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The United States has long served as a magnet for talented scientists, engineers and mathematicians from China and India. This attraction has proven controversial, both in Asia and in the United States. Economic nationalists in China and India have long complained that the "brain drain" damaged their countries' ability to compete and slowed economic development by skimming off the best talent. For their part, critics in the United States claimed that foreign workers arriving on H-1B visas displaced U.S. knowledge workers and pushed down wages for this class of employment.

In the past five years, however, the pull of the United States has clearly lessened as the entry barriers for immigrants have become more formidable and as rapid economic development in India and China now provides enhanced professional and entrepreneurial opportunities plus a better quality of life than was previously possible in those countries. More recently, long waits for permanent or extended work visas have discouraged hundreds of thousands of immigrants. And the ongoing financial crisis in the United States has caused a xenophobic backlash, including legal steps taken by the U.S. Congress to limit the award of temporary H-1B visas by U.S. financial corporations receiving bailout funds.

These changes have made life in China and India far more attractive choices for residency. This has resulted in a new demographic trend -- a "reverse brain drain" as thousands of Chinese and Indians who were studying in, or working and living in the United States on a permanent basis, have returned to their Asian homelands or other parts of Asia. To date, the evidence is largely anecdotal. No official statistics on reverse immigration yet exist. However, the topic has become a constant theme in immigrant communities in the United States and abroad. What's more, the trend has potentially profound implications for the global economic balance of power and it could augment technological upgrading in Asia while slowing technology development in the United States.

Some new research has begun to illuminate the decision-making processes behind this reverse brain-drain with evidence on the feelings and beliefs of the Chinese and Indian immigrants and students who make up this trend cohort. A research team including Vivek Wadhwa and Gary Gereffi of Duke University, AnnaLee Saxenian of University of California at Berkeley, Richard Freeman of Harvard University, Guillermina Jasso of New York University and Ben Rissing of the Massachusetts Institute of Technology spent three years conducting multiple surveys of thousands of technology and engineering startup companies. The team interviewed hundreds of company founders, surveyed more than 1,000 foreign students and more than 1,000 returnees, and made multiple trips to India and China to understand the on-the-ground situations in those countries.

This research built on AnnaLee Saxenian's

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1999 report *Silicon Valley's New Immigrant Entrepreneurs*. [1] This was the first broad assessment of the critical role that immigrants played in Silicon Valley's regional economy. Saxenian found that Chinese and Indian engineers were represented on the founding teams of 24% of Silicon Valley technology businesses launched between 1980 and 1998. [2] Subsequent research conducted by our team undertook an expanded nationwide survey of 2,054 randomly selected engineering and technology firms founded between 1995 and 2005. In one-quarter of those companies, the chief executive officer or chief technology officer was foreign born. Assuming this data is broadly representative nationwide, in 2005 immigrant-founded tech companies generated $52 billion in revenue nationwide and employed 450,000 workers. [3]

The research team also examined the World Intellectual Property Organization (WIPO) Patent Cooperation Treaty (PCT) records. They found that foreign nationals residing in the United States were named as inventors or co-inventors in one quarter of WIPO patent applications filed from the United States in 2006, up from the 7.6% of applications filed in 1998. These applications represented a significant share of intellectual activity at many prominent U.S. companies. Immigrant patent filings accounted for 72% of the total at Qualcomm, 65% at Merck, 64% at General Electric, and 60% at Cisco Systems. Clearly, immigrants were and are contributing significantly to U.S. intellectual property, a key ingredient for the country's economic success. [4]

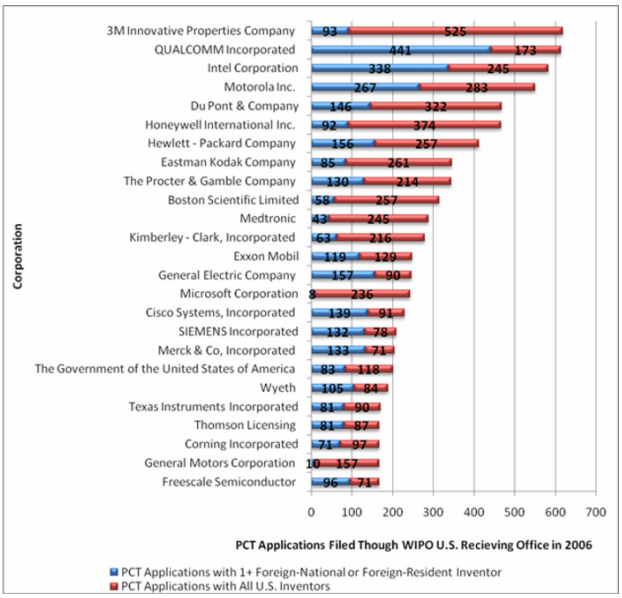


Chart 1. 2006 U.S. International Patent Applications by Corporations

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To explore the reasons why these immigrants might be leaving, the team located via the online social network LinkedIn 1,203 highly skilled Indian and Chinese technology specialists and professionals who

had worked or received education in the United States and subsequently returned to their home country. [5] Although this method of identifying returnees did not produce a rigorously scientific sample, they are representative of an important group of technologically proficient young professionals. The average age of the respondents was in the low 30s, and more than 85% had advanced degrees.

Among the strongest factors cited by these immigrants as a reason for going to the United States were professional and educational development opportunities. Ironically, their move home also served, on average, as a career catalyst. Respondents reported that they have

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moved up the organization chart by returning home. Only 10% of the Indian returnees held senior management positions in the United States, but 44% found jobs at this level in India. Chinese returnees went from 9% in senior management in the United States to 36% in China. Opportunities for professional advancement were considered to be better at home than in the United States by 61% of Indians and 70% of Chinese. These groups also felt that opportunities to start a business were significantly better in their home countries.

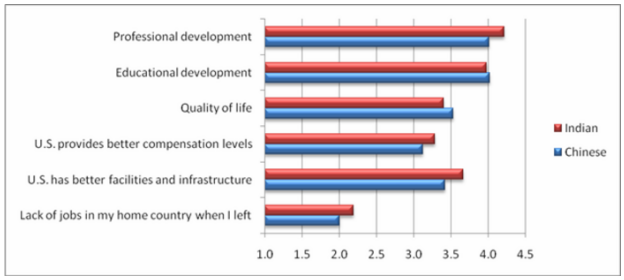


Chart 2. Returnees: Factors Contributing to Decision to Migrate to U.S. (Average rankings)
(1 = not important, 5 = extremely important)

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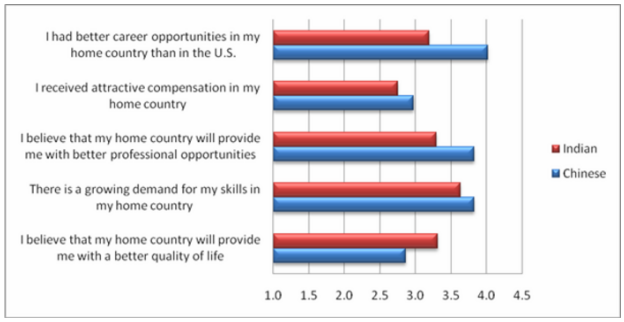


Chart 3. Returnees: Reasons for Returning to Home Country (Average rankings)
(1 = not important, 5 = extremely important)

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Surprisingly, visa status was not the most important factor determining their decision to return home. Three of four indicated that considerations regarding their visa or residency permit status did not contribute to their decision to return to their home country. In fact, 27% of Indian respondents and 34% of Chinese held permanent resident status or were U.S. citizens. However, respondents overwhelmingly favored their home location with regard to social situations, such as closeness to friends and ability to care for aging parents.

The rationale for returnees moving home was echoed by responses of surveyed foreign nationals currently enrolled in U.S. universities. These groups have traditionally represented a disproportionate percentage per capita of advanced degree students. During the 2004–2005 academic year, roughly 60% of engineering Ph.D. students and 40% of Master's students were foreign nationals, and foreign nationals make up a significant share of the U.S. graduate student population in all STEM disciplines.

In the past, the overwhelming majority of these students worked in the United States after graduation. The five-year stay rate for Chinese Ph.D.s was 92% and for Indians 85%. A significant percentage chose to remain permanently. The research team used the social networking site Facebook to recruit 1,224 foreign nationals who are currently studying at U.S. universities or who graduated in 2008. The respondents included 229 students from China and Hong Kong, 117 from Western Europe, and 878 from India. Again, this is not a rigorously scientific sample, but

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the group is large and random enough to make the results worth considering.

The overall consensus among respondents was that the United States was no longer the destination of choice for professional careers. Most students in the sample wanted to stay in the United States, but only for short periods. Among respondents 58% of Indian, 54% of Chinese, and 40% of European students said that they would stay in the United States for at least a few years after graduation if given the chance. However, only 6% of Indian, 10% of Chinese, and 15% of European students said they want to stay permanently. The largest group of respondents— 55% of Indian, 40% of Chinese, and 30% of European students—wants to return home within five years. [6] This is a fairly short tenure considering that the average founding technology entrepreneur from China or India lived in the United States an average of 14 years before launching a company in the United States.

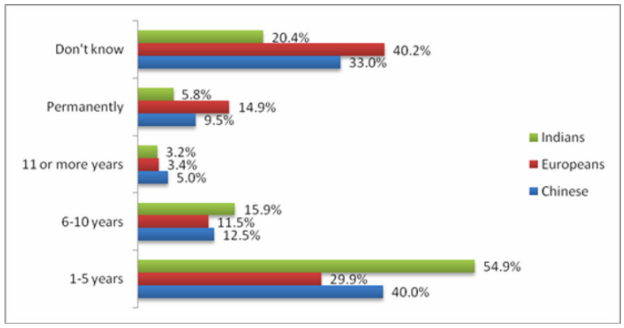


Chart 4. Foreign National Students: How Many Years Would You Like to Stay in U.S. Post Graduation?

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Visa concerns were more evident among students. More than three-fourths of these students express concern about obtaining work visas, and close to that number worry that they will not be able to find U.S. jobs in their field. Most said they found a warm reception here from the American people. But their concern over work visas could only have been exacerbated by the ongoing attempts to curtail work possibilities for foreign nationals in the United States. Further, the students' assessment of their individual opportunities mirrored their view for the future of the U.S. economy. The survey found that only 7% of Chinese students, 9% of European students, and 25% of Indian students believe that the best days of the U.S. economy lie ahead. Conversely, 74% of Chinese students and 86% of Indian students believe that the best days for their home country's economy lie ahead.

The impact of a reverse brain drain could potentially be profound and long lasting. Emerging research highlights the substantial contributions made by foreign nationals to the U.S. economy and undercuts contentions that foreign students may be "crowding out" Americans in science and engineering and leading them to pursue careers in professions like medicine or law. A paper by William R. Kerr of Harvard Business School and William F. Lincoln of the University of Michigan ("The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention"), [7] found that holders of H-1B visas add significantly to U.S. innovation. They do so by both contributing their own patents and by increasing overall patent activity by workers who are U.S. citizens.

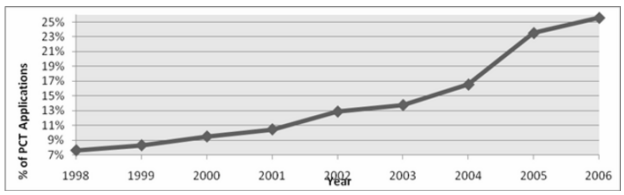


Chart 5. Foreign-National Contribution to U.S. Global Patent Applications from 1998 to 2006

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Jennifer Hunt of McGill University and Marjolaine Gauthier-Loiselle of Princeton University analyzed long-term changes in a paper published in January, 2009 titled "How Much Does Immigration Boost Innovation?" [8] They calculate that, for every percentage point rise in the share of immigrant college graduates in the U.S. population, the total per capita number of patents for the entire population should increase by an astonishing 6%. Immigrants raise per capita patents because they patent at twice the native rate, due to their heavy concentration in science and engineering. Equally important, Hunt and Gauthier-Loiselle found that natives are not crowded out by immigrants, and that "immigrants do have positive spillovers, resulting in an increase in patents per capita of 9%-18% in response to a one-percentage-point increase in immigrant college graduates." If we accept the lower bound of this estimate (9%) as correct, and 6% of this is due to the higher patent rate for immigrants cited above, then 3% is the positive spillover effect, which "comes from the skills of immigrants making others more inventive, either by working with or for other people, or more indirectly, by getting patents which others can examine and use as a source of inspiration, or by just increasing the science and engineering population enough that there is a critical mass of people to begin investigating new areas" (personal e-mail communication with the study's co-author, Jennifer Hunt, March 30, 2009).

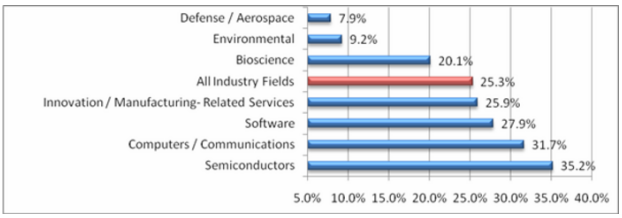


Chart 6. Percentage of Immigrant-Founded Companies by Industry

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These positive impacts created by talented immigrant workers will be located wherever those workers live. So losing these talented workers will likely result in an overall reduction of patents and innovation in the United States and a corresponding rise of these types of activities in India and China. In a world where knowledge is the foundation of economic power, brains are the coin of the realm. Dramatic changes in visa policies or political unrest in China or India could quickly reverse the tide. The majority of immigrant returnees to China and India stated they might be willing to return to the United States if offered equal opportunities and permanent residency. [9] That said, relocating from one country to another is no trivial act.

Return migration from the United States to China and India is not necessarily a net loss to the U.S. economy. It is quite possible that many who return to Asia maintain strong ties to the United States and even establish cross-border entrepreneurial networks that provide economic benefits to both societies. This is a topic that merits further investigation. Nonetheless, the ongoing return migration will, at a minimum, seed the economies of India and China with considerable talent in the near term and possibly help tilt-the balance of economic power over the long-term by enhancing the innovation quotient of India and China. This is likely to lessen the relative competitiveness of the United States, a result of the constant competition for the best brains on Earth.

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Notes

[1] Saxenian, AnnaLee. (1999). Silicon Valley's New Immigrant Entrepreneurs. San Francisco: Public Policy Institute of California

[2] Saxenian, AnnaLee, Yasuyuki Motoyama, and Xiaohong Quan. (2002). Local and Global Networks of Immigrant Professionals in Silicon Valley. San Francisco: Public Policy Institute of California.

[3] Wadhwa, Vivek, Ben Rissing, AnnaLee Saxenian, and Gary Gereffi. (2007). Education, Entrepreneurship and Immigration: America's New Immigrant Entrepreneurs, Part II (June 11). Available here.

[4] Wadhwa, Vivek. (2009). Reverse Brain Drain, Issues in Science and Technology, Spring. Available here.

[5] Wadhwa, Vivek, AnnaLee Saxenian, Richard B Freeman, and Gary Gereffi. (2009). America's Loss is the World's Gain: America's New Immigrant Entrepreneurs, Part IV (March 2). Available here.

[6] Wadhwa, Vivek, AnnaLee Saxenian, Richard B Freeman, and Alex Salkever. (2009). Losing the World's Best and Brightest: America's New Immigrant Entrepreneurs, Part V (March 19). Available here.

[7] Kerr, William R. and William Fabius Lincoln. (2008). The Supply Side of Innovation: H-1B Visa Reforms and US Ethnic Invention. Harvard Business School Entrepreneurial Management Working Paper No. 09-005. Available here.

[8] Hunt, Jennifer and Gauthier-Loiselle, Marjolaine, How Much Does Immigration Boost Innovation?. IZA Discussion Paper No. 3921. Available here.

[9] Wadhwa, Saxenian, Freeman, and Gereffi (2009), America's Loss is the World's Gain: Ibid.

https://doi.org/10.1017/S1557466009023663 Published online by Cambridge University Press