Yes, We Have a Need for More STEM, Part 1

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It appears that Congress may actually take up the issue of immigration reform and with it the issue of high-skill immigration. And toward that end Senators Hatch (R-UT), Klobuchar (D-MN), Rubio (R-FL) and Coons (D-DE) have taken the lead on the Immigration Innovation Act of 2013 (known as I-squared), which would make it easier for foreign science, technology, engineering and math (STEM) students and workers to come and stay in America, while at the same time raising increased funds from the U.S. high-tech industry to support programs to help train Americans in STEM skills.

And not surprisingly, this common-sense and needed legislative proposal has provoked the usual opposition from some on the left. Take Ross Eisenbrey's recent *New York Times* op-ed, "America's Genius Glut." [1] Eisenbrey, of the liberal Economic Policy Institute, argues that I-squared is not needed, because, he claims:

1. America's technology leadership is not endangered;
2. We aren't turning away foreign students, or forcing them to leave once they've graduated; and
3. There is no labor shortage in high-tech occupations.

Let me address these fallacies of each of these arguments.

America's Technology Leadership Is Not Only Endangered — It's Been Lost

If America is doing great at innovation, then why liberalize high-skill immigration

policies, or for that matter, expand programs to get more Americans into STEM jobs? To make this case, Eisenbrey cites Harvard economist Richard B. Freeman, who shows that "with just 5 percent of the world's population, [the U.S.] employs a third of its high-tech researchers, accounts for 40 percent of its research and development, and publishes over a third of its science and engineering articles. And a marked new crop of billion-dollar high-tech companies has sprung up in Silicon Valley recently, without the help of an expanded guest-worker program."

While this is true, it misses the point that America used to be responsible for much higher numbers on all of these indicators. As we argue in our recent Yale University Press book, Innovation Economics: The Race for Global Advantage [2], while other nations were now setting their sights on winning the race for global innovation advantage, America was asleep, convinced of its own innate economic superiority, and like Eisenbrey, convinced that it needed to do little to win the race.

In 2011, the Information Technology and Innovation Foundation (ITIF) released a report, The Atlantic Century II, which benchmarked 44 nations and regions on 16 core indicators of innovation-based capacity. When assessing rates of change in innovation capacity during 2000 to 2009 (that is, the rate of improvement on these 16 indicators), the United States ranked second to last, ahead of only Italy. In other words, 42 nations or regions made faster progress than the United States did at bolstering their innovation competitiveness. In fact, the United States placed near the bottom for rates of change at enhancing its levels of higher-education attainment, number of scientific researchers per capita, and number of scientific publications per capita, while also scoring poorly at increasing its levels of R&D. And one reason, as George Mason's David Hart has written [3], is because many other nations have liberalized their high-skill, STEM-focused immigration policies.

And with respect to the billion-dollar, high-tech companies in the Valley, the American innovation economy is more than the Valley. Moreover, most of these firms were in a narrow arrow of Internet-based companies that, while innovative, are not enough to power the jobs and innovation needed in the United States. This is one reason America is running a trade deficit in high-technology goods of over $100 billion.

We Aren't Recruiting & Retaining Enough Foreign STEM Workers

Even if we are losing the innovation race, Eisenbrey argues it's not because of lack of foreign talent: "Nor are we turning away foreign students, or forcing them to leave once they've graduated. According to the Congressional Research Service, the number of full-time foreign graduate students in science, engineering and health fields has grown by more than 50 percent, from 91,150 in 1990 to 148,900 in 2009. And over the 2000s, the United States granted permanent residence to almost 300,000 high-tech workers, in addition to granting temporary work permits (for up to six years) to hundreds of thousands more."

But first, this misses the major point. Yes, foreign graduate STEM enrollment has grown. But few advocates of high-skill, STEM immigration would argue that the problem is not one of foreign students not being admitted to America to go to

university. The problem is that it is difficult for them to stay.

Moreover, we may not be able to rely on high-skill foreign STEM talent too much longer. Anna Lee Saxenian has documented this, showing that as Taiwan's economy (and universities) developed, Taiwanese STEM students getting degrees in the United States were much more likely to return home to Taiwan. And as nations like India and China develop, it is certainly possible that fewer of their top students will come to the United States for STEM degrees, and likewise that fewer will stay.

The Chinese government is certainly aware of this, and it is one reason why it is making a major push to develop a considerable number of new research universities. The Chinese have constructed campuses and science parks to accommodate what it hopes will be a boom in homegrown technological advances. This is part of China's ambitious "Thousand Talents" program, which seeks to lure Chinese-born scientists and engineers in the United States.

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