Facts and Fallacies about High-Skilled Immigration and the American Economy

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Would expanding high-skilled immigration be helpful or harmful for America? Legislative proposals for comprehensive immigration reform have prompted debate about whether the United States needs more foreign-born workers in science, technology, engineering and math (STEM). Many opposed to increasing inflows of foreign STEM labor, as would occur through enlarging the H-1B program, argue their case on economic grounds. Here we evaluate four common and significant claims, drawing on our expansive analysis of foreign talent, the STEM labor market, and American innovation (Hanson and Slaughter, 2013).

1. Do foreign-born STEM workers add to the U.S. supply of talent?

Claims: "*H-1B and related programs are not raising U.S. levels of talent and innovation in tech fields*," (Matloff, 2013, p. 4). "*To quality for an H-1B, the foreign worker needs no special or rare skills*," (Hira, 2013, p. 5).

Facts: **Foreign-born workers make a critical contribution to the supply of STEM talent because STEM training is essential to work in STEM jobs and the foreign born are much more likely than the native born to have a STEM degree.**

- For workers in STEM occupations, 71% of those with a bachelor's, 77% of those with a master's, and 86% of those with a PhD have their degree in a STEM field.

Clearly, STEM training matters for getting a STEM job. And immigrant workers (particularly those arriving in America at college age or later) are much more likely to have that training.

- For bachelor's degree holders, 35% of the foreign born have a degree in a STEM field, compared to just 19% of the U.S. born; for master's degree holders, the difference is even more striking, with 54% of the foreign born versus 20% of the U.S. born having a STEM degree; and for PhDs the difference is larger still with 70% of the foreign born versus 42% of the U.S. born having a STEM degree.

Explanation: Our data are from the 2009-2011 American Community Surveys, which provide the most detailed information available on occupation and degree field for a large and representative sample of U.S. workers. Other studies (e.g., Matloff, 2013) use data that are *not* representative of the overall U.S. labor force: data that exclude foreign-born workers who obtained their degrees abroad, and/or data that suffer from relative small sample sizes. A further important feature of our analysis, on which we elaborate below, is that we define STEM occupations to be those that primarily employ workers with more than a high school education (which other studies often fail to do).

2. Do foreign-born STEM workers undercut the wages of Americans?

Claims: "*The H-1Bs are underpaid relative to Americans of comparable education,*" "*former foreign students appear to be less talented on average, as indicated by their lower wages than the Americans,*" (Matloff, 2013, pp. 7 and 9). "*The aggregate data for computing professionals indicate that paying H-1Bs below market wages is quite common,*" (Hira, 2010, p. 10). "*H-1B workers are paid lower wages than their American counterparts,*" (FAIR, 2008).

Facts: **Comparing U.S.-born and foreign-born workers in STEM jobs with the same education and years of experience reveals that their wages are substantially the same**.

- Either across the broader STEM labor market or within individual STEM occupations, including computer programmers and software developers, there is no statistical difference between the earnings of immigrant and native-born labor.

Explanation: Our results are based on analysis of the most comprehensive available data on the U.S. labor market: the most recent American Community Surveys and Current Population Surveys. We use these two data sets to measure average weekly wage and salary income (including overtime and bonuses) of full-time, prime-age (25 to 54 year old) workers in STEM occupations. We define foreign-born workers to be those who arrived in the United States at age 18 or older to capture those likely to have entered the country on student or H-1B visas. Studies claiming to find that foreign-born STEM workers are paid less than their American coworkers have used data that are not representative of the entire U.S. labor market (e.g., Matloff (2013) uses the National Survey of College Graduates, which covers only workers who have obtained degrees from American universities).

3. If demand for STEM labor is strong, why aren't wages rising?

Claims: "*The key indicator of a shortage would be rapidly rising wages, but wages in STEM and in computer occupations have been essentially flat for more than a decade,*" (Hira, 2013, p. 5). "*Wage suppression is already occurring in computer and mathematical occupations,*" (Costa, 2012, p. 8).

Facts: **Wages for STEM occupations are rising *relative to other occupations***.

- Data on median hourly earnings from the Bureau of Labor Statistics show that for engineers wages have risen by 7% relative to all other occupations since 2003 and by 3% since 2008 and that for computer and mathematical occupations wages have risen relative to other occupations by 3% since 2003 and by 1% since 2010.

When comparing workers at the same age and education level there is a remarkably persistent wage premium for STEM labor of 25% that has remained stable over the last three decades.

- The STEM wage premium indicates the substantial value that the U.S. labor market places on STEM skills. This premium has not eroded in 30 years, despite a 20% increase in the supply of STEM labor (relative to non-STEM labor) since the early 1980s.

Explanation: While it is true that wages adjusted for inflation have remained flat for many occupations, such wage levels are a noisy indicator of labor demand. Many factors buffet wages and average prices (used to control for inflation), making it difficult to extract information about changes in labor demand or labor supply from the average wage. The long-standing standard practice in peer-reviewed labor economics is to analyze wages and employment for one occupation *relative to other occupations*, because relative comparisons help neutralize confounding factors that affect all worker types (such as changes in monetary policy). Both relative wages and relative employment have long been rising for STEM occupations, consistent with rising relative labor demand.

4. Would expanding high-skilled immigration increase unemployment?

Claims: "*The unemployment rate for computer-related occupations still remains much higher than it would be under full employment*," (Costa, 2012, p. 9). "*Employment and wages in IT jobs have been weak, trends that are not consistent with strong demand*," (Salzman, Kuehn, and Lowell, 2013, p. 2).

Facts: **In STEM occupations, unemployment is falling sharply, consistent with substantial labor-market tightening. The STEM unemployment rate has already or will soon fall below its long-run average.**

- Data from the Current Population Survey show that the unemployment rate for STEM occupations fell from 4.5% in 2009 to 2.5% in 2012, barely above its 20-year average of 2.45%. In computer occupations (software developers, computer scientists, computer systems analysts), the unemployment rate has declined even more dramatically—from 5.4% in 2009 to 2.5% in 2012—and is now below its 20-year average of 2.8%.

Explanation: Commonly used definitions of STEM occupations (e.g., Costa, 2012) inappropriately mix high-skill and low-skill jobs. We define STEM jobs to exclude occupations that contain a substantial number of workers with no more than a high school education (e.g., computer support staff, drafters, and technicians of various types). The remaining STEM occupations include engineers, high skill computer occupations, mathematicians, life scientists, and physical scientists. We further focus on prime age working adults (age 25 to 54) to exclude individuals undergoing transitions in or out of the labor force. Focusing on prime-age, high-skill workers delivers clear evidence of labor-market tightening in STEM fields.

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