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ALWAYS IN DEMAND:
The Economic Contributions of Immigrant Scientists and Engineers

With the U.S. economy in the midst of a prolonged slump, it's hard to believe that any industry would actually benefit from having more workers. But that is precisely the case when it comes to those industries which depend upon highly skilled scientists and engineers. The United States has long faced a dilemma in this respect: the U.S. economy is capable of absorbing more high-tech professionals than the U.S. educational system produces. That is one reason so many U.S. scientists and engineers are immigrants. In "STEM" occupations (science, technology, engineering, and mathematics), the foreign-born account for 26.1 percent of workers with PhDs and 17.7 percent of those with master's degrees.[1] Even more U.S. scientists and engineers would be immigrants if not for the arbitrary limits imposed by the U.S. immigration system, particularly the inadequate supply of green cards and H-1B visas. Given that STEM professionals tend to *create* jobs through their innovative work, such limits are economically self-defeating.

Immigrant scientists and engineers create new jobs.

- According to a 2012 report from the Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce, research has found that "every foreign-born student who graduates from a U.S. university with an advanced degree and stays to work in STEM has been shown to create on average 2.62 jobs for American workers—often because they help lead in innovation, research, and development."[2]

- A 2011 report from the Partnership for a New American Economy concluded that immigrants were founders of 18 percent of all Fortune 500 companies, many of which are high-tech giants. As of 2010, these companies generated $1.7 trillion in annual revenue, employed 3.6 million workers worldwide, and included AT&T, Verizon, Procter & Gamble, Pfizer, Comcast, Intel, Merck, DuPont, Google, Cigna, Sun Microsystems, United States Steel, Qualcomm, eBay, Nordstrom, and Yahoo![3]

- A 2007 study by researchers at Duke University and Harvard University concluded that one-quarter of all engineering and technology-related companies founded in the United States from 1995 to 2005 "had at least one immigrant key founder," and that these companies "produced $52 billion in sales and employed 450,000 workers in 2005." Moreover, these immigrant-founded firms have "contributed greatly to the country's economic growth over time."[4]

- A 2006 study by the National Venture Capital Association found that, during the previous 15 years, immigrants started one-quarter of the public companies in the United States

backed by venture capital. These companies had a market capitalization of more than $500 billion and employed 220,000 workers in the United States in 2006. The largest of these immigrant-founded firms were Intel, Solectron, Sanmina-SCI, Sun Microsystems, eBay, Yahoo!, and Google.[5]

- A 2001 study by researchers at Georgia State University and the University of Missouri-St Louis found that foreign-born scientists and engineers in the United States are "disproportionately represented" among individuals elected to the National Academy of Sciences and National Academy of Engineering, among authors of scientific papers and patents, and among founders and chairs of biotechnology companies.[6]

Immigrant scientists and engineers are not displacing native-born workers.

- The 2012 report from the Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce finds that many STEM occupations "have markedly low unemployment, and that foreign-born STEM workers currently in the workforce are complementing, not displacing their U.S. counterparts."[7]

    - There is full employment among U.S.-citizen STEM workers with advanced degrees. The federal government defines "full employment" as an unemployment rate of no more than 4 percent (to account for people who are "unemployed" because they are in the middle of changing jobs, moving, etc.). But for U.S.-citizen STEM workers with PhDs the unemployment rate is only 3.15 percent, and for those with master's degrees it is 3.4 percent.[8]

    - In some STEM occupations, the unemployment rate is even lower. Unemployment among Petroleum Engineers, for instance, is 0.1 percent, for Computer Network Architects it is 0.4 percent, and for Nuclear Engineers it is 0.5 percent.[9]

    - Those STEM fields in which large shares of workers are foreign-born have low unemployment rates among native-born workers. For example, just under one-quarter of Medical Scientists are foreign-born, but native-born Medical Scientists have an unemployment rate of just 3.4 percent.[10]

- According to a 2011 report from Georgetown University's Center on Education and the Workforce: "High and rising wage premiums are being paid to STEM workers in spite of the increasing global supply. This suggests that the demand for these workers is not being met."[11]

    - This demand is not only coming from industries that traditionally hire STEM workers, but also industries like Professional and Business Services, Healthcare Services, Advanced Manufacturing, Mining, and Utilities and Transportation. Employers in these industries are willing to pay top dollar for workers with STEM backgrounds, which has the effect of "diverting" many STEM graduates into non-traditional career paths.[12]

- Native-born workers with S&E degrees aren't being driven out of S&E occupations by immigrants; they are being lured into non-S&E occupations where their S&E skills are in high demand and command higher salaries. In other words, they face a wide range of opportunities, not a shortage of options.[13]

- Native-born STEM graduates are the most likely to be "diverted" into non-traditional career paths for a variety of economic, social, and cultural reasons. And this "diversion" of native-born STEM graduates "will continue and likely accelerate in the future." As a result, there is likely to be "an increasing reliance on foreign-born STEM talent among American employers."[14]

To create the best possible science and engineering workforce, the United States must reform both its educational and immigration systems.

- The 2012 report from the Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce notes that the unmet demand for high-tech professionals calls for an overhaul of the U.S. educational system at all levels to equip more native-born students for careers in STEM fields. But that is a long-term investment that will take many years to produce results. In the meantime, "there are talented and accomplished STEM graduates from U.S. universities who are blocked from contributing to the U.S. economy by current immigration law."[15]

- As Microsoft argues in a 2012 policy proposal, the United States needs "a two-pronged approach that will couple long-term improvements in STEM education in the United States with targeted, short-term, high-skilled immigration reforms. If done correctly, the latter can help fund the former."[16] Specifically, Microsoft calls for an increase in the number of H-1B visas and green cards available to highly skilled professionals from abroad.[17]

- A 2011 report from the U.S. Chamber of Commerce and American Council on International Personnel concludes: "Closing the door to highly educated individuals…who aid the competitiveness of U.S. companies will weaken, not strengthen, our country and will diminish the competitiveness of American employers. In the global economy, investment follows the talent and attempts to restrict the hiring of talented foreign-born professionals in the United States encourages such hiring to take place overseas, where the investment dollars will follow."[18]

Conclusion

For the sake of the U.S. economy's recovery and long-term competitiveness, lawmakers should couple new policies to improve STEM training throughout the U.S. educational system with revisions to the antiquated rules that currently govern how many and which scientists and engineers from abroad are allowed to work in the United States. Reform initiatives that address the imbalance between the demands of the U.S. economy and the archaic constraints of the U.S. immigration system are an important component of overhauling the immigration system.

Endnotes

[1] Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce, *Help Wanted: The Role of Foreign Workers in the Innovation Economy* (Washington, DC: December 2012), p. 2.
[2] Ibid., p. 3.
[3] Partnership for a New American Economy, *The "New American" Fortune 500* (New York, NY: June 2011), pp. 11, 17, 21.
[4] Vivek Wadhwa, AnnaLee Saxenian, Ben A. Rissing, and Gary Gereffi, *America's New Immigrant Entrepreneurs: Part I*, Duke Science, Technology and Innovation Paper No. 23 (Durham, NC: Duke University, January 2007).
[5] Stuart Anderson and Michaela Platzer, *American Made: The Impact of Immigrant Entrepreneurs and Professionals on U.S. Competitiveness* (Arlington, VA: National Venture Capital Association, October 2006), pp. 6-7.
[6] Paula E. Stephan and Sharon G. Levin, "Exceptional contributions to US science by the foreign-born and foreign-educated," *Population Research and Policy Review* 20, Issue 1-2, April 2001: 59-79.
[7] Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce, *Help Wanted: The Role of Foreign Workers in the Innovation Economy* (Washington, DC: December 2012), p. 3.
[8] Ibid., p. 2.
[9] Ibid.
[10] Ibid.
[11] Anthony P. Carnevale, Nicole Smith, and Michelle Melton, *STEM: Executive Summary* (Washington, DC: Center on Education and the Workforce, Georgetown University, October 2011), p. 2.
[12] Ibid., p. 3.
[13] Ibid.
[14] Ibid.
[15] Information Technology Industry Council, the Partnership for a New American Economy, and the U.S. Chamber of Commerce, *Help Wanted: The Role of Foreign Workers in the Innovation Economy* (Washington, DC: December 2012), p. 3.
[16] Microsoft, *A National Talent Strategy: Ideas For Securing U.S. Competitiveness and Economic Growth* (Redmond, WA: 2012), p. 4.
[17] Ibid., p. 23.
[18] Stuart Anderson, *Regaining America's Competitive Advantage: Making our Immigration System Work* (Washington, DC: Labor, Immigration & Employee Benefits Division of the U.S. Chamber of Commerce and the American Council on International Personnel, August 2010), p. 1.