

# Obama's Immigration Executive Action And STEM Workers

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Jo Yong hak/Reuters

“Are we a nation that educates the world’s best and brightest in our universities, only to send them home to create businesses in countries that compete against us? Or are we a nation that encourages them to stay and create jobs here, create businesses here, create industries right here in America?”<sup>1</sup>

BARACK OBAMA

## INTRODUCTION

On November 20, 2014, President Barack Obama presented his Immigration Accountability Executive Action to the U.S. public, an initiative of the greatest importance because it defers the deportation of more than 5 million immigrants. In addition, the proposal contains a series of measures to recruit and facilitate the permanence of qualified immigrants, particu-

larly foreign graduates from U.S. universities in the fields of science, technology, engineering, and mathematics (STEM):

- a) Provide portable work authorization for high-skilled workers awaiting Lawful Permanent Resident (LPR) status and their spouses;
- b) Enhance options for foreign entrepreneurs; and
- c) Strengthen and extend on-the-job training for STEM (science, technology, engineering, and mathematics) graduates of U.S. universities.<sup>2</sup>

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What is Obama's interest in recruiting and retaining foreign scientists and bachelors in technology? Is it that the United

Low wages in companies employing  
STEM workers are insufficiently attractive  
for the U.S.-born. This may partially explain  
the growth in immigrants in this kind of work.

States does not have a sufficient supply of this kind of qualified labor? Why implement a specific policy to offer jobs to foreigners recently graduated in STEM fields?

SCARCITY OR OVER-SUPPLY OF STEM WORKERS?

In the United States and many industrialized countries, a broad consensus exists that workers in STEM areas are fundamental for innovation processes and increasing productivity given that their work is linked to the generation of ideas, technology, companies, and industries. One example of this is the increase in the number of U.S. university graduates in these fields: the number of degrees in STEM fields grew 55 percent, jumping from 1.35 million in the 2002-2003 academic year, to more than 2 million in 2011-2012. In those same years, the graduates in other fields increased only 37 percent.<sup>3</sup> Despite this, U.S. companies still complain of a lack of available labor in STEM areas.

For example, Microsoft states that “throughout the nation and in a wide range of industries, there is an urgent demand for workers trained in the STEM fields—science, technology, engineering, and mathematics— yet there are not enough people with the necessary skills to meet that demand and help drive innovation.”<sup>4</sup> They say, for example, that between 2010 and 2020, the U.S. economy will produce more than 120 000 jobs in the field of computing every year, jobs that require at least a bachelor’s degree. However, only 40 000 graduates with bachelor’s degrees are produced every year, which, for Microsoft is a clear indicator that the demand for labor is greater than the supply, at least in this field. This leads them to propose that the number of H-1B visas should be increased to temporarily hire migrants highly skilled in STEM fields to cover the specialized labor needed in production.

Arguments of this kind would justify to a certain extent President Obama’s executive action, aimed at recruiting, retaining, training, and increasing the number of immigrant workers with STEM capabilities. However, another series of studies have shown the opposite. Work by researchers like Salzman, Kuehn, and Lowell, who analyze the supply and de-

mand of professionals in these areas, maintain that “for STEM graduates, the supply exceeds the number hired each year by nearly two to one, depending on the field of study. Even in engineering, U.S. colleges have historically produced about 50 percent more graduates than are hired into engineering jobs each year.”<sup>5</sup> They also state that about half the 2009 graduates from computing majors who had a job one year after finishing their studies were working in fields different from those they had studied, either because they did not find work in information technology (IT) companies or because the working conditions and wages were not sufficiently attractive there.

The most important result of this study is linked precisely to the issue of wages. The authors found that between 2001 and 2010, wages for IT company workers practically stagnated, decreasing slightly during high-unemployment periods, but not returning to the wage levels of the end of the 1990s. The low wages in companies employing workers trained in STEM fields are insufficiently attractive for native-born workers. This might explain not only the important growth in immigrants in this kind of work, but also that congresspersons, senators, companies, and even President Obama himself insist on the approval of measures to favor the immigration of workers trained in these areas. Therefore, the authors conclude, “Immigration policies that facilitate large flows of [highly-skilled] guestworkers will supply labor at wages that are too low to induce significant increases in supply from the domestic workforce.”<sup>6</sup>

EVIDENCE

To respond to the questions posed at the beginning of this article, we present here a brief analysis of the supply of U.S.-born and immigrant workers with bachelor’s degrees and graduate work in STEM fields, as well as the sector or branch of industry that employs them. The idea is to present empirical evidence about whether there is a scarcity or over-supply of labor in the United States, using data from the 2013 American Community Survey (ACS). The results show that, of the total employed workforce in 2013, 10.3 million workers had bachelor’s degrees or graduate studies in some STEM area: about 7.4 million were U.S.-born, representing 71 percent of the total, and the remaining 2.9 million (29 percent) came from other countries. This shows the importance of skilled immigrants trained in STEM areas.

Another piece of data that should be underlined is that of the 10.3 million workers with training in one of the STEM

fields, only 35 percent work in activities involving their field of training. Therefore, a considerable majority of 65 percent do something else. This reveals, contrary to what companies like Microsoft are saying, that in the United States there is, rather, an over-supply of qualified personnel, but they are employed in tasks that do not involve their area of study.<sup>7</sup>

On the other hand, not all employees of science and technology companies have formal training in these areas. If we analyze the occupational structures of STEM firms, we can see that a little over two-thirds of their 5.5 million employees had studies in STEM fields (65.7 percent). However, if we only take into consideration U.S.-born workers, this percentage drops to 60.4, which is much lower than the percentage among Mexicans (67.1), Asians (81.6), and immigrants from other countries (74.4). This might explain the greater demand for foreign professionals to take some of the jobs not held by U.S.-born workers (see Table 1).

Clearly, the important demand for immigrant professionals by STEM companies cannot be explained by the scarcity

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to these two fields.

of U.S.-born workers, but it could be linked to other U.S. labor market conditions, like the stagnation of wage levels in these companies. Some authors think that this situation has discouraged U.S. students from training in STEM areas even though the demand for this kind of labor remains high and has created incentives for them to look for work in other, better-paid occupations.

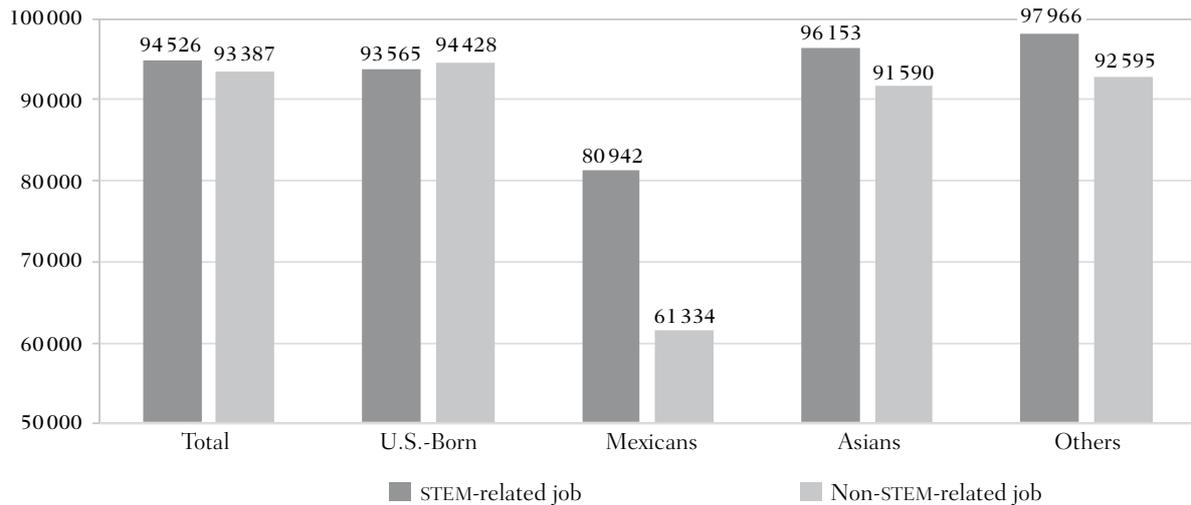
Our results show that the average annual income of workers with training in STEM fields is slightly higher than that of those who work in other areas of the economy (US\$94 526 vs. \$93 387). This shows that the U.S. labor market still offers a wage incentive. However, if we analyze the average annual income but take into account the country or region of origin,

Field of Expertise	Total	U.S.-Born	Immigrants		
			Mexicans	Asians	Others
<i>Total Population</i>	5 540 238	3 961 060	38 809	1 053 728	486 641
Population with STEM Field Training	3 641 526	2 393 583	26 056	859 939	361 948
Computing	871 394	569 395	5 315	208 543	88 141
Mathematics	180 854	127 404	465	36 719	16 266
Engineering	1 910 314	1 217 458	17 508	491 381	183 967
Physics and Life Sciences	678 964	479 326	2 768	123 296	73 574
Training in Other Areas	1 898 712	1 567 477	12 753	193 789	124 693
<i>Total Population (%)</i>					
Population with STEM Field Training	65.7	60.4	67.1	81.6	74.4
Computing	15.7	14.4	13.7	19.8	18.1
Mathematics	3.3	3.2	1.2	3.5	3.3
Engineering	34.5	30.7	45.1	46.6	37.8
Physics and Life Sciences	12.3	12.1	7.1	11.7	15.1
Training in Other Areas	34.3	39.6	32.9	18.4	25.6

**Source:** Estimates by the authors using data from IPUMS, American Community Survey (ACS), 2013, <https://usa.ipums.org/usa/>.

\***Note:** The classification of STEM areas of knowledge and jobs was taken from David Langdon, George McKittrick, David Beede, Beethika Khan, and Mark Doms, "STEM: Good Jobs Now and for the Future," U.S. Department of Commerce. Economics and Statistics Administration, <http://www.esa.doc.gov/Reports/stem-good-jobs-now-and-future>, 2011.

GRAPH 1  
 AVERAGE ANNUAL INCOME OF THE EMPLOYED U.S. POPULATION WITH STEM TRAINING  
 BY COUNTRY/REGION OF BIRTH AND KIND OF JOB (2013)



Source: Developed by the authors based on data from IPUMS, American Community Survey (ACS), 2013, <https://usa.ipums.org/usa/>.

**Mexican immigrant workers at STEM firms receive a considerably higher average annual income than those employed in other areas: the wage gap is almost US\$20000 a year.**

we can see that in the case of U.S.-born workers, the ratio is the inverse: that is, people with STEM training who work in that field have a slightly lower average annual income than their countrymen and women who do other kinds of work (US\$93 565 vs. US\$94 428). In contrast, among the immigrant population, workers at STEM firms receive a considerably higher average annual income than those employed in other areas.

For example, among Mexican immigrants, the wage gap between workers with STEM jobs and others is almost US\$20000 a year. Among Asians, the gap is US\$4 563, and among workers from other countries, it is US\$5 372 (see Graph 1). Taking into account that the wage incentive is greater for immigrant STEM workers than it is for the U.S.-born, it is to be expected that the latter would opt to study or work in other kinds of jobs outside the STEM field.

the contrary, the empirical evidence and findings show that two-thirds of STEM professionals work in fields different from the one they were trained in. Why, then, does a government initiative like the one Obama announced seek to recruit qualified workers from other countries instead of among the U.S.-born population? Having the world’s best and brightest qualified workers, as the president said in his November 20, 2014 speech, undoubtedly contributes to raising U.S. companies’ competitiveness and earnings, as well as that of the economy as a whole. However, it would seem that for U.S. bachelors in technology and scientists, it is more attractive to work in companies that do not necessarily have anything to do with science and technology. And that is precisely where the best and brightest qualified workers from other countries come into the picture. Just like in other moments of migrations to the United States, such as during the massive flow of medium-skilled and unskilled workers in the last century, these are the ones who historically have been willing to take the jobs not covered by the U.S.-born population. **MM**

FINAL COMMENT

These research results reinforce the notion that the United States has no scarcity of STEM trained qualified workers. On

NOTES

<sup>1</sup> Remarks by President Barack Obama in an address to the nation on immigration, <http://www.whitehouse.gov/issues/immigration/immigration-action#>, November 20, 2014.

- <sup>2</sup> The White House, "Immigration Accountability Executive Action," Office of the Press Secretary, <http://www.whitehouse.gov/the-press-office/2014/11/20/fact-sheet-immigration-accountability-executive-action>, November 20, 2014.
- <sup>3</sup> United States Government Accountability Office, "Science, Technology, Engineering, and Mathematics Education. Assessing the Relationship between Education and the Workforce," Report to Congressional Requesters, GAO-14-374, <http://www.gao.gov/assets/670/663079.pdf>, May 2014.
- <sup>4</sup> Microsoft Corporation, "A National Talent Strategy: Ideas for Securing U.S. Competitiveness and Economic Growth," <http://www.microsoft.com/en-us/news/download/presskits/citizenship/MSNTS.pdf>, 2012, p. 4.
- <sup>5</sup> Hal Salzman, Daniel Kuehn, and B. Lindsay Lowell, "Guestworkers in the High-skill U.S. Labor Market. An Analysis of Supply, Employment, and Wage Trends," EPI Briefing Paper no. 359, Economic Policy Institute, <http://www.epi.org/publication/bp359-guestworkers-high-skill-labor-market-analysis/>, April, 2013, p. 7.
- <sup>6</sup> *Ibid.*, p. 3.
- <sup>7</sup> Daniel Costa, "STEM Labor Shortages? Microsoft Report Distorts Reality about Computing Occupations," Economic Policy Institute, Policy Memorandum no. 195, <http://www.epi.org/publication/pm195-stem-labor-shortages-microsoft-report-distorts/>, November 2012.