²⁶ Sued for \$3 billion in lost wages, the firms eventually settled with a \$415 million payment after the U.S. District judge found there was “‘ample evidence’ that Silicon Valley was engaged in ‘an overarching conspiracy’ against its own employees.”²⁷

In summary, there is overwhelming evidence from research to the daily news events to the legal statements from the companies themselves, that the public claims of shortages are questionable at best. In fact, the claims by themselves seem implausible. These are claims that IT companies alone among all the STEM fields can’t find workers—claims that our colleges do not produce enough graduates, claims that searching the globe for the best talent leads to finding only one, specific demographic group of very young workers,

²³ “The Effects of High-Skilled Immigration on Firms: Evidence from H-1B Visa Lotteries” Kirk Doran, Alexander Gelber, Adam Isen October 2015; Presented at the American Economic Association/ Allied Social Science Associations January 3-5, 2016, San Francisco, CA.

²⁴ In one article discussing the collusion and lawsuits, it is noted that Steve Jobs, while being a great innovator, “...the Apple founder was also profoundly anti-competitive. And in his final years, he may have gone out of his way to thwart the innovation of the underclass of software engineers responsible for Silicon Valley’s inventiveness.” “How Steve Jobs Undercut Silicon Valley’s Greatest Asset: Engineers; Court documents reveal the anti-competitive hiring practices imposed by Apple on other Silicon Valley stalwarts were the norm for years” (2014) Jeremy Quittner *Inc. Magazine* April 22.

<http://www.inc.com/jeremy-quittner/silicon-valley-wage-collusion-class-action.html>

²⁵ “Judge Approves \$415M Google, Apple Anti-Poaching Class Action Settlement” *Top Class Actions* Courtney Coren March 3, 2015 <http://topclassactions.com/lawsuit-settlements/lawsuit-news/50939-judge-approves-415m-google-apple-anti-poaching-class-action-settlement/>

²⁶ “Apple, Google Anti-Poaching Settlement Gets Final Approval” *Top Class Actions* Karina Basso September 4, 2015 <http://topclassactions.com/lawsuit-settlements/lawsuit-news/146971-apple-google-anti-poaching-settlement-gets-final-approval/>

²⁷ Court Rejects Deal on Hiring in Silicon Valley *New York Times* David Streitfeld August 8, 2014. <http://www.nytimes.com/2014/08/09/technology/settlement-rejected-in-silicon-valley-hiring-case.html>

claims that companies are hurting without workers they need—yet, despite being one of the more profitable industries on the planet, keeps average wage levels the same as when Bill Clinton was President. These are claims from an industry that fires more people in a year than it hires from the federally-provided H-1B guestworker labor pool, and that is allowed to maintain an exclusionary workforce at levels unprecedented in half a century. These are claims that strain credulity given such overwhelming and compelling evidence to the contrary.

So what has happened in the past year? STEM workers are still available in ample numbers; incumbent technology workers are laid off by the tens of thousands; and college graduates, *even our brightest young doctoral-level scientists*, still struggle to find employment in the sciences, much less careers and wages that will allow them to pay off staggering educational loans. And new legislation that will further undermine STEM careers can be expected from Congress this year. Meanwhile the tech industry continues to spend nearly *\$15 million a month* in Washington.²⁸ Perhaps this is the level of lobbying necessary to keep driving the wedge separating policy from evidence. In the words of one reporter, the new Silicon Valley slogan seems to be “Think *InDifferent*”²⁹ – with indifference to the quality of jobs and wages of the U.S. technical and professional workforce.

²⁸ According to OpenSecrets, the nonpartisan Center for Responsive Politics that maintains a database of all lobbying, in 2015 the total lobbying expenditures were \$121,801,501 by 239 computer companies and \$55,481,669 by 49 internet companies, with Google at the top of the list spending \$16.7 million in 2015, followed by Facebook and Amazon each spending over \$9 million, and computer companies Microsoft, Oracle, Qualcomm, Intel, IBM, Apple, Hewlett-Packard, Cisco Systems and Dell each spending between \$2.5 and \$8.5 million on lobbyists in 2015. <https://www.opensecrets.org/lobby/indusclient.php?id=B12>
<https://www.opensecrets.org/lobby/indusclient.php?id=B13>

²⁹ “The Real Legacy of Steve Jobs” Sue Halpern, *New York Review of Books*, February 11, 2016

BACKGROUND ARTICLES AND WEB SOURCES

H-1B Displacement stories in 2015-2016

Southern California Edison

Feb. 4, 2015 - *Southern California Edison IT workers 'beyond furious' over H-1B replacements.* About 500 workers affected. <http://www.computerworld.com/article/2879083/southern-california-edison-it-workers-beyond-furious-over-h-1b-replacements.html>

Feb. 20, 2015 – *A loophole in immigration law is costing thousands of American jobs.*

<http://www.latimes.com/business/hiltzik/la-fi-hiltzik-20150222-column.html>

Disney Parks and Resorts

Jan. 30, 2015 – *Walt Disney World information technology workers laid off.* <http://www.wesh.com/news/walt-disney-world-information-technology-workers-laid-off/31015168#galleria> This story was the first to discuss, in any detail, the outsourcing to HCL and the shifting of jobs overseas.

April 29, 2015 – *Fury rises at Disney over use of foreign workers.* <http://www.computerworld.com/article/2915904/it-outsourcing/fury-rises-at-disney-over-use-of-foreign-workers.html>

June 30, 2015 – *Pink Slips at Disney. But First, Training Foreign Replacements.*

http://www.nytimes.com/2015/06/04/us/last-task-after-layoff-at-disney-train-foreign-replacements.html?_r=0

The attorney for Disney workers estimates, in court papers filed in 2016, a layoff between 200 to 300.

Jan. 25, 2016: *Lawsuits Claim Disney Colluded to Replace U.S. Workers With Immigrants.*

<http://www.nytimes.com/2016/01/26/us/lawsuit-claims-disney-colluded-to-replace-us-workers-with-immigrants.html>

Jan. 28, 2016: *Laid-off IT workers muzzled as H-1B debate heats up.*

<http://www.computerworld.com/article/3027640/it-outsourcing/laid-off-it-workers-muzzled-as-h-1b-debate-heats-up.html>. This story compares and contrast Disney non-disparagement policy against one given by

Northeast Utilities (Now Eversource Energy) to IT workers. Includes photo of how American flags were used inside utility to protest layoff.

Fossil Group

May 16, 2015 – A Dallas Morning News columnist, Mitchell Schnurman, details a layoff in Fossil's IT department. Anywhere from 100 to 200 workers affected.

The story: *Fossil sells out its tech workers.* <http://www.dallasnews.com/business/columnists/mitchell-schnurman/20150516-schnurman-fossil-sells-out-its-tech-workers.ece>

Disney ABC TV

June 12, 2015 – *In a turnabout, Disney ABC TV cancels plans to outsource IT jobs.*

<http://www.computerworld.com/article/2934978/it-outsourcing/in-a-turnabout-disney-abc-tv-cancels-plans-to-outsource-it-jobs.html>

Disney ABC is separate from Disney Parks and Resorts. It told about 35 application developers that they would be laid off. But it reversed course and rescinded the layoffs.

June 16 – *In Turnabout, Disney Cancels Tech Worker Layoffs.* <http://www.nytimes.com/2015/06/17/us/in-turnabout-disney-cancels-tech-worker-layoffs.html?ref=topics>

June 17 – *Disney reverses plan to replace tech employees with outsourced workers.* <http://www.latimes.com/business/la-fi-disney-technology-h1b-20150617-story.html>

Catalina Marketing

June 24, 2015 -- *Catalina Marketing IT jobs being outsourced.* <http://www.fox13news.com/news/7627985-story>

About 50 IT employees were being replaced, according to this report, by employees of an offshore outsourcing firm.

Citizens Bank

Aug. 13, 2015 - *As it sets IT layoffs, Citizens Banks shifts work to India via Web.*

<http://www.computerworld.com/article/2970435/it-outsourcing/as-it-sets-it-layoffs-citizens-bank-shifts-work-to-india-via-web.html>

H-1B workers are being used in the transfer of work. Employees estimated that between 250 to 350 IT workers were losing their jobs.

Qualcomm

Aug. 23 – San Diego Union-Tribune columnist Dan McSwain discusses the use of foreign workers.

<http://www.sandiegouniontribune.com/news/2015/aug/23/h1b-visa-foreign-competitors-next-cubicle/>

Toys 'R' Us

Sept. 29 - *Toys 'R' Us Brings Temporary Foreign Workers to U.S. to Move Jobs Overseas.*

<http://www.nytimes.com/2015/09/30/us/toys-r-us-brings-temporary-foreign-workers-to-us-to-move-jobs-overseas.html>

This story also reports on accounting job replacement layoffs at Cengage Learning, and IT layoffs at New York Life.

Caterpillar

Oct. 5 – Phil Luciano, a columnist at the Journal Star in Peoria, Ill., describes how Caterpillar workers are training their replacements. The Story: *Some Cat workers in Morton will be training their own overseas replacements.*

<http://www.pjstar.com/article/20151005/NEWS/151009663>

SunTrust Banks

Oct. 19 – Approximately 100 IT employees were told of their layoffs, and the shift of their work overseas. H-1B workers were used.

The story: *Bank's severance deal requires IT workers to be on call for two years.*

<http://www.computerworld.com/article/2994787/it-careers/bank-s-severance-deal-requires-it-workers-to-be-on-call-for-two-years.html?nsdr=true>

Cengage Learning

Nov. 9 - *Fury and fear in Ohio as IT jobs go to India.* <http://www.computerworld.com/article/3002681/it-outsourcing/fury-and-fear-in-ohio-as-it-jobs-go-to-india.html> Approximately 100 IT jobs were affected.

Hertz

Feb. 11, 2016 - Hertz is cutting about 230 IT workers. Numerous Labor Condition Applications have been filed for its main technology city in Oklahoma. The story: *Hertz cuts IT jobs as it shifts work to IBM.*

<http://www.computerworld.com/article/3032350/it-careers/hertz-cutting-it-jobs-as-its-shifts-to-ibm.html>

Related stories –Discrimination in H-1B use/outcomes

Website with current news –“Techsploitation”

<https://beta.cironline.org/investigations/techsploitation/>

May 26, 2015: *IT workers win key ruling against visa-using firm.* <http://www.computerworld.com/article/2926837/it-careers/it-workers-win-key-ruling-against-visa-using-firm.html>

Aug 10, 2015 – *With H-1B visa, diversity doesn't apply.* <http://www.computerworld.com/article/2956584/it-outsourcing/with-h-1b-visa-diversity-doesnt-apply.html?nsdr=true>

Apple is touting its efforts to improve the diversity of its workforce. But in 2013, Infosys, an India-based provider of IT services, had 509 workers assigned to Apple sites in Cupertino, Calif. Of that number, 499 -- or 98% -- are listed as Asian, with the remaining 10 identified as either white or black, according to government records.

“Court case offers a peek at how H-1B-fueled discrimination works” Patrick Thibodeau Computerworld
Jul 10, 2014 <http://www.computerworld.com/article/2489900/it-outsourcing/court-case-offers-a-peek-at-how-h-1b-fueled-discrimination-works.html>

“Silicon Valley struggles to hack its diversity problem” *Washington Post* Cecilia Kang and Todd C. Frankel
July 16, 2015 https://www.washingtonpost.com/business/economy/silicon-valley-struggles-to-hack-its-diversity-problem/2015/07/16/0b0144be-2053-11e5-84d5-eb37ee8eaa61_story.html?tid=a_inl

“Intel diversity stats show slow pace of progress” Elizabeth Weise, *USA Today* February 3, 2016
<http://www.usatoday.com/story/tech/news/2016/02/03/intel-diversity-stats-show-slow-pace-progress/79663848/>

July 30, 2015 – *Despite H-1B lottery, offshore firms dominate visa use.*

<http://www.computerworld.com/article/2954612/it-outsourcing/despite-h-1b-lottery-offshore-firms-dominate-visa-use.html>

Oct. 1, 2015 – *Increasingly, U.S. IT workers are alleging discrimination.*

<http://www.computerworld.com/article/2988621/it-careers/increasingly-u-s-it-workers-are-alleging-discrimination.html>

Related, April 15, 2015: *IT worker's lawsuit accuses Tata of discrimination.*

<http://www.computerworld.com/article/2910327/it-outsourcing/it-workers-lawsuit-accuses-tata-of-discrimination.html>

Nov. 10, 2015 – *Large Companies Game H-1B Visa Program, costing the U.S. jobs.*

<http://www.nytimes.com/2015/11/11/us/large-companies-game-b-1b-visa-program-leaving-smaller-ones-in-the-cold.html>

White House position on replacements

July 17, 2015: Jeh Johnson, the secretary of the U.S. Dept. of Homeland Security, tells the House Judiciary Committee that H-1B workers “are not supposed to replace Americans.” Story:

<http://www.computerworld.com/article/2949613/it-outsourcing/will-the-white-house-disappoint-on-b-1b-displacements.html?nsdr=true>

Nov. 24, 2015: Former White director Carol M. Browner resigns from Infosys Board. Story:

http://articles.economicstimes.indiatimes.com/2015-11-24/news/68536322_1_infosys-ltd-infosys-board-ravi-venkatesan.

Previous report, Nov. 13, 2014: *Hypocrisy and connections help IT outsourcing firms.*

<http://www.computerworld.com/article/2847344/hypocrisy-and-connections-help-it-outsourcing-firms.html>

Jan. 30, 2016: White House announces Computer Science for All Initiative. Two of the contributing companies, India based Infosys and Tata Consultancy Services, contribute the White House effort.

Source: <https://www.whitehouse.gov/the-press-office/2016/01/30/fact-sheet-president-obama-announces-computer-science-all-initiative-0>

Infosys and Tata are two of the largest users of the H-1B visa, and have been involved in displacements at Southern California Edison, Northeast Utilities and other firms.

Investigations:

April 9, 2015: Ten U.S. Senators sign letter requesting that the U.S. Dept. of Justice, Dept., of Homeland Security, and U.S. Dept., of Labor, investigate the displacements at Southern California Edison and other firms. Source: http://www.sessions.senate.gov/public/_cache/files/d7b663ca-bdbf-460d-afdb-bc48e2ce1d98/letter-to-ag-holder-secretaries-johnson-perez-re-socal-edison-4.9.2015.pdf

The DOL says it has no grounds to take action because the displacements did not violate the law.

Feb. 3, 2016, statement by a DOL spokesman:

“The DOL investigations of Infosys and Tata are concluded. Infosys and Tata are H-1B dependent employers; however, they were found to have only hired H-1B exempt workers. Therefore, the displacement & recruitment provisions do not apply to any of the H-1B applications examined and no violations were found.” Story: <http://www.computerworld.com/article/3030270/it-careers/sen-blumenthal-demands-lifting-of-it-gag-order.html?nsdr=true>

Academic use of H-1B

Jan. 5, 2016, *Industry, universities hide workforce of 100,000 extra foreign white-collar H-1B employees*, Neil Munro, a reporter for Brietbart. <http://www.brietbart.com/big-government/2016/01/05/industry-universities-hide-workforce-100000-extra-foreign-white-collar-h-1b-employees/>

Jan. 19, 2016, *Academic H-1Bs by the numbers*, Beryl Lieff Benderly, *Science*, a publication of the American Association for the Advancement of Science. <http://www.sciencemag.org/careers/2016/01/academic-h-1bs-numbers>

Norm Matloff, blog, Upon Closer Inspection, Jan., 19, 2016, *Malkin on Rubio/Microsoft*, <https://normsaysno.wordpress.com/2016/01/19/malkin-on-rubiomicrosoft/> and,

Jan. 7, 2016, *Major Brietbart Analysis of H-1B and related issues.*

<https://normsaysno.wordpress.com/2016/01/07/major-brietbart-analysis-of-h-1b-and-related-issues/>

Using university H-1B exemptions to circumvent restrictions for industry – the case of Wright State University

“Wright State ‘poster child’ for abuses of worker visa program” Josh Sweigart *Dayton Daily News* Oct. 4, 2015
<http://www.mydaytondailynews.com/news/news/local-education/wright-state-poster-child-for-abuses-of-worker-vis/nns2P/>

“A new kind of visa ‘creativity’” *Science* Beryl Lief Benderly Oct. 7, 2015
<http://www.sciencemag.org/careers/2015/10/new-kind-visa-creativity>

Major books on displacements and H-1B/Guestworker background

Nov. 10, 2015, book, *Sold Out: How High-Tech Billionaires & Bipartisan Beltway Crapweasels Are Screwing America’s Best & Brightest* by Michelle Malkin and John Miano, takes an in-depth look at H-1B displacements. This analysis includes interviews with displaced U.S. workers.
http://www.amazon.com/gp/product/B00VBW3SYQ?ie=UTF8&isInIframe=1&n=283155&redirect=true&ref_=dp_proddesc_0&s=books&showDetailProductDesc=1#iframe-wrapper

Falling Behind? Boom, Bust, and the Global Race for Scientific Talent
Michael S. Teitelbaum. Includes analysis of the business role in creating the STEM shortage narrative and lobbying for guestworker increases.
<http://press.princeton.edu/titles/10208.html>

Displacement and Layoffs

There are no good data on the total number of IT layoffs. Challenger, Gray & Christmas is considered to have the most reliable data available on *announced* cuts but industry experts find that most IT cutbacks – especially those involving offshore outsourcing – are never announced. The large layoffs, like SCE with 500, or Disney at 200-300 at one time do not appear to be common. IT displacements typically occur over a period of many months, sometimes years, as more and more work is transferred to offshore outsourcing firms, unit by unit within firms.

Challenger estimated about 79,000 tech job cuts in 2015.
<http://www.challengergray.com/press/press-releases/tech-sector-shed-over-79k-2015-13-percent-all-cuts>

“Outsourced, at home: Hyped as source of tech talent, H-1B visas usher in cheap replacements for US workers” Farah Stockman, *Boston Globe* March 31, 2013
<https://www.bostonglobe.com/opinion/2013/03/30/visa-program-has-been-hijacked-outsourcers/VAg6o9KgS2tuoZ3WbmaqeK/story.html#>

IT hiring is not tracked reliably and estimates of hiring ranged from the low 100,000 to the 150,000 range. BLS data is the common source but it is analyzed in different ways, with different findings. On industry group analysis, CompTIA: <http://www.computerworld.com/article/3033091/it-careers/these-are-the-fastest-growing-it-jobs.html>

Victor Janulaitis of Janco Associates is worried about the impact of outsourcing and wonders how many IT pros have dropped out of the workforce, or at least IT work. “Forecast fewer new IT jobs will be created in 2016 than in 2015”
<http://www.e-janco.com/Press/2016/2016-02-08-Fewer-IT-Jobs-in-2016.html> victor@e-janco.com

Increasingly governments use IT offshore outsourcers. This is a notable change from just over a decade ago when governments were requiring contractors to employ workers in the U.S. on government contract work (for history, see: Salzman, 2013 “What Shortages? The Real Evidence About the STEM Workforce” *Issues in Science and Technology*
<http://dx.doi.org/doi:10.7282/T3JS9S2T>

The Affordable Care Act – a program that mandated a lot of new IT also became a vehicle for offshore work: <http://www.computerworld.com/article/2489900/it-outsourcing/court-case-offers-a-peek-at-how-h-1b-fueled-discrimination-works.html>
And with White House ties:

<http://www.computerworld.com/article/2847344/hypocrisy-and-connections-help-it-outsourcing-firms.html>
http://articles.economictimes.indiatimes.com/2015-11-24/news/68536322_1_infosys-ltd-infosys-board-ravi-venkatesan
Some of the offshore firms are believed to have federal contracts.
<https://www.infosyspublicservices.com/newsroom/Pages/headquarters-delivery-center-maryland.aspx>
The Obama administration, for some of its policies and programs to expand computer programming courses, appears to be relying on H-1B using firms, noted in the layoffs and replacement by guestworkers stories widely reported.
<http://www.computerworld.com/article/3028022/it-careers/white-house-education-plan-leaves-visa-critics-flabbergasted.html>

Background

Background on history of current shortage claims

Salzman, Hal (2013). What Shortages? The Real Evidence About the STEM Workforce. *Issues in Science and Technology*, (Summer 2013), 58-67. <http://dx.doi.org/doi:10.7282/T3JS9S2T>
<http://www.issues.org/29.4/hal.html>

Why is the widely accepted view of shortage at odds with study after study that has found the U.S. science and engineering supply to be strong and improving? And why are policymakers and industry leaders offering proposals that go against this solid body of evidence? This article examines the recent history of the "shortage" claims and implications for policy

Detailed statistics and background

Salzman, Hal. Statement of Hal Salzman: hearing on "Immigration Reforms Needed to Protect Skilled American Workers" submitted to the Senate Committee on the Judiciary, U.S. Senate, March 17, 2015.
<http://dx.doi.org/doi:10.7282/T3ZK5JC3>
<http://www.judiciary.senate.gov/download/salzman-testimony>

Currently, U.S. colleges graduate far more scientists and engineers than find employment in those fields every year—about 200,000 more—while the IT industry fills as much as two-thirds of its entry-level and early-career positions with guestworkers. At the same time, IT wages have stagnated for over a decade. Current H-1B and L visa policies and the proposed changes that increase the supply of STEM guestworkers are likely to accelerate the already deteriorating career prospects for STEM graduates and workers. New provisions in the proposed Senate bill will also have detrimental impact on U.S. colleges and universities.

Salzman, Hal & Lowell, B. Lindsay (2008). Making the Grade. *Nature*, 453(1 May 2008), 28-30.
<http://dx.doi.org/doi:10.7282/T3Q241WW>

Educational performance of U.S. and International students and workforce supply

Salzman, Hal (2014). STEM Grads Are at a Loss. *U.S. News & World Report*, Sept 15(2014)
<http://dx.doi.org/doi:10.7282/T33B622G>
<http://www.usnews.com/opinion/articles/2014/09/15/stem-graduates-cant-find-jobs>

All credible research finds the same evidence about the STEM workforce: ample supply, stagnant wages and, by industry accounts, thousands of applicants for any advertised job. The real concern should be about the dim employment prospects for our best STEM graduates: The National Institutes of Health, for example, has developed a program to help new biomedical Ph.D.s find alternative careers in the face of “unattractive” job prospects in the field. Opportunities for engineers vary by the field and economic cycle – as oil exploration has increased, so has demand (and salaries) for petroleum engineers, resulting in a near tripling of petroleum engineering graduates. In contrast, average wages in the IT industry are the same as those that prevailed when Bill Clinton was president despite industry cries of a “shortage.” Overall, U.S. colleges produce twice the number of STEM graduates annually as find jobs in those fields.



MAKING SENSE

The Bogus High-Tech Worker Shortage: How Guest Workers Lower US Wages

<http://www.pbs.org/newshour/making-sense/the-bogus-high-tech-worker-sho/>

... this is a debate about America's policies for creating good jobs, strong technology and an innovation-based economy. We welcome immigrants and support an immigration policy that draws the best and the brightest and provides opportunity to newcomers. But policy should not be about targeting government giveaways to a few industries by supplying ever more guest workers when there is an ample domestic supply of qualified graduates and workers.

We're Already Generating More Qualified Students Than Jobs

Our analysis of the data finds that high-skill guest worker programs supply the preponderance of all new hires for the IT industry. The inflow of guest workers is equal to half of all IT hires each year and fully two-thirds of annual hires of workers younger than 30. Can it be a coincidence that wages in IT jobs have been stagnant for over a decade?

Salzman, Hal & Kuehn, Daniel & Lowell, B. Lindsay (2013). Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends. *Report*, April 24, 2013

<http://dx.doi.org/doi:10.7282/T379469D>

<http://www.epi.org/publication/current-proposed-high-skilled-guestworker/>

In 2011, the number of college-educated guestworkers under the age of 30 in IT was equal to two-thirds of all the 166,000 new college-educated IT job holders under the age of 30. At a time when Congress is proposing to dramatically increase the number of skilled guestworkers available to IT and other industries, it is important to consider the adverse impact of increasing the guestworker flow on U.S. college graduates just entering the workforce and on those in school making plans for their future.