The Reverse Brain Drain

Low visa quotas and delays may be sending highly skilled and entrepreneurial immigrants back home—to work for U.S. competitors

by Vivek Wadhwa

For the first time in its history, the U.S. faces the prospect of a reverse brain drain. New research by my team at the Pratt School of Engineering at Duke University shows that more than 1 million highly skilled professionals such as engineers, scientists, doctors, researchers, and their families are in line for a yearly allotment of only around 120,000 permanent-resident visas for employment-based principals and their families in the three main employment visa categories (EB-1, EB-2, and EB-3). These individuals entered the country legally to study or to work. They contributed to U.S. economic growth and global competitiveness. Now we've set the stage for them to return to countries such as India and China, where the economies are booming and their skills are in great demand. U.S. businesses large and small stand to lose critical talent, and workers who have gained valuable experience and knowledge of American industry may become potential competitors.

The problem is simple. There aren't enough permanent-resident visas available each year for skilled workers and their families. And there is a limit of fewer than 10,000 visas that can be issued to immigrants from any single country. So countries with the largest populations such as India and China are allocated the same number of visas as Iceland and Mongolia.

Visa Delays Deprive U.S. of Talent

The result is that wait times for employment visas currently stretch from four to six years for immigrants from countries such as India and China, and all indications are that these delays will get longer. Based on a 2003 study of new legal immigrants to the U.S. called the New Immigrant Survey, we estimate that in 2003, about 1 in 3 professionals who had been through the immigration process either planned to leave the U.S. or were uncertain about remaining. Media reports and other anecdotal evidence indicate that many skilled workers have indeed begun to return home.

Much of the current public debate on immigration centers on concerns over low-skilled immigrants entering the U.S. illegally. We do need to develop fair policies to deal with this problem. But skilled immigrants who enter the U.S. legally are a different issue. Professor Richard Devon of Pennsylvania State University estimates that in the U.S. about $200,000 is

invested in a child by the time they gain a bachelor's degree in engineering. That means that the U.S. gains billions of dollars in benefit from educated professionals who leave other countries to come here. And we lose billions when they return home. Additionally, we end up training highly skilled workers in our markets, technology, and way of doing business.

Consider this: Earlier research by my team found that more than half of the engineering and technology companies started in Silicon Valley and a quarter of those started nationwide from 1995 to 2006 had immigrant founders. These companies employed 450,000 workers and generated $52 billion in revenue in 2006. Their founders tended to be very highly educated in science, technology, math, and engineering-related disciplines, with 96% of them holding bachelor's degrees and 75% holding master's degrees or PhDs (see BusinessWeek.com, 6/11/07, "Immigrants: Key U.S. Business Founders").

Patents: Evidence of Entrepreneurial Activity

We also uncovered some puzzling data on patent filings. When we analyzed the international patent database maintained by the World Intellectual Property Organization (WIPO), we found that 1 in every 4 patent applications from the U.S. in 2006 listed a foreign national residing in the U.S. as an inventor. This number had increased threefold over an eight-year period and didn't take into account inventors who had become U.S. citizens before applying for a patent.

We realized that these foreign-national inventors were not likely to be from the same immigrant group that was founding high-tech companies. They were likely to be PhD students and employees of U.S. corporations who are in the U.S. on temporary visas. Temporary-visa holders can't easily start their own companies—their visas require them to work full time for the company that sponsored them.

For our new research, we reanalyzed the WIPO patent database to look at which immigrant groups and corporations were applying for the most patents. To understand the foreign-national data, we examined extensive information published by the Homeland Security Dept., the Labor Dept., and the State Dept. We also reviewed the New Immigrant Survey to gain insight into the immigration process and to examine the potential that, even after becoming permanent residents, skilled immigrants might return home.

Here is what we found:

• Foreign nationals contributed to more than half of the international patents filed by companies such as Qualcomm (QCOM) (72%), Merck (MRK) (65%), General Electric (GE) (64%), Siemens (SI) (63%), and Cisco (CSCO) (60%). Their contributions were relatively small at Microsoft (MSFT) (3%) and General Motors (GM) (6%). Surprisingly, 41% of the patents filed by the U.S. government had foreign nationals listed as inventors.

• Foreign nationals contributed to 25.6% of all U.S. international patent applications in 2006, but the numbers were much higher in several states such as New Jersey (37%), California (36%), and Massachusetts (32%).

• In 2006, 16.8% of international patent applications from the U.S. had inventors with Chinese names and 36% of these (or 5.5% of the total) were foreign nationals. Similarly, 13.7% had Indian names and 40% (or 6.2% of the total) were foreign nationals.

• Both Indian and Chinese inventors tended to file most patents in the fields of medicine, pharmaceuticals, semiconductors, and electronics.

Our analysis of the immigration data produced the most startling results.

"Immigration Limbo"

We estimate that, as of Sept. 30, 2006, there were 500,040 individuals in the main employment-based visa categories and an additional 555,044 family members in line for permanent-resident status in the U.S. An additional 126,421 with job offers were waiting abroad. In total, there were 1,181,505 educated and skilled professionals waiting to gain legal permanent-resident status.

In the 2005-06 academic year, there were 259,717 international students in the U.S. There were an additional 38,096 in practical training—many of these are PhD researchers.

One thing is certain: If we wait five years to fix immigration policy, the unskilled workers will still be here, but the skilled workers who are in "immigration limbo" will be long gone. Our loss will be the gain of countries we are increasingly competing with in the new global landscape.

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