



Institute for the Study of International Migration
Georgetown University

FACT BRIEF

REASON FOR CONCERN? TRENDS IN THE NUMBERS OF FOREIGN STUDENTS IN SCIENCE AND ENGINEERING THROUGH 2005

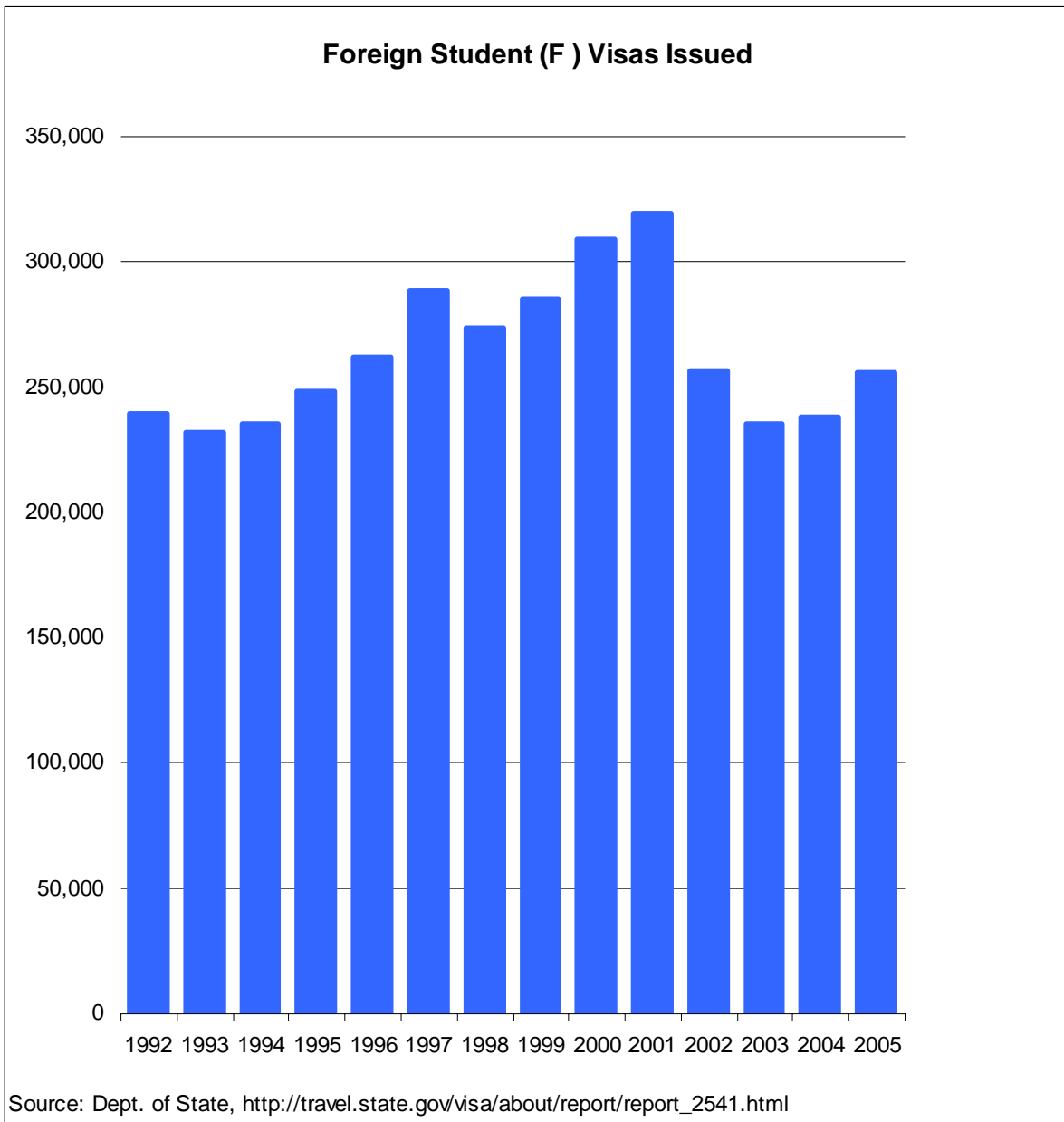
The number of foreign students admitted to the United States decreased after 2001 after a long run up particularly during the 1990s. The reasons for the decrease appear to be due in part to increased security measures following 9/11 which made temporary visas more time consuming and sometimes more difficult to get. The 2001 recession also played a role. Some students decided not to apply for studies in the United States to avoid those hassles or to wait and see what directions U.S. policy would take. And increased competition for international students in other countries, including students' homelands, may have proved more attractive. Many academics and employers worry about this change in a relatively important supply of scientists and engineers.

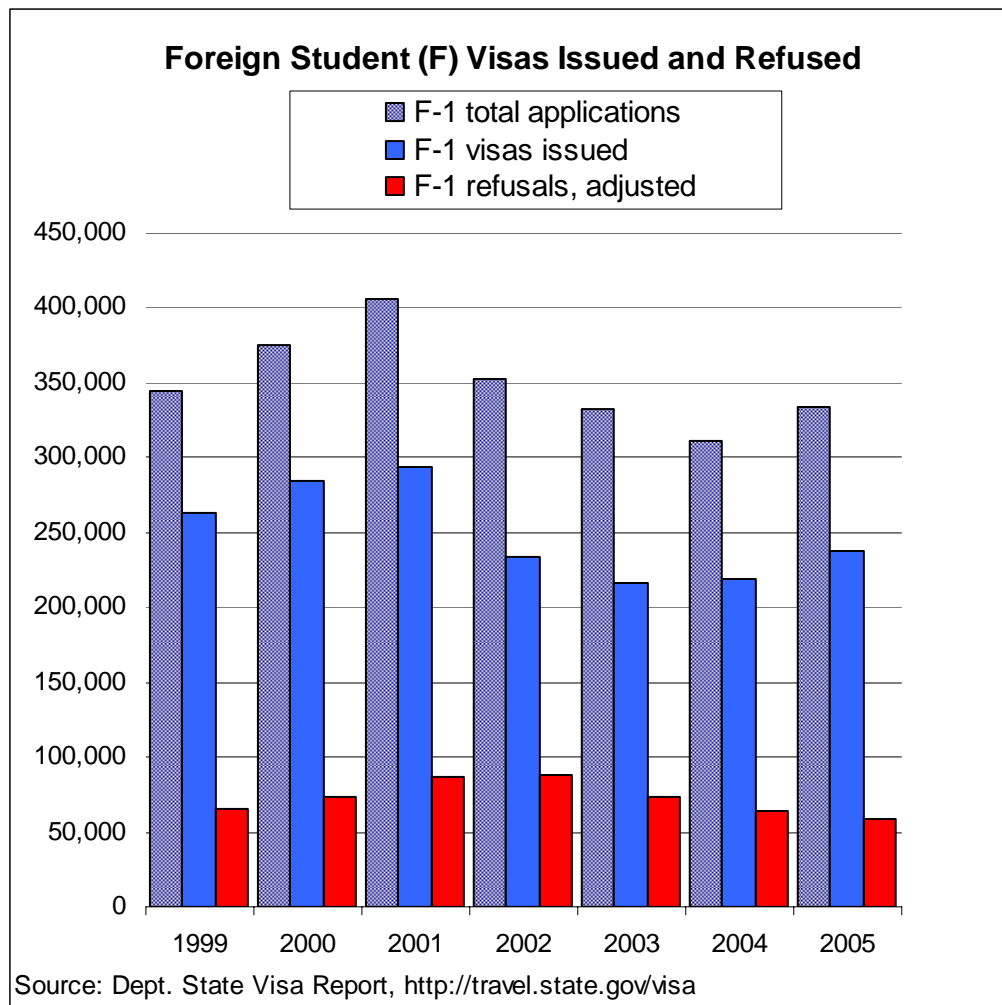
This Fact Brief presents the basic indicators on foreign students in the United States up through the academic year 2005. It draws on three major sources: U.S. Department of State data on foreign student visas, the Institute of International Education's (IIE) Open Door reports on foreign student enrollments, and the Council of Graduate Schools (CGS) surveys of graduate schools. Together, these data map the run up in foreign student numbers during the 1990s and the decline after 2001. The data clearly show a significant decline in student numbers in 2002, immediately following 9/11, then an ongoing deterioration in numbers for two more years, and then a small rebound in this 2005 academic year. Improved visa processing, efforts at outreach by U.S. universities, and changes in perceptions may be generating the rebound in the numbers. It is, however, premature to forecast a rebound to levels seen during the boom of the late 1990s.

Student Visas

The Department of State issues the "F-1" visa for foreign students to study in the United States. Data collected for visas are for a fiscal year that starts in October and include both undergraduate and graduate students. The number of all foreign student visas issued

increased by over one third during the 1990s to a peak of 320,000 in 2001, only to then drop one fifth in 2002 to 257,000. The number of visas then dropped again by 8 percent in 2003. However, in 2004 the number of visas issued increased by almost 1 percent and then by 8 percent in 2005. There have been other year-to-year declines in visa numbers, but the 5 percent decline 1997 to 1998 was no where near as large as the 2002 drop of 20 percent. On the other hand, yearly increases of 5 to 8 and even 10 percent (1997) have been common—visas were up 9 years but down only 4 years between 1992 and 2005.

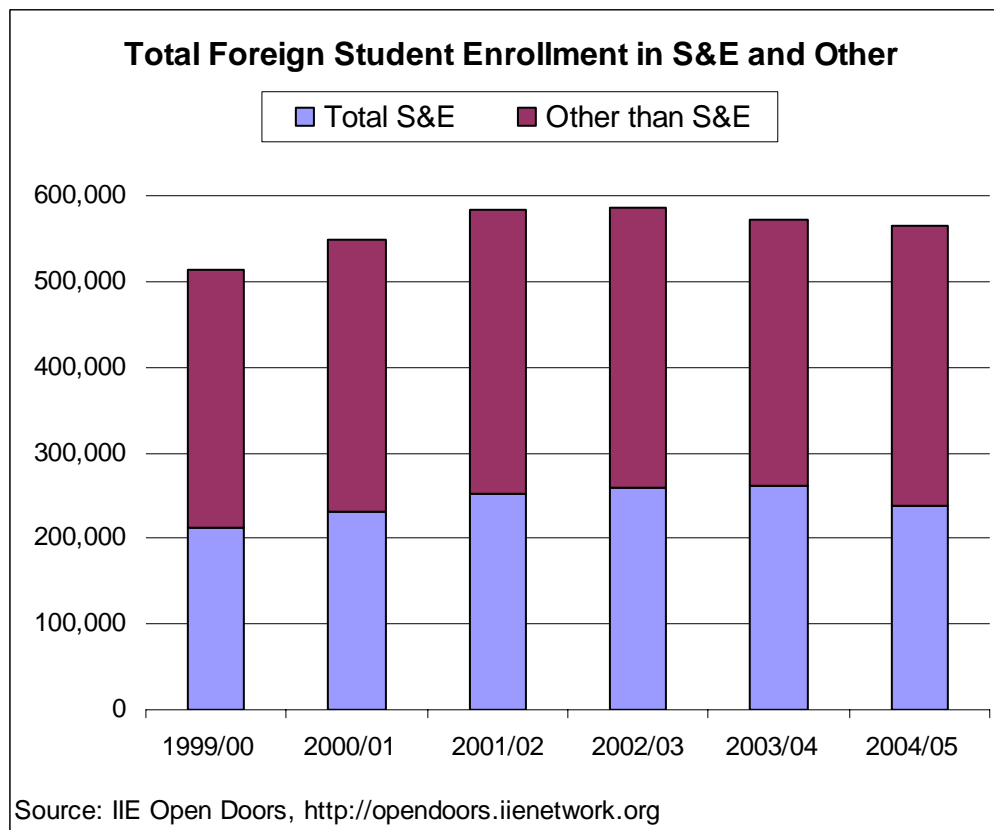




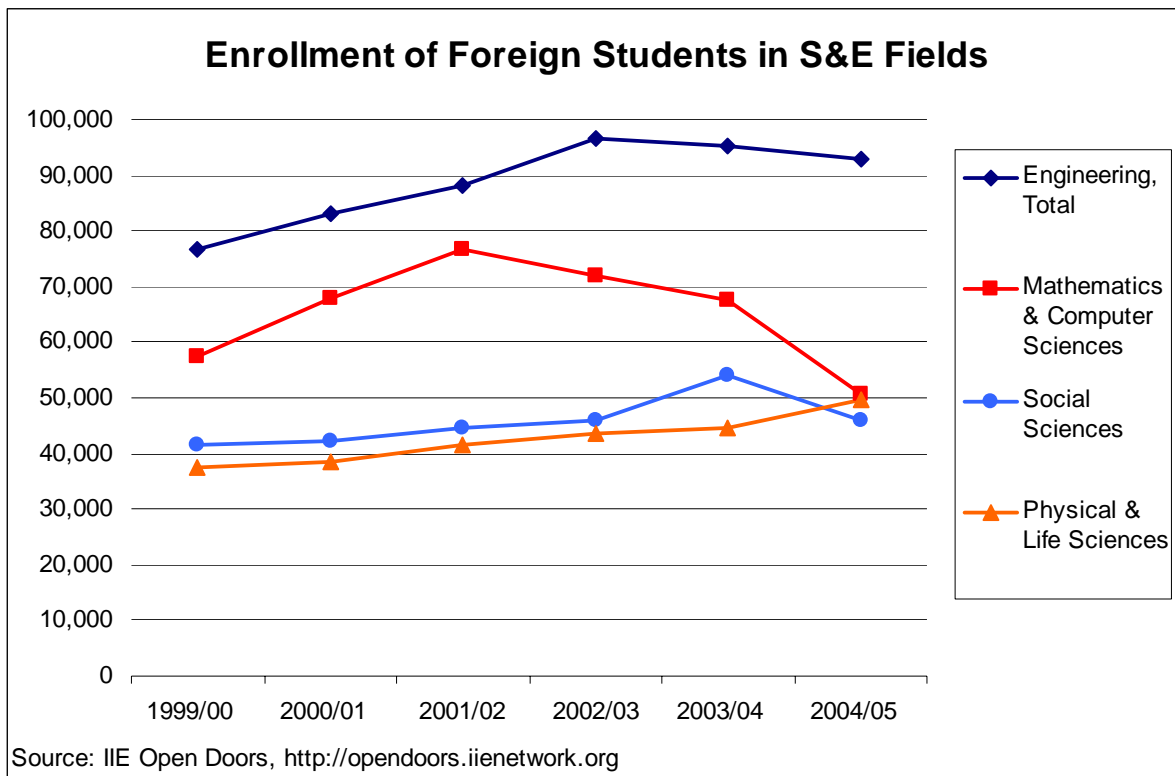
More detailed data tell us something about the admission process itself. A foreign student is issued a visa only after review by the State Department and their application may be refused. From 1999 to 2001 initial refusal rates averaged 25 percent and then jumped to 34 percent in 2002 and 2003. But by 2004 and 2005 the average refusal rate dropped to 29 percent and shows indications of returning closer to the pre-9/11 baseline. Some of the initial visa refusals are reconsidered and the actual refusal rate adjusted for such waivers averaged 20 percent 1999 to 2001, peaked at 25 percent in 2002, and in 2005 was 18 percent. In line with this, after three years of decline, the number of applications for student visas increased 7 percent in 2005.

STUDENT ENROLLMENT

The IIE numbers include the total number of foreign students enrolled in U.S. institutions after their admission and during all years that they are pursuing their studies. Enrollment numbers do not fluctuate much year-to-year because they include both newly admitted and long-term students. Indeed, the total number of enrolled foreign students in U.S. institutions increased through 2001 and then leveled off in academic year 2002, growing just over one-half of 1 percent in that year. Thereafter, total foreign student enrollments declined 2.4 and 1.3 percent in academic years 2003 and 2004.

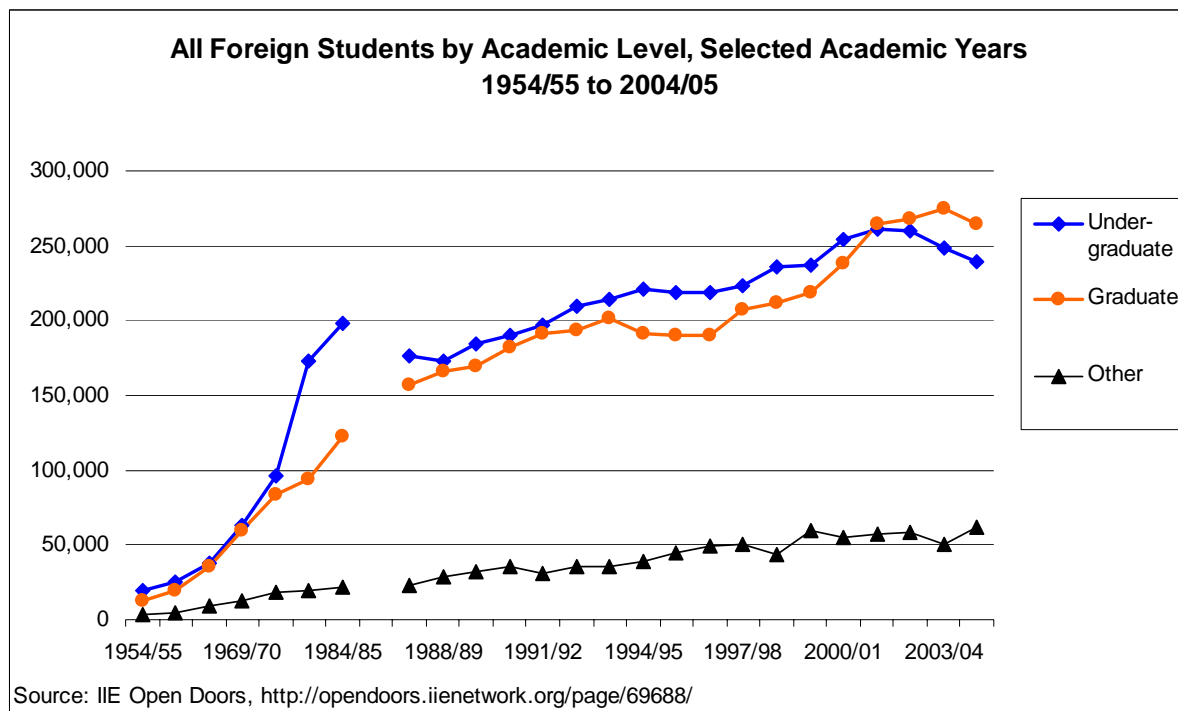


The number of foreign students in the combined science and engineering fields also changes little until academic year 2004 when it declined 8 percent from the previous year. But total and combined S&E enrollments do not tell the entire story, because they include long-term students and because there can be substantial changes by subfield.



Looking within science and engineering fields shows more significant changes in foreign student enrollment. Obviously, foreign student enrollments in mathematics and computer sciences declined substantially after 2001. The number of students enrolled in this field dropped about 6 percent each academic year 2002 and 2003; and then a further 25 percent in 2004. In contrast, the number of foreign students enrolled in engineering actually increased 10 percent in 2002 and has declined only moderately since. Foreign student enrollment in the social sciences stayed stable until 2003 when the numbers increased 18 percent only to then decline 15 percent in 2004. Foreign student enrollment in physical and life sciences increased throughout with an 11 percent upward bump in 2004.

Because most students stay enrolled until they have completed their degree, it is perhaps not surprising that combined enrollments in the science and engineering fields did not change much. The exception is mathematics and computer sciences which experienced a dramatic decrease in foreign student enrollment. It is not known whether or not already-enrolled foreign students discontinued their studies, perhaps shifting into other fields or leaving the country altogether. However, it is possible that this field of study was disproportionately affected by the “dot.com” bust and a steep drop in demand for information technology workers, coincident with the reinstatement of a low cap on the temporary specialty (H-1B) visas to which many foreign students had transitioned after graduation.



Thus far, the data has combined foreign undergraduate and graduate students. Distinguishing enrollments by level of study, for all foreign students, show the same basic trends. There is significant growth in the number of all foreign students since the 1950s and year-to-year since 1988 there has been a general increase until 2002 when foreign undergraduate enrollments began to drop. However, there was no decline in graduate enrollments until the 2004 academic year. Perhaps this was because the lengthy course of study for many graduate degrees which may have kept enrollment numbers high even if new first-time students declined. At any rate, this time series shows in another way that total enrollment numbers, across all fields, did not drop as soon or as much as did the foreign student (F) visas admissions numbers. At the same time, note that graduate student enrollments have dropped previously in 1994 and 1995, not recovering until 1997. This data series is not a simple story of up and up.

But much of the concern with foreign enrollment focuses on graduate students and, as we have seen, there can be more to the story if we look at finer levels of detail. While foreign undergraduates make up a substantial share of enrollments leading to baccalaureate degrees, foreign graduates have become the most significant players. Foreign graduate students are 50 percent of graduate enrollments in engineering and 41 percent of enrollments in the physical sciences. They are 26 percent of graduate enrollments in the biological sciences and 17 percent in the social sciences (2004, Counsel of Graduate Schools, <http://www.cgsnet.org/pdf/GED2004Rep.pdf>).

Percent Change Fall to Fall of Applications, Admits and Enrollment of International Students

	Applica- tions	Admits	First-time enrollment	Total Enrollment
<u>Change Fall 2004 to 2005</u>				
Total, All Fields	-5%	3%	1%	-3%
Engineering	-7%	3%	3%	-6%
Life Sciences	-2%	-2%	-1%	-5%
Physical Sciences	-2%	8%	1%	-1%
Social Sciences	-2%	-1%	-2%	-4%
<u>Change Fall 2003 to 2004</u>				
Total, All Fields	-28%	-18%	-6	na
Engineering	-36%	-24%	-8	na
LifeScience/Agriculture	-24%	-19%	-10	na
Physical Science/EarthScience	-22%	-17%	6	na
Social Science	-20%	-13%	na	na

Sources: Council of Graduate Schools, various reports on survey project:
<http://www.cgsnet.org/VirtualCenterResearch/policyanalyses.htm>
<http://www.cgsnet.org/pdf/CGSFall2004EnrollmentSurveyPR.pdf>
http://www.cgsnet.org/pdf/CGS2005IntlAdmitIII_Rep.pdf
<http://www.cgsnet.org/pdf/CGSIntGradReportII2005.pdf>

The Council of Graduate Schools has fielded surveys of their member graduate schools in an effort to track the leading indicators of changes in enrollment. Of course, foreign students must first apply for admission to US institutions and these data capture changes in the level of intent. There was a significant decline in foreign student applications to US colleges from academic year 2003 to 2004 — a 28 percent drop for all fields. Engineering saw a 36 percent drop in applications at that time. Yet, admissions from the pool of applicants dropped 18 percent and the number of first-time foreign enrollees dropped 6 percent. So while the precipitous decline in applications warranted significant attention, the ultimate decline of those admitted and then who went on to enroll was much less.

In the most recent survey in Fall of 2005, the CSG numbers show a decline in applications of just 5 percent for all foreign students. Engineering registered a 7 percent decline in applications, while the sciences registered just 2 percent decline. Simultaneously, admissions are little changed in all fields and all first-time enrollments are up 1 percent (partly due to higher rates of admission). First-time enrollment in engineering is up 3 percent despite the drop in applications. Once again, we see that total enrollment numbers, including long-term students, remain down. So these graduate student data show the same rebound in new foreign student numbers that other data show, as well as suggesting the same likelihood that foreign enrollments have some ways to go if they are to return to pre-9/11 levels.