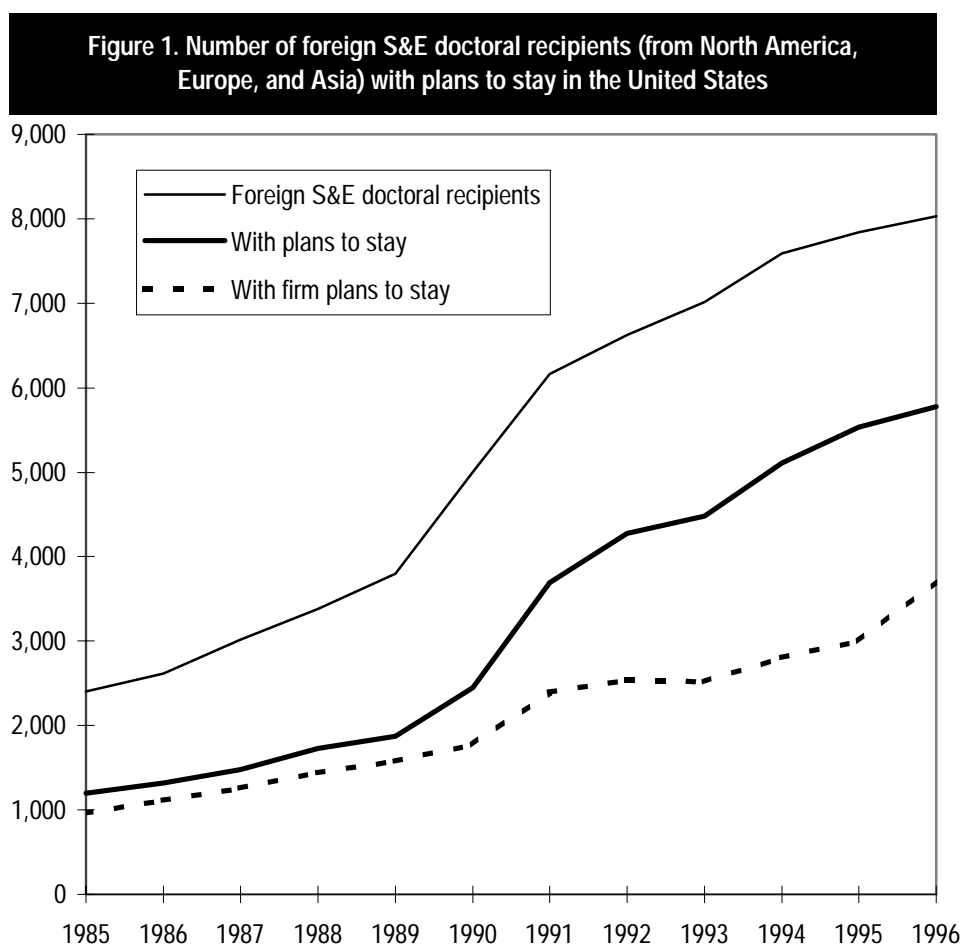


FOREIGN DOCTORAL RECIPIENTS WITH PLANS TO STAY IN THE UNITED STATES

In the last decade, the number of students from countries of Europe, Asia, and North America earning S&E doctoral degrees at U.S. institutions has been increasing faster than the overall number of S&E doctoral degrees awarded by U.S. institutions. The number of S&E doctoral degrees earned in the United States by students from these regions increased from 2,400 in 1985 to over 8,000 in 1996, an average annual growth rate of 11.6 percent. During the same period, the total number of S&E doctoral degrees earned in

the United States increased from 18,000 to 27,000, representing an annual increase of 3.4 percent³ (table A-1). Paralleling the increase in the number of S&E doctoral recipients from these three regions is an increase in those who plan to remain in the United States after receiving their degrees (figure 1).

Between 1988–96, students from the major countries of Asia, Europe, and North America earned more than 55,000 S&E doctoral degrees at U.S. institutions. During



NOTE: See appendix table A-2 for countries included within each region.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Survey of Earned Doctorates*, special tabulations, and table A-1.

³ The average annual increase in the number of degrees awarded to U.S. citizens was 1.8 percent. See *Science and Engineering Doctorate Awards: 1996*, Detailed Statistical Tables, NSF 97-329 (Arlington, VA, 1997).

this period, 63 percent of these 55,000 doctoral recipients planned to remain in the United States after completing their studies and 37 percent planned to locate outside the United States. About 39 percent of foreign doctoral recipients had firm plans to remain in the United States (table 1). To be counted as having “firm plans” to remain, the respondent had to give the name and address of his or her prospective employer.

The number of foreign doctoral recipients from Asia is five times higher than the number from Europe. In addition, students from the Asian region have a higher planned stay rate than those from Europe and North America. Plans to stay in the United States, however, differ widely by country.

ASIA

High stay rates in the United States are largely attributable to more favorable opportunities for employment or further study in the United States than in countries of origin. Between 1988–96, a large majority

of doctoral recipients from China and India planned to remain in the United States for further study and employment. During this period, about 80 percent of the approximately 25,000 Indian and Chinese S&E doctoral recipients planned to remain in the United States, and about half reported accepting firm offers to do so (figure 2 and table A-2). The high stay rate of Chinese students is largely attributable to the enactment (after the student demonstrations in Tiananmen Square) of the Chinese Student Protection Act of 1992, granting permanent U.S. residence status to most of the students.

In contrast to the high stay rates for Indian and Chinese doctoral students, only 23 percent of doctoral recipients from South Korea and 28 percent from Taiwan reported accepting firm offers to remain in the United States (table A-2).

Planned stay rates for the whole period 1988–96, however, mask differences over time for several countries. The trend in the 1990s has been for fewer doctoral recipients from South Korea and Taiwan to

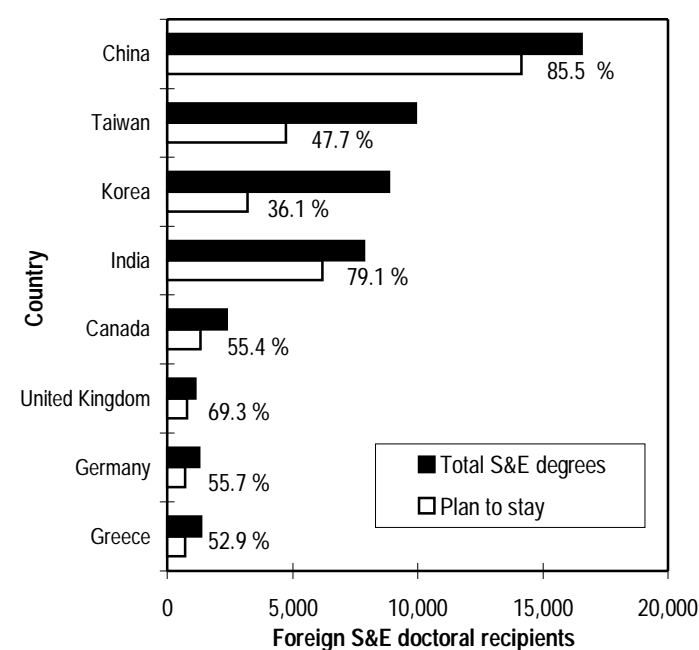
Table 1. Number and percent of foreign S&E doctoral recipients with plans to stay in the United States, by selected region: 1988–96

| | Foreign S&E doctoral recipients | | | | |
|----------------------------------|---------------------------------|--------------------|-------------|-------------------------|-------------|
| | Total | With plans to stay | Percent | With firm plans to stay | Percent |
| Regions¹ | 55,444 | 34,917 | 63.0 | 21,779 | 39.3 |
| Asia..... | 43,171 | 28,280 | 65.5 | 16,964 | 39.3 |
| Europe..... | 8,760 | 4,898 | 55.9 | 3,521 | 40.2 |
| North America..... | 3,513 | 1,739 | 49.5 | 1,294 | 36.8 |

¹See table A-1 for countries within each region.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Survey of Earned Doctorates*, special tabulations, and table A-1.

Figure 2. Number and percent of foreign S&E doctoral recipients with plans to stay in the U. S., by country of origin



SOURCE: National Science Foundation, Division of Science Resources Studies, *Survey of Earned Doctorates*, special tabulations, and table A-2.

remain in the United States because of improved employment opportunities in their home countries. This is particularly true of South Korean engineering doctoral recipients.⁴ However, these trends could change because of deteriorating financial conditions in Asia in 1998. For other countries, notably China, the number of doctoral recipients with firm plans to stay has increased in the 1990s (figure 3).

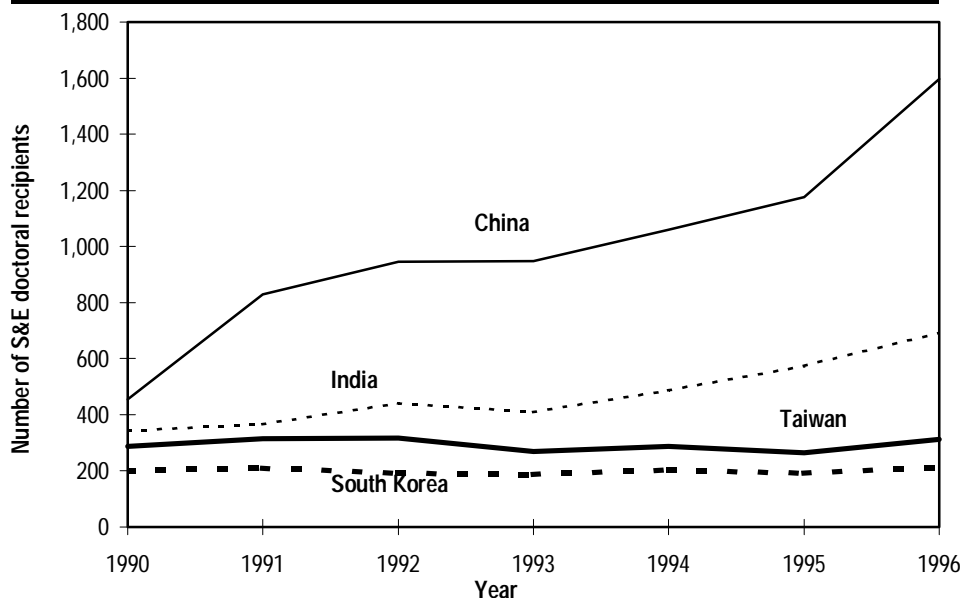
Before 1988, about half of the foreign students who earned S&E doctoral degrees at U.S. universities planned to locate in the United States after completing their degrees. In the 1990s, however, the proportion with plans to remain in the United States increased to more than 60 percent.⁵ Although the increase in the stay rate of Chinese students is largely responsible for the jump in the overall rate of those planning to stay, students from other countries are also contributing to the growing number of those who plan to stay. Undoubtedly, the increase—particularly after 1993—is a reflection of rising employment opportunities made possible by a strong U.S. economy (figure 4).

Information on initial plans to stay in the United States (collected by the SED at the time of graduation) is corroborated by the findings of a recent study of foreign doctoral recipients working and earning wages in the United States.⁶ According to this study, the majority of 1990–91 doctoral recipients from India (79 percent) and China (88 percent) were still working in the United States in 1995. In contrast, only 11 percent of South Koreans who earned S&E doctorates from U.S. universities in 1990–91 were working in the United States in 1995.

EUROPE

The number of European students who completed U.S. doctoral programs between 1988 and 1996 (8,700) is small compared to the number of Asian students who completed U.S. doctoral programs during the same time frame (43,171), even when all Western and Eastern European countries are combined and compared to only four Asian countries. Recently, however, more European students have been taking

Figure 3. Number of U.S. S&E doctoral recipients from selected Asian countries with firm plans to remain in the United States: 1990–96



SOURCE: National Science Foundation, Division of Science Resources Studies, *Survey of Earned Doctorates*, special tabulations, and table A-3.

⁴ National Science Board, “Higher Education in Science and Engineering,” *Science & Engineering Indicators–1998*. Arlington, VA: National Science Foundation, 1998 (NSB98-1).

⁵ *Ibid.*

⁶ M.G. Finn, “Stay Rates of Foreign Doctorate Recipients from U.S. Universities: 1995,” Oak Ridge, TN: Oak Ridge Institute for Science and Education, 1997.

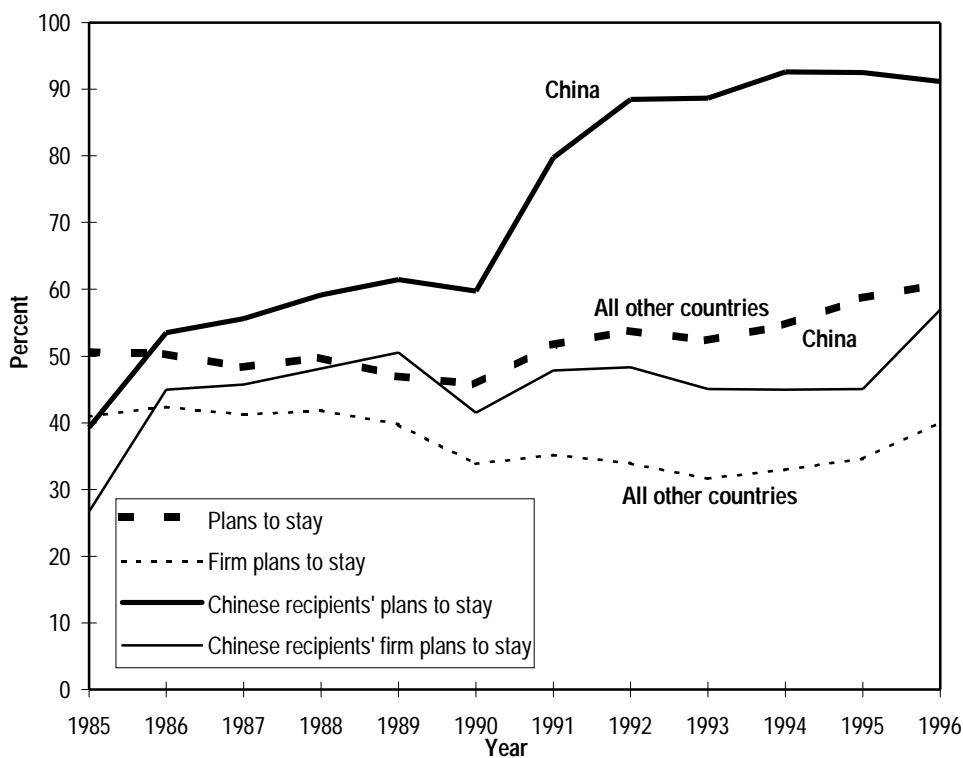
doctoral training at U.S. universities, and a larger proportion of these students is planning to remain in the United States. The United Kingdom and Greece traditionally have been the major countries of origin of European doctoral students in the United States. In recent years, Germany has joined this group.

Relatively few French or Italian students come to the United States for doctoral training compared to the number from other European countries, and relatively few of those plan to remain after completing their degrees (table A-2). However, new Ph.D.s from France have come to the United States temporarily for postdoctoral appointments. In 1995, there were twice as many French postdoctorates (271) as there were French doctoral students (132) in the United States.⁷

NORTH AMERICA

Within North America, Canada has sent far more S&E doctoral students to U.S. universities than did Mexico. In addition, the number of Canadian students who have earned S&E doctoral degrees in the United States—although smaller than the number from individual Asian countries—is higher than the number from individual European countries. More than half of these doctoral recipients planned to locate in the United States, and 43 percent reported firm offers for further study or work in the United States. Mexico sent relatively few students to U.S. doctoral programs, and a relatively small percentage (similar to that of South Korea) planned to stay in the United States (table A-2).

Figure 4. Percent of U.S. S&E doctoral recipients from China and all other countries with plans to stay in the United States: 1985–96



SOURCE: National Science Foundation, Division of Science Resources Studies, *Survey of Earned Doctorates*, special tabulations, and table A-4.

⁷ See Damien Terouanne, “*Presence Francaise en Science et en Ingenierie Aux Etats-Unis: Cerveaux en fuite ou en voyage?*”, a joint project between NSF and the French National Committee for Scientific Research (known by its French abbreviation, CNRS), published by CNRS Washington, 1997.